NOPSEMA

Annual offshore performance report

to 31 December 2016

PREFACE

Welcome to the *Annual Offshore Performance Report* published by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA). This report contains data gathered through NOPSEMA's regulatory functions covering occupational health and safety, well (structural) integrity and environmental management of offshore petroleum facilities and activities in Commonwealth waters (and coastal waters where functions had been conferred) to 31 December 2016.

Copies of this report are available to download at nopsema.gov.au or by contacting:

NOPSEMA Communications

GPO Box 2568
Perth WA 6001

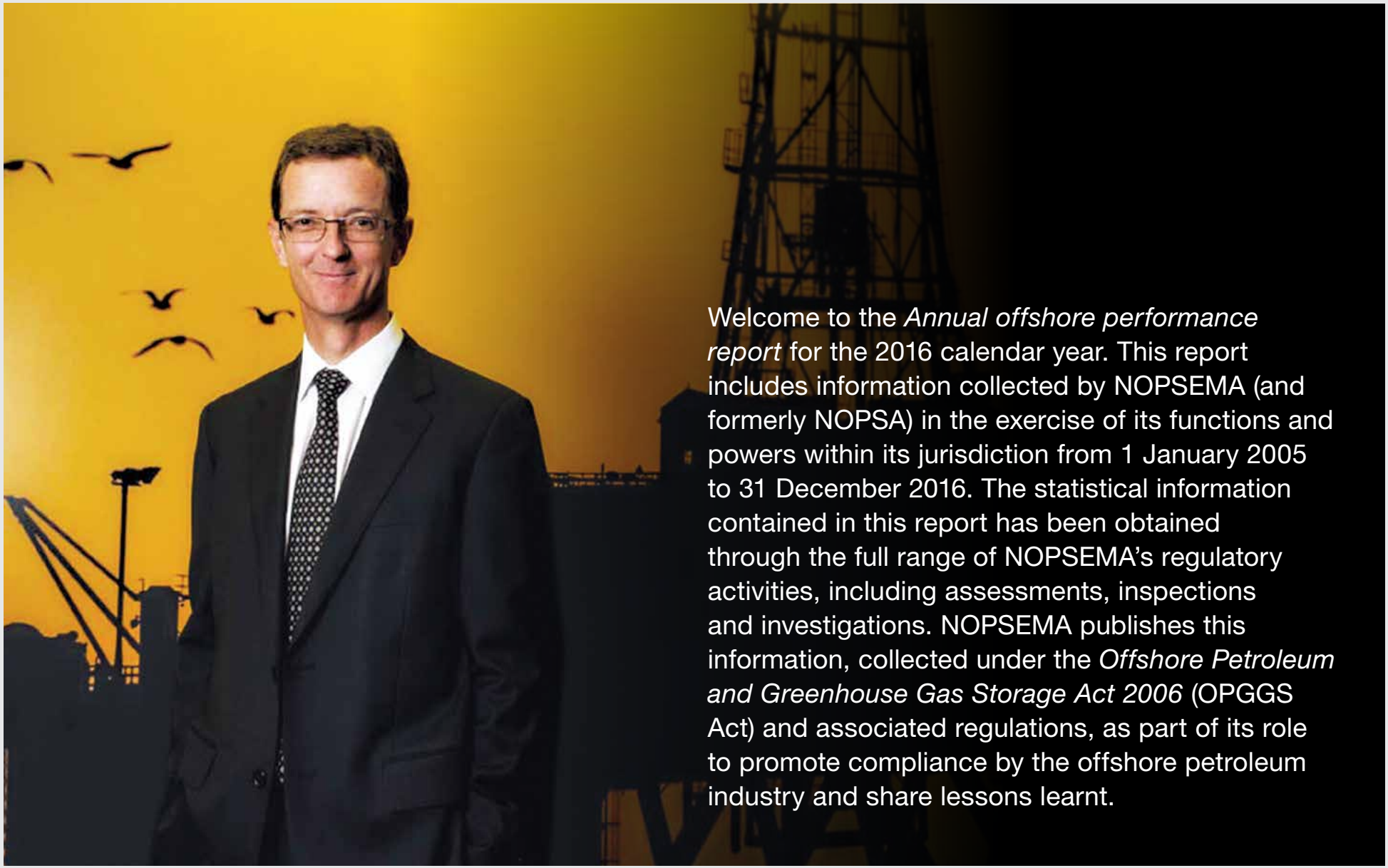
phone: +61 8 6188 8700
email: communications@nopsema.gov.au

This report contains data gathered through the exercise of NOPSEMA's regulatory powers and functions in Commonwealth waters (and coastal waters where powers and functions have been conferred) under the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*. The report is intended to provide general information only and its contents should not be relied on as advice on the law, nor treated as a substitute for professional advice. Every effort has been made to ensure the accuracy of the material contained in the report.

NOPSEMA, on behalf of the Commonwealth disclaims to the extent permitted by law, all liability (including negligence) for claims of losses, expenses, damages and costs that may be incurred as a result of information in this report. Reference to the Commonwealth includes a reference to any contractor, agent or employee of the Commonwealth.

CONTENTS

MESSAGE FROM THE CHIEF EXECUTIVE OFFICER



Welcome to the *Annual offshore performance report* for the 2016 calendar year. This report includes information collected by NOPSEMA (and formerly NOPSA) in the exercise of its functions and powers within its jurisdiction from 1 January 2005 to 31 December 2016. The statistical information contained in this report has been obtained through the full range of NOPSEMA's regulatory activities, including assessments, inspections and investigations. NOPSEMA publishes this information, collected under the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (OPGGS Act) and associated regulations, as part of its role to promote compliance by the offshore petroleum industry and share lessons learnt.

Message from the chief executive officer

This year's report continues our focus on sharing key findings from NOPSEMA's inspections and other activities. These findings provide valuable insights into industry performance and identify specific areas for improvement. Included in Chapter 5 are detailed analyses of key NOPSEMA findings from occupational health and safety inspections covering loss of containment, dropped objects and diving systems, and environmental management inspections examining the management of planned discharges.

Despite another challenging year of falling oil and gas prices, it was encouraging to see improvement in many safety indicators. There were no fatalities or major injuries reported in 2016, which is the first time there have been no major injuries reported for a full year since the inception of NOPSA in 2005. Accident rates continued the downward trend observed since 2010 and the total number of injuries also decreased. Measures for process safety were less definitive with hydrocarbon releases increasing while dangerous occurrences decreased overall. From 2015 to 2016, there was a 28% increase in the total number of hydrocarbon releases reported to NOPSEMA. The majority of these releases were in the lower releases category (> 1-300 kg), but any uncontrolled hydrocarbon release warrant attention due to the risk of ignition and the potential widespread damage and associated threat to lives they could cause. Conversely, the number of dangerous occurrences reported fell by 17% with the majority relating to unplanned events. Analysis indicates that the vast majority of dangerous occurrences which required the implementation of emergency response plans were the result of false alarms or inadvertent manual call point activation due to human activities. These causes may provide reassurance to some, but NOPSEMA is concerned about the frequency of the occurrences and the risk of workforce complacency.

A proposal in 2016 to undertake exploration drilling in the Great Australian Bight divided opinion with support from some community groups and strong opposition from others. The proposal attracted environmental campaigns, increased media scrutiny and parliamentary inquiries. While the increased scrutiny related to a particular proposal and region, it reflected changing community expectations for consultation, engagement and transparency by the industry. These changing expectations place an onus on the regulator and industry to respond with actions that ensure maintenance of our social license to operate.

Among the factors that influence community acceptance of offshore oil and gas activity is the quality of the industry oil spill risk management arrangements. In 2016 NOPSEMA inspectors conducted a focused inspection program of seven titleholders with regard to oil spill risk management and visited the Australian Marine Oil Spill Centre (AMOSC) premises in Victoria and Western Australia. These targeted inspections supplemented the usual NOPSEMA inspection program and verified titleholder oil spill preparedness and response capabilities. The results of the inspections were encouraging. Areas for improvement were also identified that are applicable to all titleholders operating in Australian waters. NOPSEMA recognises and supports the industry's cooperative approaches to oil spill risk management as they provide oil spill risk reduction measures not possible on a single titleholder or activity basis. NOPSEMA also sees scope for the industry to continue expanding these cooperative efforts so oil spill risks are managed to as low as reasonably practicable.

Stuart Smith
CEO - NOPSEMA

There were no fatalities or major injuries reported in 2016, which is the first time there have been no major injuries reported for a full year since the inception of NOPSA in 2005.

KEY HIGHLIGHTS

1 January 2016 to 31 December 2016:

Industry performance

Total offshore hours worked

9.7 million hours in 2016, a decrease of 38% from the 15.7 million in 2015. In 2016, 65% of the hours worked occurred on fixed facilities and 35% on mobile facilities.

Facilities

- 20 mobile facilities (MODUs and vessels), a decrease from 29 in 2015.
- 129 fixed facilities (pipelines, FPSOs, normally attended platforms and not normally attended platforms), an increase from 119 in 2015.

Offshore hours reported by mobile facilities decreased 65% from 9.8 million hours in 2015 to 3.4 million in 2016.

Submissions to NOPSEMA

161 submissions of key permissioning documents were made by duty holders to NOPSEMA in 2016, a 14% decrease on the 187 submitted in 2015. These submissions included:

- 76 safety cases and DSMSs
- 45 WOMPs
- 32 environment plans and OPPs
- 8 PSZ applications.

For details of the other assessments submitted to NOPSEMA refer to Appendix 4.

NO Fatalities or serious injuries

No fatalities or serious injuries were reported to NOPSEMA in 2016.

This is first time since NOPSEMA's inception in 2005 that there were no serious injuries reported.

0

Injuries

52 injuries were reported on offshore facilities in 2016, a 41% decrease on the 88 injuries reported in 2015.

This is the lowest number of injuries reported in a single year since 2005.

Accidents

4 accidents (resulting in incapacitation >= 3 days LTI) were reported in 2016, down from 12 in 2015.

Dangerous occurrences

302 dangerous occurrences were reported, which is lower than the 5 year average of 351.

OHS hydrocarbon releases

28% increase from 18 in 2015 to 23 in 2016.

Environmental reportable incident notifications

38% decrease from 13 in 2015 to 8 in 2016.

Complaints

Two complaints were received by NOPSEMA in 2016.

Key highlights

NOPSEMA activity

100% Submissions notified on time

100% of submissions made to NOPSEMA in 2016 across all divisions were notified within legislated timeframes (time from submission to first notification).

100%

Average assessment time

- Safety case average assessment time in 2016 was comparable to previous years
- WOMP average assessment time increased
- Environment plan average assessment time increased.

Assessment time is often dependent on the duty holder providing timely responses to requests for information, and it should also be noted that new well regulations came into effect in 2016 which required duty holders to resubmit their WOMPs in accordance with new content requirements.

Inspections

143 inspections were undertaken in 2016, a 27% decrease on the 195 inspections in 2015. Inspections in 2016 included:

- 6 well integrity (50% decrease compared to 12 in 2015)
- 93 occupational health and safety (18% decrease compared to 114 in 2015)
- 44 environmental management (36% decrease compared to 69 in 2015).

The reduction in inspections reflects the industry wide reduction in activity in 2016.

Major investigations

No reported incidents (accidents, dangerous occurrences or reportable environmental incidents) warranted a major investigation by NOPSEMA in 2016.

0

Enforcement actions

10 enforcement actions were issued to 6 duty holders in 2016. This was a reflection of reduced industry activity.

INTRODUCTION

This report provides information regarding NOPSEMA activities and the activities of the offshore petroleum industry.

The report also provides a high level summary of:

- submissions received and assessed by NOPSEMA
- industry activity and incidents
- NOPSEMA's compliance and enforcement activities.

NOPSEMA uses intelligence gathered through fulfilment of its regulatory functions to inform the assessment of submissions. For example, information gained from NOPSEMA inspections and investigations may be used to inform an assessment. Similarly, the outcomes of assessment may contribute to the development of NOPSEMA's ongoing inspections of duty holder's compliance with the regulations. For more information about assessments and regulatory documents, see the 'Safety', 'Well integrity' and 'Environmental management' pages at nopsema.gov.au.

Data quality

NOPSEMA has made every endeavour to ensure the data included in this report is accurate at the time of publication. Both the subjective nature of qualitative data and legislative amendments may have influenced the results. Data may vary as further information becomes available and any significant variations are noted accordingly within the document. Both numbers and rates are variously discussed throughout this report to provide clarity. 'Rates per million hours worked' is an industry standard, and is calculated by dividing the total number against the total reported hours worked offshore and standardising to one million hours. Applying this standard allows better comparison between operators and facilities and over time allows for the identification of trends.

Percentages are used in selected charts and data tables to assist with comparisons over time and to highlight proportions. Totals may not always equal 100% due to rounding (decimal points) or because not all categories may be included in the topic under discussion (e.g. often only the top five or six categories of interest are discussed to maintain brevity). Brief accompanying text is provided for charts and tables to assist in conveying the statistical information presented in this report. NOPSEMA cautions against extrapolation of the data.

More publications

NOPSEMA publishes its corporate plan, annual report, industry performance data, guidance on NOPSEMA's approach to administering the legislation, safety alerts and other publications and reports at nopsema.gov.au.

Background

NOPSEMA is Australia's independent regulator of health and safety, well integrity and environmental management for the offshore petroleum and greenhouse gas storage industries. NOPSEMA's role includes:

- working with the industry, workforce, stakeholders and other authorities to ensure the offshore petroleum and greenhouse gas storage industries properly control all health and safety, integrity and environmental risks
- independently administering offshore petroleum safety, well integrity and environmental management legislation
- promoting a legislative framework that encourages continuous improvement of health and safety, well integrity and environmental performance of the offshore petroleum and greenhouse gas storage industries
- developing its people, processes and systems to deliver efficient and effective regulation.

Vision, purpose and values

Vision

Safe and environmentally responsible Australian offshore petroleum and greenhouse gas storage industries.

Purpose

To independently and professionally regulate offshore safety, well integrity and environmental management.

Values

Professionalism – we will be accountable, consistent, reasonable and act in accordance with the law.

Ethics – we will demonstrate respect and integrity in all we do.

Impartiality – we will make our decisions on the merits of the circumstances.

Leadership – we will be proactive, inclusive and decisive in our conduct as a pre-eminent regulator.

Our jurisdiction

NOPSEMA's jurisdiction covers all offshore petroleum facilities and activities in Commonwealth waters, as well as designated coastal waters where regulatory functions have been conferred. Jurisdictions where powers to regulate are not conferred remain the responsibility of the relevant state or Northern Territory (NT). Currently Victoria has conferred occupational health and safety (OHS) and well integrity powers to NOPSEMA. The Joint Petroleum Development Area in the Timor Sea is regulated by the National Petroleum Authority (Autoridade Nacional do Petróleo) of Timor-Leste on behalf of the Government of Australia and the Government of Timor-Leste.

Jurisdiction for safety, well integrity and environmental management

Figure 1.

Note: State and Northern Territory coastal waters conform more or less to the Australian continent and associated islands. Commonwealth waters extend seaward from the edge of the three nautical mile limit of designated coastal waters, to the outer extent of the Australian Exclusive Economic Zone at 200 nautical miles.

Regulatory assessments

By law, offshore petroleum activities cannot commence before the duty holder has demonstrated to NOPSEMA's satisfaction that the relevant safety, well integrity and environmental management requirements will be met. This satisfaction is achieved through NOPSEMA's assessment of duty holders' documented submissions, which must demonstrate that risks to health and safety will be reduced to as low as reasonably practicable (ALARP), and impacts and risks to the environment will be reduced to ALARP and acceptable levels. The key risk management regulatory documents submitted by duty holders to NOPSEMA are:

- **safety case** – covering an operator's assessment and management of health and safety risks
- **well operations management plan (WOMP)** – covering a titleholder's management of risk to well integrity
- **environment plan** – covering a titleholder's management of impacts and risks to the environment.

NOPSEMA makes regulatory decisions according to the relevant legislation, NOPSEMA's published regulatory policies and management processes.

Objective based regulation is recognised internationally by regulatory authorities, risk management professionals and academics as being the most appropriate regulatory framework for high hazard industries.

Objective based regulation – responsibility rests with duty holders (operators, titleholders, equipment suppliers and the workforce)

The Australian offshore petroleum and greenhouse gas storage regulatory regime is objective based. Under an objective based regime general duties are imposed on parties to the regime, especially operators, titleholders and their employees. The principle underlying the regime is: the primary responsibility for ensuring health and safety and the protection of the environment lies with those who create risks and those who work with them. That is because these parties have the necessary detailed knowledge, decision-making authority and resources to ensure the management of the risks they create in compliance with the duties imposed by the regime. Objective based regulation:

- ensures that those who create risks are responsible for identifying and managing those risks
- is adaptable, flexible and scalable to the particular circumstances of individual activities and the environments in which they take place
- provides the opportunity for the offshore industry to adopt advances in technology and apply control measures that are best suited to the individual circumstances of the activity
- encourages adoption of best practice management systems and continuous improvement in all aspects of duty holder performance
- is recognised internationally by regulatory authorities, risk management professionals and academics as being the most appropriate regulatory framework for high hazard industries.

Ongoing compliance monitoring

NOPSEMA monitors duty holders' compliance with the duties imposed by the legislation and monitors their ongoing implementation, and compliance with, the relevant safety, well integrity and environmental management regulatory documents. Where non-compliance is identified NOPSEMA will, where appropriate, take enforcement action to ensure a return to compliance.

1. INDUSTRY ACTIVITY

NOPSEMA collects data relating to offshore petroleum activity via industry reports and submissions received, supplemented with other information. The total number of hours reported to have been worked offshore in 2016 was 9.7 million hours, a 38% decrease on the 15.7 million hours reported in 2015. This decrease can largely be attributed to a number of mobile facilities leaving the regime during the year, resulting in a 65% decrease in reported mobile offshore hours (discussed later in this section).

NOPSEMA refers collectively to the parties with legislated responsibilities under the OPGGS Act as 'dutyholders'. An offshore petroleum dutyholder making submissions to NOPSEMA may be:

An operator of a facility:	A titleholder:
The organisation responsible for the day-to-day management and control of a facility and its activities.	The organisation that holds rights conferred by an eligible petroleum title.
Operators are responsible for making safety case submissions under OHS related legislation.[1]	Titleholders are eligible to make submissions under environment management and well operations related legislation.

1 Other parties also make submissions under OHS legislation, for example, diving operators (diving safety management system).

During 2016...

Industry activity

NOPSEMA reports offshore petroleum industry activity based on regulatory divisions:

Division	Occupational Health And Safety (OHS)	Environmental Management (EM)	Well Integrity (WI)
Dutyholder	**Operators**	**Titleholders**	**Titleholders**
Regulated entity	**Facilities** Include: platforms, floating production, storage and offloading vessels (FPSOs), mobile offshore drilling units (MODUs), vessels, pipelines.	**Petroleum activities** Include: surveys (seismic and other), drilling, construction, operation, decommissioning.	**Titles and wells**
How activity is reported	All operators of facilities submit a monthly report which contains the number of hours worked when in the regime and undertaking petroleum activities. These indicate OHS activity levels.	Permissioning documents that identify petroleum activities are submitted. In combination with levy information, these indicate EM activity levels.	Permissioning documents are submitted when well activities are proposed on titles and wells. In combination with levy information, these indicate well integrity activity levels.
			
	For more information about NOPSEMA's occupational health and safety regulatory functions, see the 'Safety resources' page at nopsema.gov.au.	For more information about NOPSEMA's environmental management regulatory functions, see the 'Environmental resources' page at nopsema.gov.au.	For more information about NOPSEMA's well integrity regulatory functions, see the 'Well integrity resources' page at nopsema.gov.au.

1.1 Number of duty holders and regulated entities

Active facility operators (OHS)

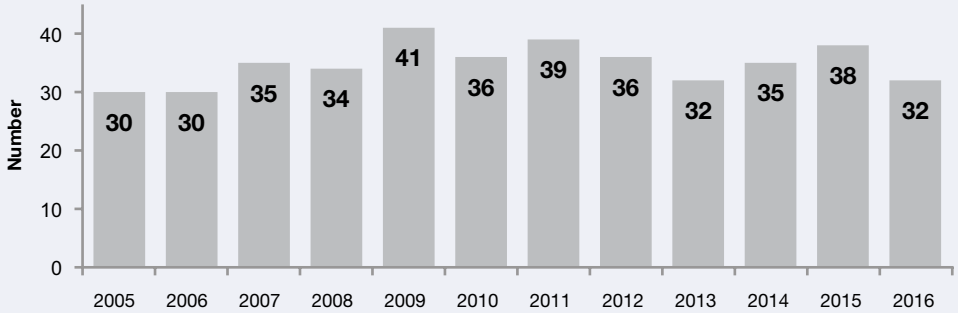


Figure 2.

The number of active[2] facility operators decreased from 38 in 2015 to 32 in 2016.

2 Facility operators are classified as 'active' based on their submission to NOPSEMA of one or more monthly injury summary reports during a reporting period. Facility operators classified as 'inactive' may be registered with NOPSEMA, but not undertaking offshore petroleum activity in NOPSEMA's jurisdiction in a given period.

There were 149[3] active facilities in 2016.

Active facility types	2016	%
Pipelines	85	57%
Vessels – accommodation, construction, pipelay, multi-service	12	8%
Platform – normally attended production platforms (NA)	17	11%
FPSO/FSOs - floating (production) storage and offloading facilities	10	7%
MODUs - mobile offshore drilling units	8	6%
Platform – not normally attended platforms (NNA)	17	11%
Total	**149**	**100%**

Table 1.

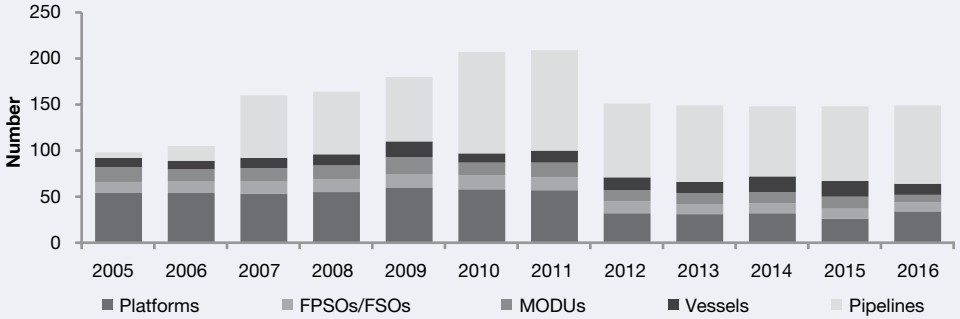
3 Platforms and pipelines are classified as 'active' if they are on NOPSEMA's operator register and have an accepted safety case in force; however not all facilities may be actively engaged in hydrocarbon production in a given year. Out of the 34 platforms in 2016, it is estimated that 27 (79%) are engaged in hydrocarbon production; of the 85 pipelines it is estimated that 65 (76%) currently have hydrocarbons flowing through them.

Industry activity

Facility types

NOPSEMA also groups facilities as fixed or mobile. Fixed includes platforms, pipelines and FPSO/FSOs. Mobile facilities are MODUs and vessels only.

Facility Type



Note: a number of facilities reverted back to state jurisdiction in 2012

Figure 3.

The number and location of facilities fluctuates as mobile facilities enter and depart the jurisdiction, or when functions are conferred on NOPSEMA to regulate in designated state and Northern Territory coastal waters.

Total hours worked offshore

In 2016, 65% of the hours worked occurred on fixed facilities and 35% on mobile facilities. This is a noticeable reversal from the previous year (37% fixed and 63% mobile), and the first time since 2012 where there has been a higher proportion of hours reported by fixed rather than mobile facilities. As seen in figure 4, a number of mobile facilities left the jurisdiction from 2015 to 2016 – actively reporting MODU numbers decreased from 11 to 8, and vessel numbers from 17 to 12.

Total offshore hours worked

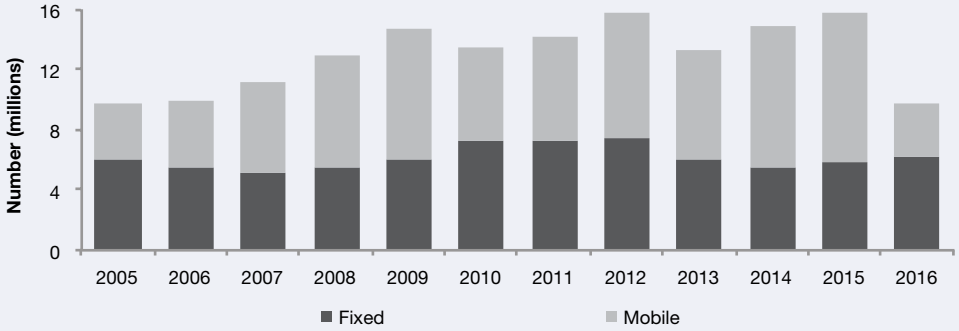


Figure 4.

Fixed facilities by nearest state – 2016

Note: This map does not include mobile facilities such as MODUs and vessels undertaking petroleum activity.

Fixed facilities by nearest state – 2016

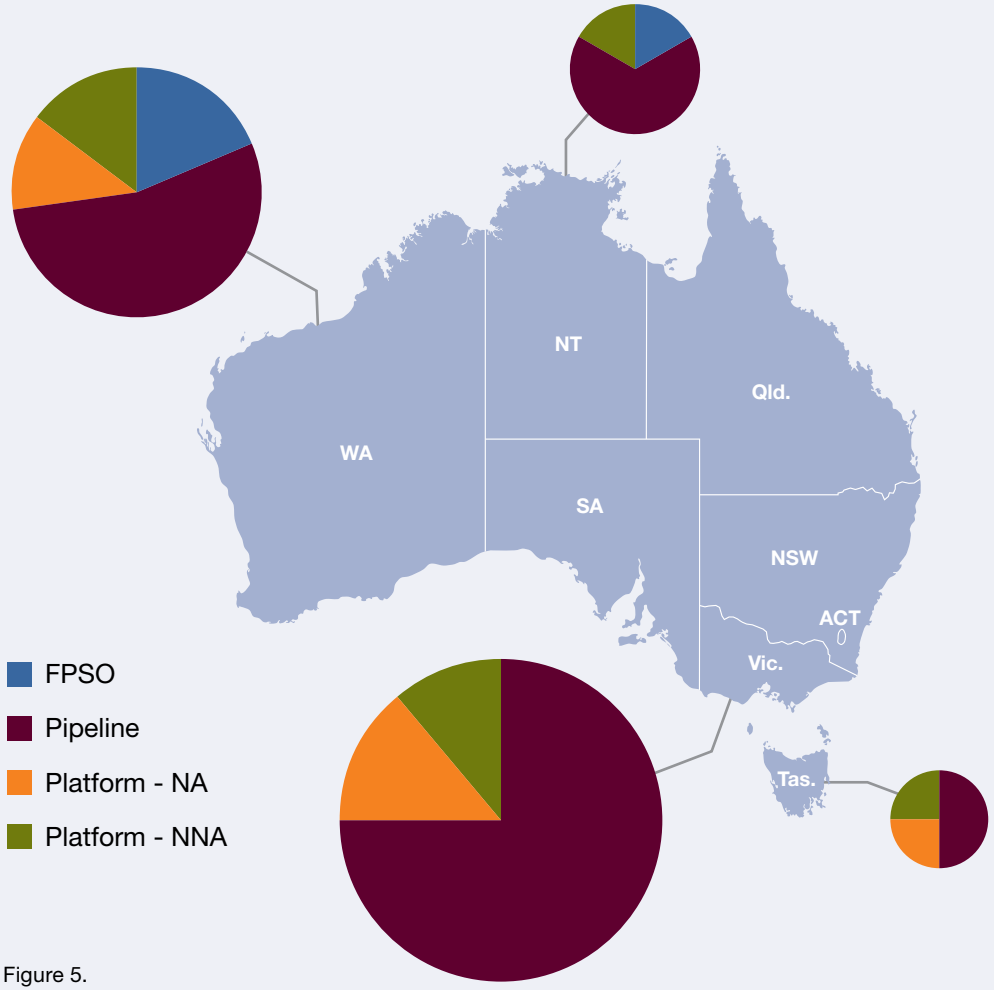


Figure 5.

Fixed facilities by nearest state – 2016

State	Facility Type	Total	%
Vic.	Pipeline	53	74.6%
	Platform - NA	10	14.1%
	Platform - NNA	8	11.3%
	Vic. total	**71**	**55.0%**
WA	FPSO	9	18.8%
	Pipeline	26	54.2%
	Platform - NA	6	12.5%
	Platform - NNA	7	14.6%
	WA total	**48**	**37.2%**
NT	FPSO	1	16.7%
	Pipeline	4	66.7%
	Platform - NNA	1	16.7%
	NT total	**6**	**4.7%**
Tas.	Pipeline	2	50.0%
	Platform - NA	1	25.0%
	Platform - NNA	1	25.0%
	Tas. total	**4**	**3.1%**
Grand total		**129**[4]	**100.0%**

Table 2.

4 In 2016 there were 8 active MODUs and 12 active vessels that are not included on figure 5.

Industry activity

Seismic survey activity by nearest state – 2016

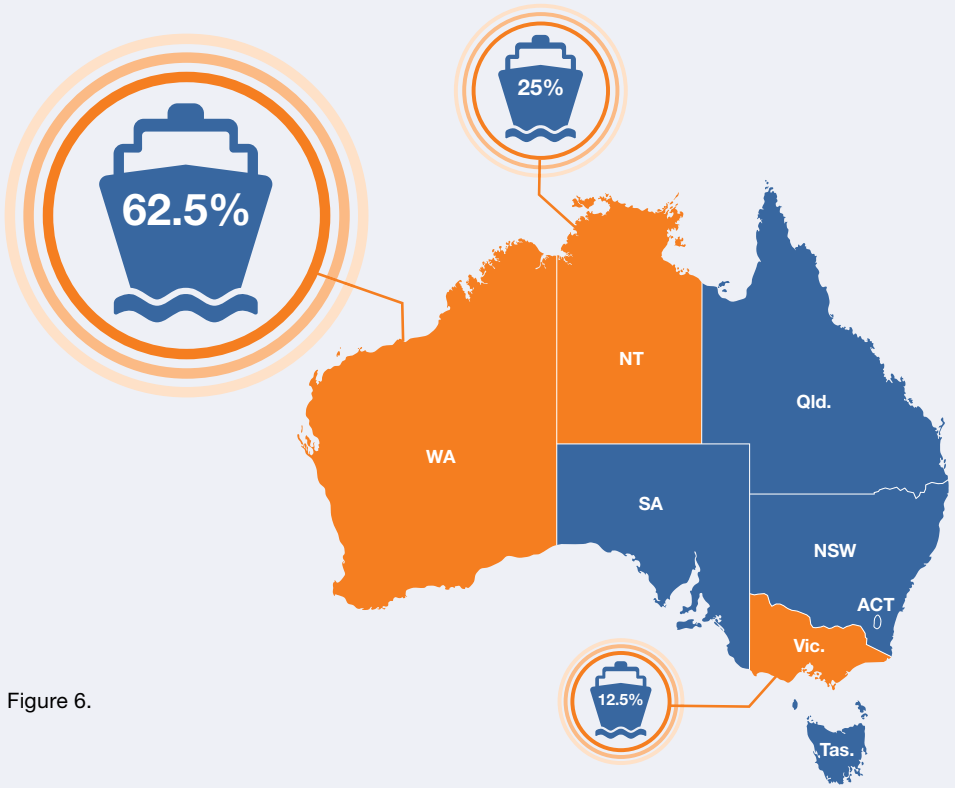


Figure 6.

Seismic survey activity by nearest state – 2016

State	Total	%
WA	5	62.5%
NT	2	25%
Vic.	1	12.5%
Grand total	**8**	**100%**

Table 3.

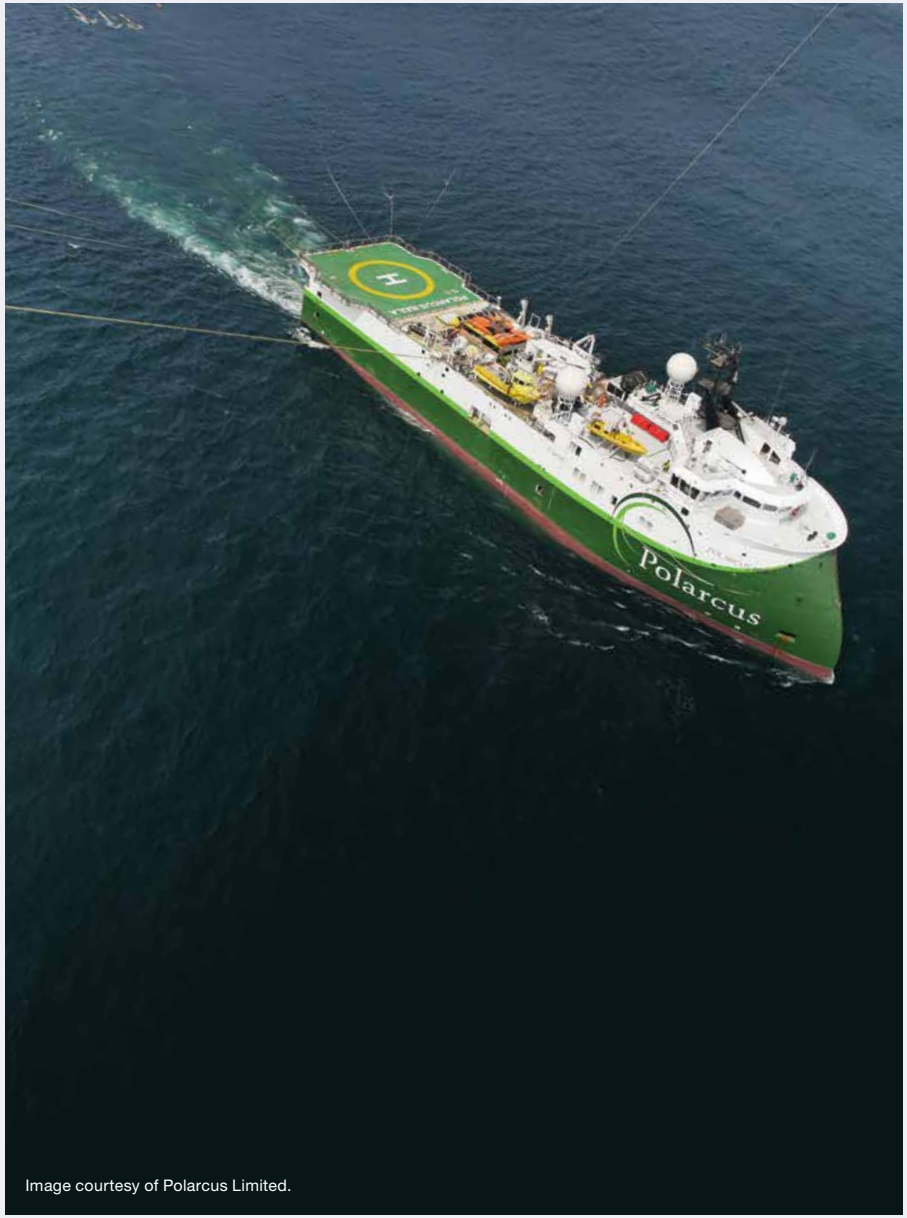


Image courtesy of Polarcus Limited.

1.2 Eligible wells

In 2016 there were 885 eligible wells[5] under NOPSEMA's jurisdiction. The number of titleholders with eligible wells decreased from 23 to 22 in 2016.

Titleholders of eligible wells (WI)

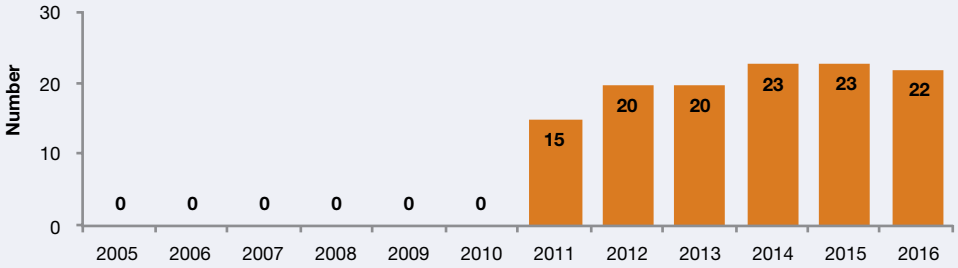


Figure 7.

Eligible wells (WI)

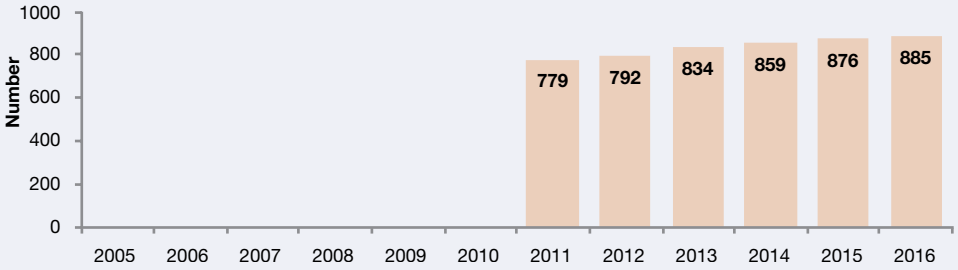


Figure 8.

Number of wells declared as at 31 December each year, which are billed as at 1 January the following year:

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Number of eligible wells	-	-	-	-	-	-	779	792	834	859	876	885
Number of titleholders	-	-	-	-	-	-	15	20	20	23	23	22

Table 4.

5 An 'eligible well' is any well that has been drilled within a title area but not permanently abandoned. Eligible wells require continued regulatory oversight and titleholders must ensure that all their eligible wells are covered by an in force WOMP. An abandoned well is a well that has been made permanently safe and requires no further regulatory scrutiny for well integrity scrutiny (but may have ongoing environmental management obligations).

2. ASSESSMENT AND SUBMISSIONS

NOPSEMA's dedicated assessment teams, staffed by highly trained and qualified technical experts, apply robust, thorough and consistent processes to all duty holders and assessments to ensure the protection of Australia's offshore workforce and environment. Under NOPSEMA's jurisdiction, no petroleum activity can commence without NOPSEMA first 'accepting' the regulatory submission relating to the facility, well activity or petroleum activity. The key submission types assessed by NOPSEMA include:

Assessment and submissions

Assessment and submissions

Occupational health and safety (OHS)

Safety case (SC)

Is a document submitted by the operator of a facility which:

- identifies hazards and risks to the health and safety of people
- describes how the risks are managed
- describes the safety management system in place to ensure the controls are effectively and consistently applied.

NOPSEMA assesses each safety case against the requirements in the Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009 (Safety Regulations). For more information see the 'Safety case' page at nopsema.gov.au.

Scope of validation (SoV)

The operator and NOPSEMA must agree the scope of validation before an operator can submit a safety case (or a revised safety case associated with a modification or decommissioning). The SoV relates to the design, construction and installation of the facility or to significant modifications to the facility and not the activities undertaken at the facility or the procedures that manage those activities. For more information see the 'Validation' page at nopsema.gov.au.

Environmental management (EM)

Environment plan (EP)

Is a document submitted by the titleholder or applicant which:

- identifies and evaluates impacts and risks to the environment associated with a petroleum activity
- describes how the environmental impacts and risks are to be controlled to ensure they will be of an acceptable level and reduced to ALARP
- describes the environment management system in place to ensure the controls are effectively and consistently applied
- demonstrates that appropriate consultation has and will continue to be undertaken by the titleholder.

NOPSEMA assesses each environment plan against the requirements of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (Environment Regulations). For more information see the 'Environment assessment' process page at nopsema.gov.au.

Well integrity (WI)

Well operations management plan (WOMP)

Is a document submitted by a titleholder that must identify the technical and managerial aspects of managing the risks to well integrity of the wells covered by the WOMP.

NOPSEMA assesses each WOMP against the requirements in Part 5 of the Offshore Petroleum and Greenhouse Gas Storage (Resource Management and Administration) Regulations 2011 (Wells Regulations). For more information see the 'Well integrity' page at nopsema.gov.au.

Table 5.

For more information on NOPSEMA's assessment approach, see the 'NOPSEMA Assessment Policy' at nopsema.gov.au.

Assessment and submissions

Other regulatory submissions provided for under the OPGGS Act regime include:

Assessment and submissions

Occupational health and safety (OHS)

Diving safety management system (DSMS)

A comprehensive integrated system for managing diving safety to ensure that risks are reduced to ALARP should be prepared and documented by a diving contractor in consultation with the contractor's employees and/or their representatives.

NOPSEMA assesses DSMSs against the requirements in the Safety Regulations. For more information see the 'Diving operations' page at nopsema.gov.au.

Petroleum safety zones applications (PSZ)

Petroleum safety zones are specified areas surrounding petroleum wells, structures or equipment which vessels or classes of vessel are prohibited from entering or being present. NOPSEMA's role in Part 6.6 of the OPGGS Act involves assessment of:

- PSZ applications
- written consent for vessels to enter and be present in a PSZ
- written authorisation for a vessel to enter and be present in the area to be avoided (ATBA).

For more information see the 'Petroleum safety zones' page at nopsema.gov.au.

Environmental management (EM)

Offshore project proposal (OPP)

An offshore project is one or more activities undertaken for the purpose of the recovery of petroleum, other than for appraisal, including movement of recovered petroleum by pipeline. An offshore project proposal is a document submitted by a proponent which:

- describes an offshore project
- identifies and evaluates impacts and risks to the environment associated with the project
- describes the environmental outcomes of the project
- is made available for public comment
- includes information about comments received during the comment period and how those comments have been addressed.

NOPSEMA assesses each OPP against the requirements of the Environment Regulations. For more information see the 'Offshore project proposal' page at nopsema.gov.au.

Well integrity (WI)

Well activity application (AAUWA)

Is a document submitted by a titleholder that applies for approval to undertake a well activity that leads to a physical change in the wellbore. It must describe the activity and the titleholder's proposed timetable for carrying out the activity.

Note: amendments to the Wells Regulations provide that the requirement to submit AAUWAs will cease at the end of 2017. The same amendments to the Well Regulations have expanded the content requirements of the WOMP to address the activities previously covered by AAUWAs.

2.1 Assessments

Assessments submitted (key permissioning documents)

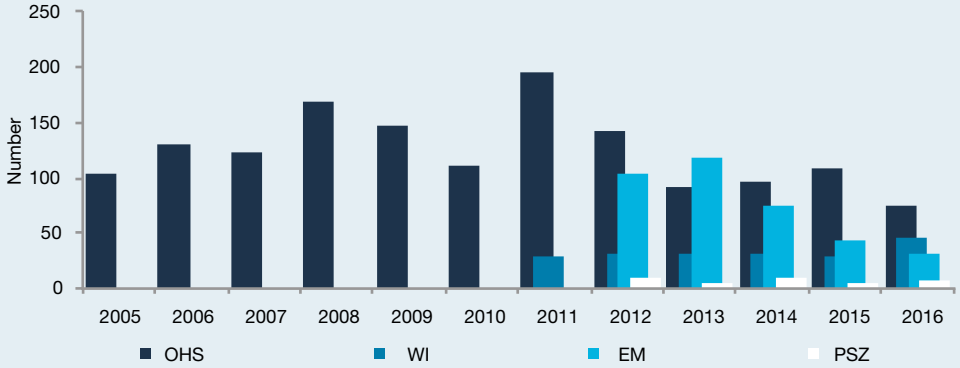


Figure 9.

Note: in previous editions this graph included all submission types received by NOPSEMA. In this edition, only the number of key permissioning documents received has been included. Key permissioning documents include: safety cases, DSMS, pipeline safety management plans (earlier years only), WOMPs, environment plans, OPPs and PSZ applications. For a list of all submissions types received by NOPSEMA, please refer to Appendix 5.

NOPSEMA continues to assess submissions within the legislated timeframes:

Assessments notified within legislated timeframes

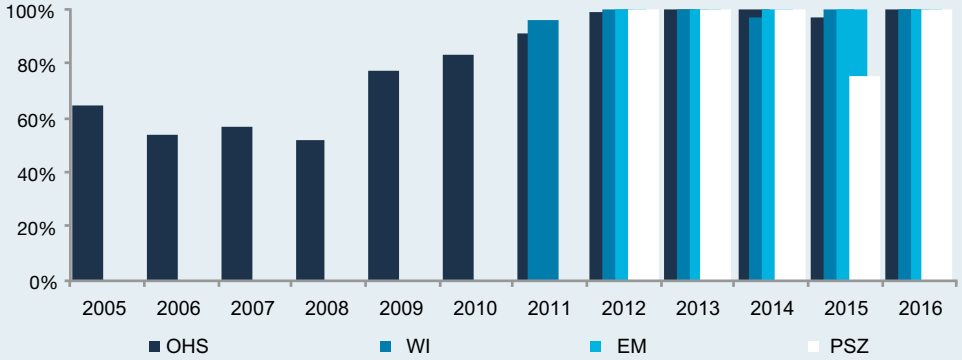


Figure 10.

During 2016...

73 safety cases submitted — 28% decrease from 2015

31 environment plans submitted — 29% decrease from 2015

45 well operations management plan submissions — 50% increase from 2015

8 PSZ applications submitted — 100% increase from 2015

During 2016...

100% OHS submissions

100% EM submissions

100% WI submissions

100% PSZ submissions

2.2 Assessment outcomes

When does NOPSEMA 'accept' a submission?

The occupational health and safety, well integrity and environmental management regulations administered by NOPSEMA include specific acceptance criteria which must be satisfied before NOPSEMA accepts a submission. For example, the criteria for acceptance of an environment plan require that the plan demonstrates that the environmental impacts and risks of the activity will be reduced to ALARP.

The proportion of submissions received that are 'accepted' by NOPSEMA is an indicator of several factors, including the ability of duty holders as a whole to demonstrate that all practicable risk reduction measures have been taken into consideration and reflects the different assessment processes under the regulations.

When does NOPSEMA not accept a submission?

Regulatory submissions that do not meet the relevant regulatory requirements are not accepted by NOPSEMA. If a submission is not accepted then the operation to which it relates cannot proceed. NOPSEMA will provide the duty holder with a refusal/rejection letter that contains information on which acceptance criteria were not met.

Under the legislation, duty holders are entitled to make a new submission for the same facility/activity. In such circumstances, the assessment process re-commences from the beginning.

During 2016...

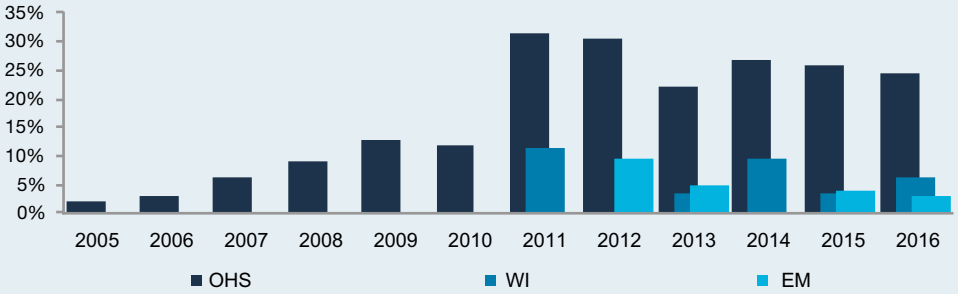
24% safety cases rejected

3% environment plans not accepted

6% well operations management plans not accepted

0% petroleum safety zone applications not accepted

Assessments not accepted



Note 1: Includes 'rejected', 'refused to accept', 'not agreed', 'not acceptable', 'not satisfied', 'declined'. OHS assessments include safety cases and diving safety management systems.

Note 2: For the last 3 years, on average 25% of OHS assessments (safety cases and diving safety management systems) were not accepted each year. Less than 7% of WI and EM assessments were not accepted during this same time period.

Figure 11.

Assessment and submissions

In 2016...

Safety cases (SCs)	Environment plans (EPs)	Well operations management plan (WOMPs)
73 SCs submitted (SP)	**31 EPs submitted**	**45 WOMPs submitted[6]**
There was a 28% decrease on the 102 SC submissions in 2015. Of the 73 submissions, 46 SCs were accepted in the same year, 13 were rejected and one was returned.	**There was a 29% decrease on the 44 EP submissions in 2015. Of the 31 submissions, 19 were accepted in the same year, no EPs were rejected and two were withdrawn by the titleholders.**	**There was a 50% increase on the 30 WOMP submissions in 2015. Of the 45 submissions, 27 were accepted in the same year, two WOMPs were rejected and no WOMPs were returned or recalled.**
As at 31 December 2016 13 SCs were still under assessment.	As at 31 December 2016 10 EPs were still under assessment.	As at 31 December 2016[6] 16 WOMPs were still under assessment.
The majority of SC submissions (81%) were revisions to existing SCs (mainly for change of circumstances/operations as opposed to five year revisions), with 14 new SCs received.	In contrast to previous years there was an increase in the number of operations environment plans (mainly revisions due to change of circumstances/operations). The first offshore project proposal was also submitted in 2016.	Titleholders were required to resubmit their well operations management plans under the New Well Regulations (discussed in further detail on page 24.
Common deficiencies in SC submissions that were rejected include: • insufficient detail of the technical and other control measures identified as a result of the formal safety assessment • inadequate identification in the formal safety assessment of the risk control measures to be used to reduce that risk to a level that is ALARP • insufficient integration of the safety management system and details of how it will provide for the continual assessment of risks and associated hazards.	No environment plans submitted in 2016 have been rejected thus far; however one environment plan submitted in 2015 was rejected in 2016. The grounds for refusal of this environment plan was that the implementation strategy as it related to the management of impacts from produced formation water discharges was not appropriate.	Common deficiencies in WOMPs that were rejected include: • insufficient and contradictory information provided about the monitoring of wells with integrity issues • insufficient details of blowout contingency plans for operating wells • insufficient and contradictory information provided about performance standards for well barriers • insufficient detail of how the wells' parameters are kept within design envelopes.

Table 6.

6 In 2016 NOPSEMA also received one WOMP submission under the Offshore Petroleum and Greenhouse Gas Storage Regulations 2011 (Victoria), as regulatory powers for well integrity in Victorian waters has been conferred on NOPSEMA. This Victorian WOMP was accepted.

Assessment and submissions

In 2016...

Safety cases (SCs)

Breakdown of accepted safety cases by facility type (55):

- 12 (22%) for FPSOs
- 12 (22%) for MODUs
- 11 (20%) for platforms
- 11 (20%) for vessels
- 9 (16%) for pipelines.

Environment plans (EPs)

The breakdown of accepted decisions for environment plan activity types (31):

- 11 (36%) for seismic
- 10 (32%) for operations
- 5 (16%) for drilling
- 3 (10%) for other
- 2 (6%) for decommissioning
- 0 (0%) for construction.

Well operations management plan (WOMPs)

Breakdown of well activities for accepted WOMP submissions under the New Well Regulations (42):

- 8 for drilling of explorations/appraisal wells
- 16 for productions operations (in some cases including future development drilling)
- 18 for suspended operations.

How long[7] does it take NOPSEMA to assess a safety case?

The average time to completion for new safety cases in 2016 was 82 days. This is slightly longer than last year (79 days).

Average safety case assessment timeframes

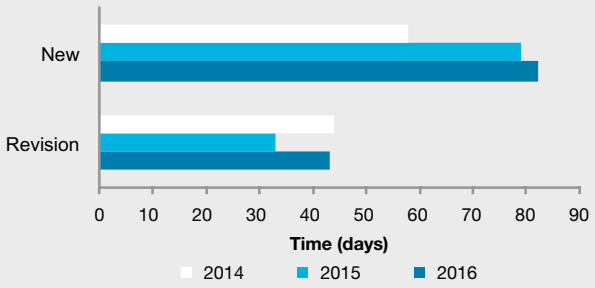


Figure 12.

How long[8] does it take NOPSEMA to assess an environment plan?

The average time to completion for new environment plan assessments in 2016 was 128 days. This is an improvement on the 139 days recorded in 2015.

Average environment plan assessment timeframes

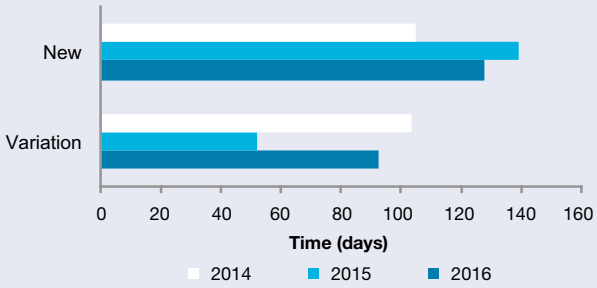


Figure 13.

How long does it take NOPSEMA to assess a WOMP?

The average time to completion for new WOMP assessments in 2016 was 40 days. This is an increase from 15 days in 2015 – see section on New Well Regulations.

Average WOMP assessment timeframes

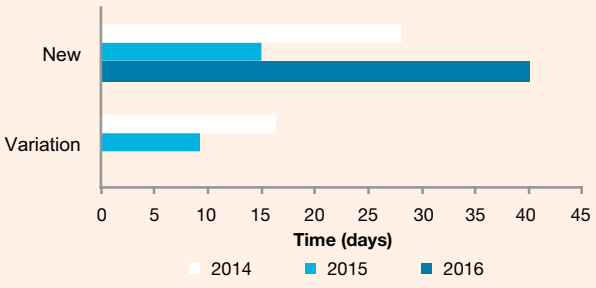


Figure 14.

7 The time taken for NOPSEMA to assess safety cases is also dependent on the operator, for example, providing timely responses to requests for further written information and validation statements.

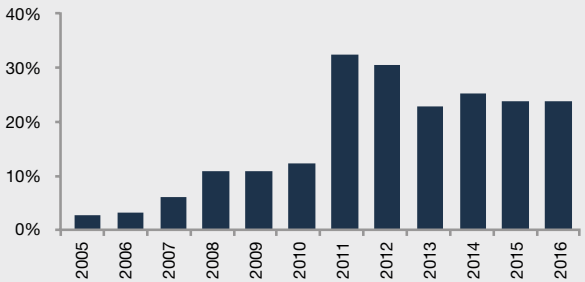
8 The time taken for NOPSEMA to assess environment plans is also dependent on the titleholder and the time taken to respond to opportunities for modification and resubmission, or responses to requests for further written information. The average time frame for assessment was influenced in 2016 by several long-running (>300 days) assessments.

In 2016...

Safety cases (SCs)

The average time to completion for revised safety cases in 2016 was 43 days. This is comparable to previous years.

Safety cases not accepted*



*Note: Based on year of completion. Shows rejections as a proportion of total safety cases assessed and completed (excludes recalled/returned assessments)

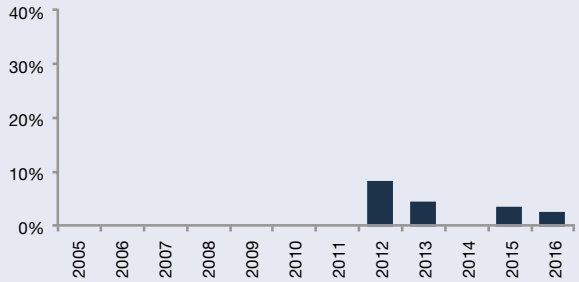
Figure 15.

24% of safety cases which completed assessment in 2016 were not accepted, which is comparable to recent years.

Environment plans (EPs)

The average time to completion for environment plan revisions in 2016 was 92 days. This is an increase on 2015's average of 52 days

Environmental plans not accepted*



*Note: Based on year of completion. Shows rejections as a proportion of total environment plans assessed and completed (excludes recalled/returned assessments)

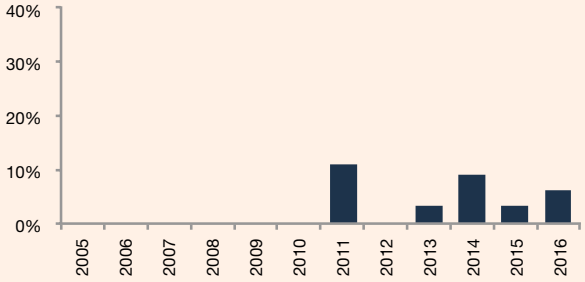
Figure 16.

3% of environment plans which completed assessment in 2016 were not accepted, which is comparable to last year's 4%.

Well operations management plan (WOMPs)

No WOMP variations were submitted and assessed in 2016.

Well operations management plan not accepted*



*Note: Based on year of completion. Shows rejections as a proportion of total well operations management plans assessed and completed (excludes recalled/returned assessments)

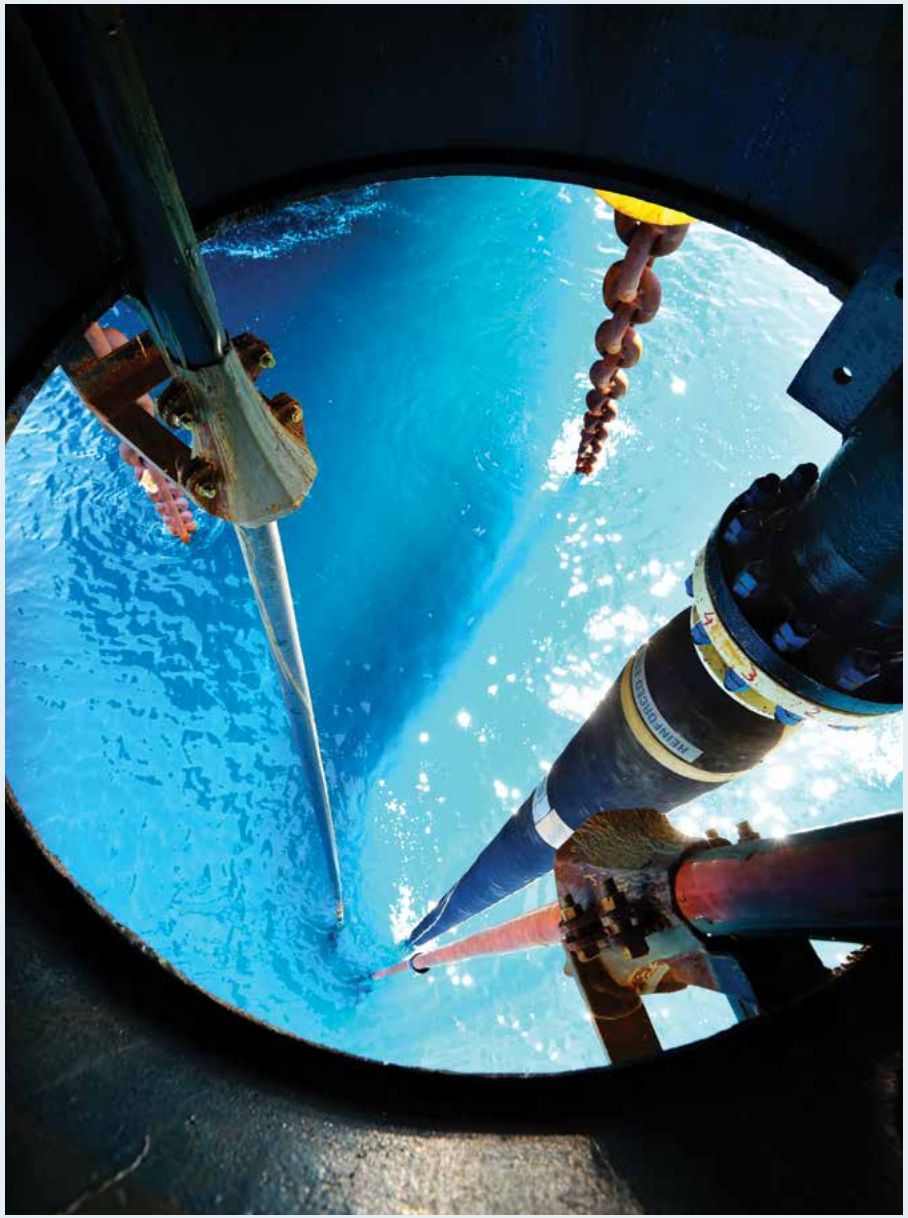
Figure 17.

6% of well operations management plans which completed assessment in 2016 were not accepted, which is slightly higher than 2015 (3%).

SPOTLIGHT New Well Regulations

In 2015 significant amendments were made to Part 5 of the Offshore Petroleum and Greenhouse Gas Storage (Resource Management and Administration) Regulations 2011, which outlines well integrity requirements (herein referred to as the New Well Regulations). These amendments came into effect on 1 January 2016 and require the inclusion of considerably more detail about the wells, and well activities, to be covered by the WOMP. The amendments also removed the requirement for titleholders to submit AAUWAs, as the detail previously provided in AAUWAs is now required to be included in the WOMP. The New Well Regulations also provide that the WOMP is to be complemented with well activity notifications to NOPSEMA (which provide information relating to the well activity) and final abandonment reports (to be submitted by the titleholder). Further, all suspended wells on a title that have not been accepted as permanently abandoned are deemed to be operational and as such must have a WOMP to detail the inspection and monitoring process until abandonment has been undertaken.

A two year transition period has been provided to allow titleholders to transition their existing WOMPs (those that were accepted prior to 1 January 2016) to new WOMPs under the New Well Regulations. Titleholders must submit new WOMPs by the end of the transition period on 31 December 2017. It is recommended that titleholders submit their new WOMP(s) allowing as much time as possible before the end of the transition period, to provide greater certainty about the status of the WOMP – noting that the average WOMP assessment time in 2016 was 40 days. Under the New Well Regulations, NOPSEMA can make a decision in relation to the new WOMP after the end of the transition period; however, if NOPSEMA does not accept the new WOMP, the existing WOMP will then also cease to be in force, and no well activities can be undertaken until a further new WOMP has been submitted, and accepted by NOPSEMA.



3. INCIDENT NOTIFICATIONS AND REPORTING

In 2016 there were no fatalities or serious injuries; a positive outcome considering five serious injuries were reported in 2015. There were four lost time injuries, down from seven in 2015. The number of dangerous occurrences decreased by 17% from the 364 reported in 2015 to 302 in 2016 (noting the reduction in industry activity during this period). NOPSEMA will continue to work with industry to ensure that corrective actions are appropriately targeted and will hold duty holders to account for any identified breaches of their duties or responsibilities.

During 2016...

No deaths or serious injuries were reported

There was a 28% increase in total OHS hydrocarbon releases

Accidents resulting in incapacitation >=3 days LTI decreased from 12 to 4

Damage to safety-critical equipment continues to be a risk

Incident notifications and reporting

Notification and reporting

Duty holders are required to notify NOPSEMA of offshore petroleum incidents as per the legislation. Full reports for notifiable incidents are required. Additionally, duty holders must provide monthly summary reports as per the legislation. For operators of facilities (OHS) these comprise death and injury data, and for environmental management titleholders these comprise recordable environmental incidents

Incident root causes

As part of the legislative requirement for operators to report accidents and dangerous occurrences to NOPSEMA, operators must provide a root cause analysis as part of each report. This contributes to a better understanding of the factors influencing offshore incidents and informs improvements to design, training, systems, processes and equipment in support of better health and safety outcomes.

Notifiable incidents		Recordable incidents
These incident types must be notified as soon as practicable to NOPSEMA (according to legislative timeframes) and comprise:		**These incident types must be reported to NOPSEMA on a monthly basis.**

OHS Incidents		EM Incidents		OHS Injuries
Accidents	**Dangerous occurrences**	**EM reportable**	**EM recordable**	**Injuries**
Incidents where an offshore worker is killed, suffers a serious injury, suffers an injury or illness requiring three or more days off work.	Incidents that did not, but could reasonably have, caused an accident.	Incidents relating to an offshore petroleum activity that have caused, or have the potential to cause, moderate to significant environmental damage.	Refer to breaches of an environmental performance outcome(s) or standard(s) contained in the environment plan that applies to an offshore petroleum activity.	Injuries requiring treatment other than first aid e.g. major injuries, lost time injuries, alternative duties injuries and medical treatment injuries.

3.1 Incidents – OHS

Accidents (4)

No fatalities or serious injuries were reported in 2016.

NOPSEMA was notified of four accidents, classified as LTIs causing incapacitation of ≥3 days.

Accident breakdown by facility type:

MODUs – 2

Platforms – 2

Accidents

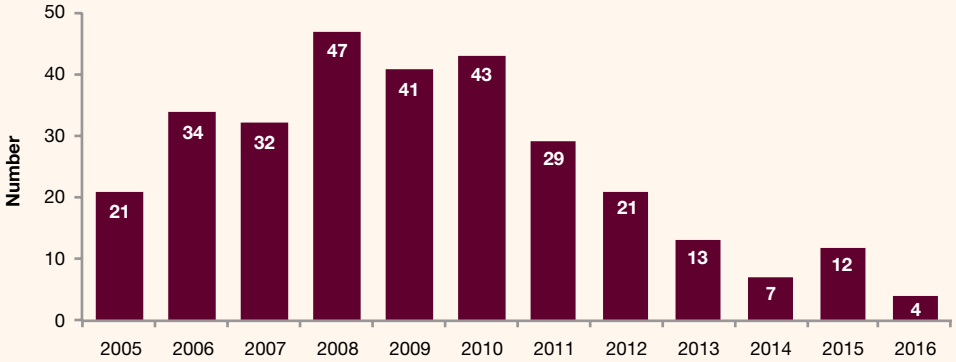
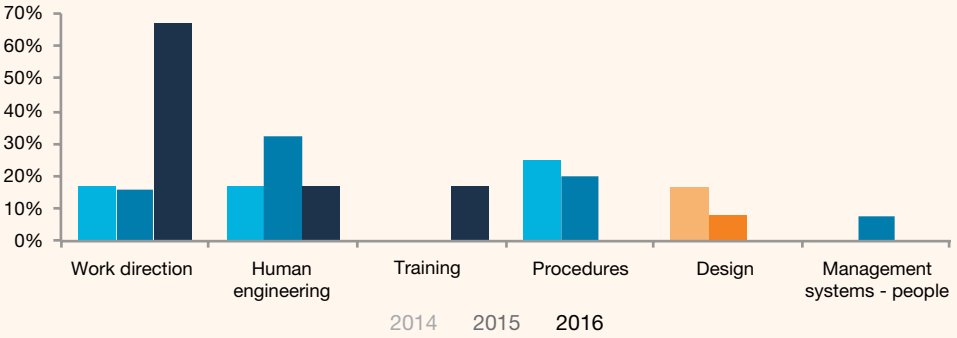


Figure 18.

Accidents basic causes - OHS



Blue = human performance difficulties; orange = equipment difficulties.

Figure 19.

The main causes for accidents in 2016 were attributed to lack of supervision and human error.

Incident notifications and reporting

Dangerous occurrences (302)

The number of dangerous occurrences reported to NOPSEMA had been relatively stable between 2012 and 2015, however, the number reported in 2016 decreased by 17%. In 2016, 56% of dangerous occurrences occurred on FPSOs, followed by platforms at 33% and MODUs at 8%.

The number of dangerous occurrences increased for a few incident categories:

Could have caused death or serious injury	Uncontrolled HC gas release >1 - 300 kg	Pipeline incidents	↑
Damage to safety-critical equipment	Uncontrolled PL release >80 – 12 500 L	Unplanned event – implement emergency response plan[9]	↑

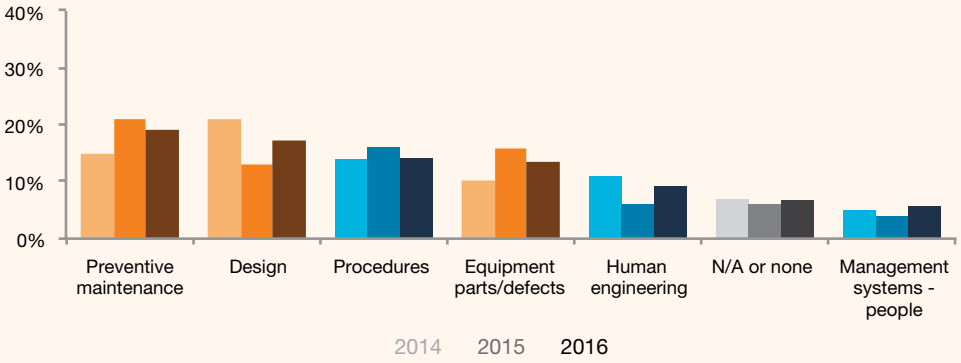
Table 7.

9 A number of incidents that required the implementation of emergency response plans were the result of false alarms or inadvertent manual call point activation due to human activities.

Dangerous occurrences

Figure 20.

Dangerous occurrences basic causes – OHS



Blue = human performance difficulties; orange = equipment difficulties.

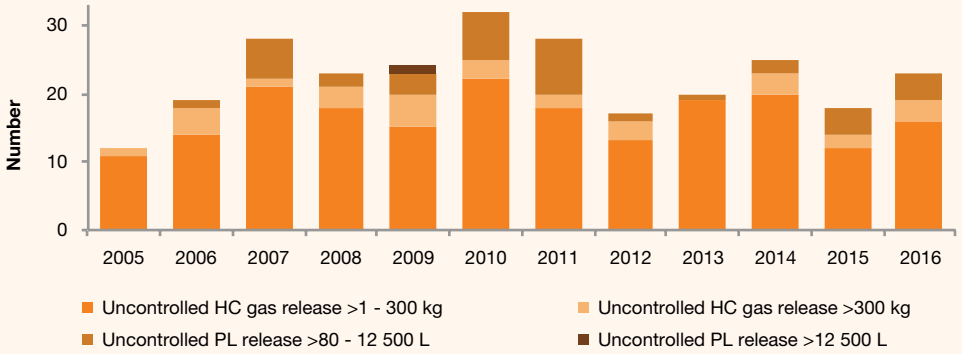
Figure 21.

The basic causes of dangerous occurrences are a mix of human performance and equipment difficulties.

SPOTLIGHT OHS hydrocarbon releases

23 reported in 2016

OHS hydrocarbon releases



65% occurred on platforms

3,703 kg of gas released in total

All incidents were of negligible or minor severity

Figure 22.

	2015	2016
There was a 28% increase in the total number of HC releases (gas and liquid). Gas releases increased from 14 to 19, while liquid releases remained at four for both 2015 and 2016	18	23 ^
HC gas releases >300 kg increased slightly in 2016	2	3 ^
Of the HC releases, 15 (65%) occurred at platforms, 7 (31%) on FPSOs and 1 (4%) on a MODU		

Table 8.

SPOTLIGHT OHS hydrocarbon releases (continued)

23 reported in 2016

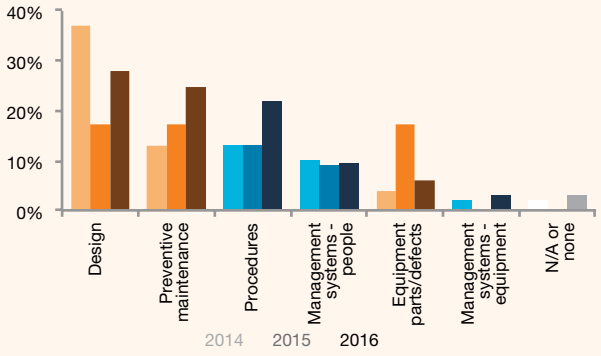
This spotlight focuses on OHS hydrocarbon releases. Some reported hydrocarbon releases qualify under both sets of reporting criteria and as such are both OHS and EM incidents. There were three uncontrolled releases reported as both OHS and environmental hydrocarbon releases in 2016.

Design was the top root cause identified by operators for hydrocarbon releases in 2016, followed by preventive maintenance and procedures.

Equipment material degradation was identified as the primary failure mechanism in 43% of hydrocarbon release incidents in 2016. In previous years, pressure and corrosion were the main failure mechanisms.

Failure of equipment installed on pressure vessels and piping, and gas compression systems were the main contributors to hydrocarbon releases in 2016. Corroded piping, failed small bore fitting / tubing and degraded valve components attributed largely to the hydrocarbon release events.

Hydrocarbon release basic causes - OHS



Blue = human performance difficulties; orange = equipment difficulties.

Figure 23.

OHS hydrocarbon releases - mechanism of incident

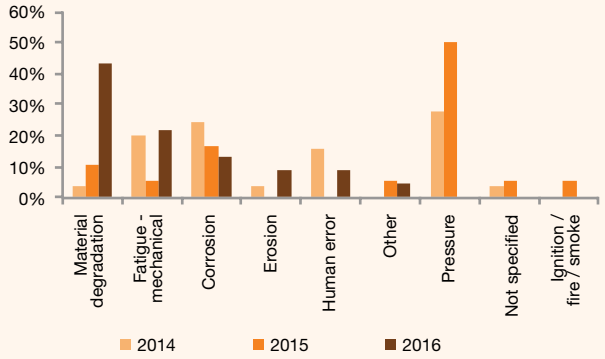


Figure 24.

OHS hydrocarbon releases - equipment system failures

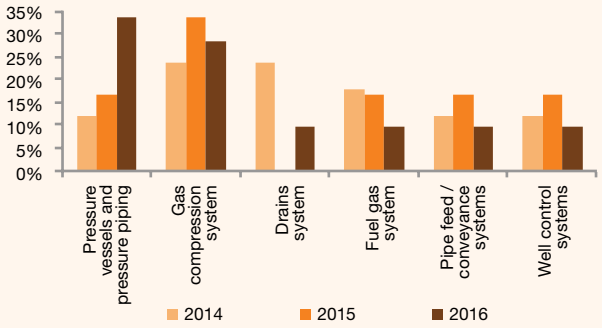


Figure 25.

SPOTLIGHT Environmental management – hydrocarbon releases

5 reported in 2016

Reportable environmental incidents

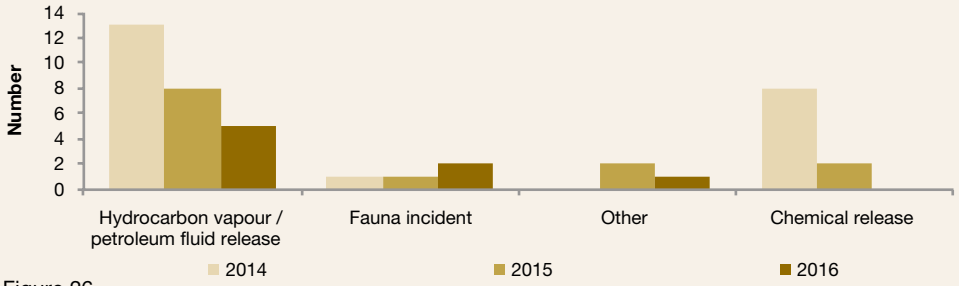


Figure 26.

Five reportable hydrocarbon spills

Total oil spilled ~ 11,500 litres

Of the eight reportable environmental management incidents in 2016, five (63%) were either hydrocarbon vapour or petroleum liquid releases. Reportable incidents are those which are determined to have caused, or have the potential to cause, moderate to significant environmental damage. There has been a decrease in environmental management hydrocarbon releases from 2014 to 2016; representing a positive environmental trend. Of the incidents in 2016, most were considered low in volume (see table 9 below) and therefore of restricted environmental impact. The incident resulting in a larger volume release was investigated by NOPSEMA: see Chapter 6 ‘Investigations’ for more details.

Type	Volume	Description	Cause
Light condensate	169 L	Sheen observed on water.	Perforation of subsea production riser.
Petroleum fluid	10 500 L	Leak identified during routine remotely operated vehicle (ROV) subsea risk based inspection works.	Leak from vent on subsurface safety valve (SSSV) control module on well head.
Petroleum fluid	140 L	Oily water content from port side overboard discharge line.	Misdirected flow of hydrocarbons to overboard line.
Gas	1.5 kg	Gas leak on fuel gas line (topside).	Pipe fitting not tightened following maintenance.
Hydraulic/fuel oil	106 L	Sheen observed on water.	Oil discharge monitor detector line blocked preventing normal operation.

Table 9.

SPOTLIGHT Damage to safety-critical equipment

81 reported in 2016

Damage to safety-critical equipment

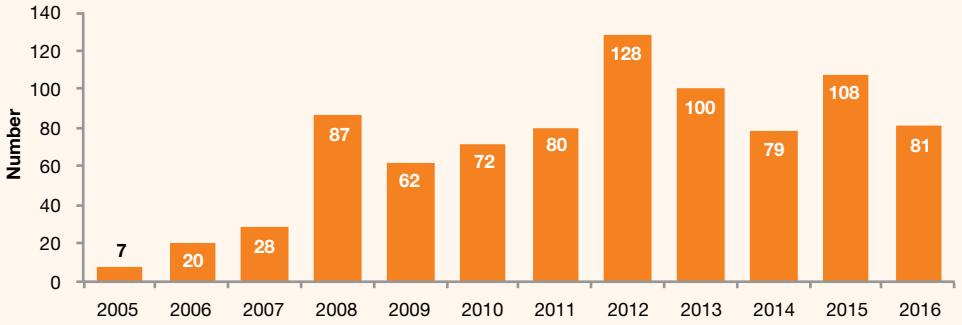


Figure 27.

72% occurred on FPSOs

Preventive maintenance is the main cause identified by operators

73% warranted investigation as part of a planned inspection scope

Safety-critical equipment (or element) is any component part of structure, equipment, plant or system whose failure could cause a major accident event.

	2014	2015	2016
There was a 25% decrease in the number of damage to safety-critical equipment incidents from 2015 to 2016	79	108	81
These incidents contribute a notable proportion (27%) of all dangerous occurrences reported in the past three years	23%	30%	27%
Of these incidents, 58 (72%) occurred on FPSOs, 20 (25%) on platforms and three (4%) on MODUs			

Table 10.

SPOTLIGHT Damage to safety-critical equipment

81 reported in 2016

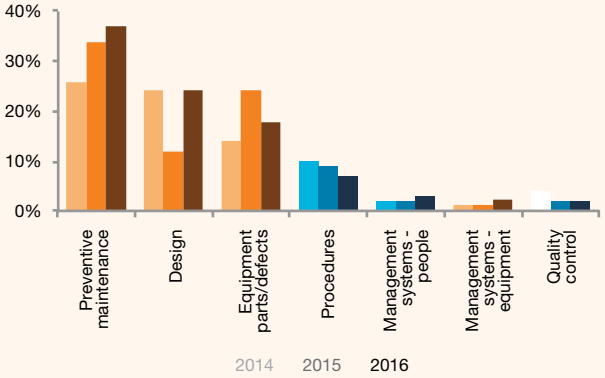
Lack of preventive maintenance has consistently been the top root cause identified by operators in the past three years, followed by design inadequacies and run to failure adopted for ageing equipment components.

Main contributors in this category are emergency shutdown and blowdown valves on FPSOs, corrosion and ageing pipe and fittings (hydrocarbon service), electrical equipment and emergency battery banks.

Fire system contributors: functional failures of fire dampers, foam mixing systems and fire water pumps.

In terms of process equipment, the main contributor was damage to safety-critical valves.

Damage to safety-critical equipment - basic causes



Blue = human performance difficulties; orange = equipment difficulties.
Figure 28.

Top three equipment types	
Emergency Shutdown and Blowdown Valves	44%
Pipes and Fittings	12%
Batteries and Electrical Equipment	10%

Top three system types	
Fire Systems	33%
Process Equipment	14%
Uninterrupted Power Supply	8%

Table 11.

SPOTLIGHT OHS dropped objects

24 reported in 2016

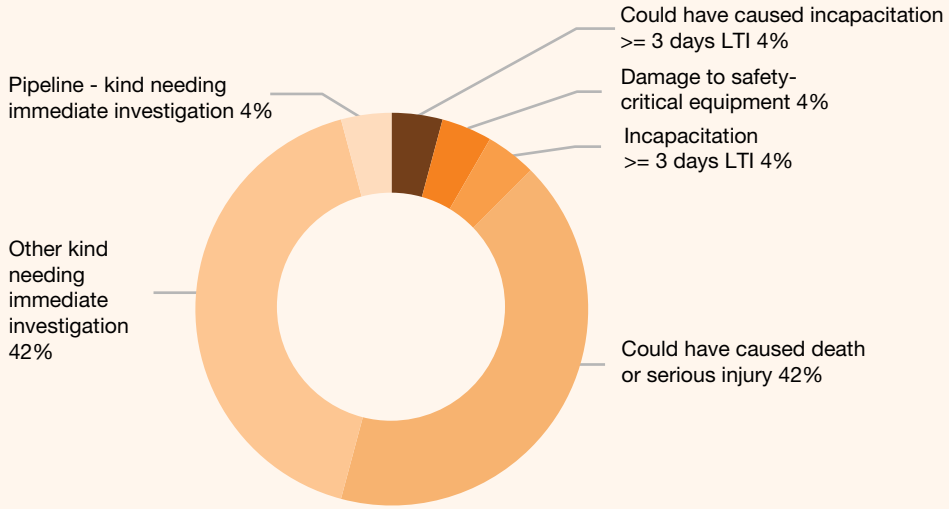


Figure 29.

54% occurred on MODUs

96% were investigated as part of a planned inspection scope

Procedures is the top root cause identified by operators

A dropped object may be defined as any object with a potential to cause death, injury, or equipment/environment damage that falls from its previous static position under its own weight.

	2014	2015	2016
There was a 38% decrease in the number of dropped object incidents from 2015 to 2016	19	39	24
Of the dropped object incidents, 13 (54%) occurred on mobile offshore drilling units, five (22%) on normally attended platforms, two (8%) on FPSOs, two (8%) at not normally attended platforms, one (4%) was on a vessel and one (4%) on a pipeline			

Table 12.

SPOTLIGHT OHS dropped objects

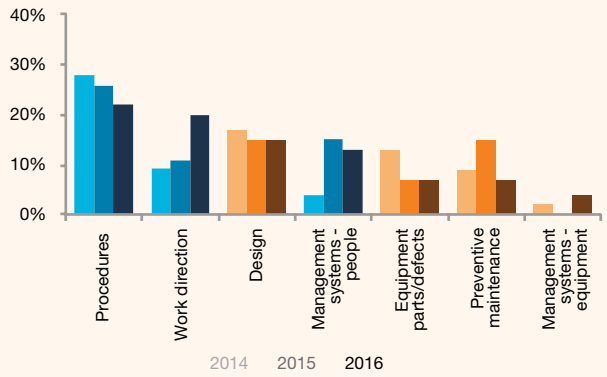
24 reported in 2016

Procedural deficiencies have consistently been the top root cause identified by operators in the past three years, followed by work direction and design.

Task hazard and risk control: deficiencies in hazard identification and risk control prior to conducting lifting operations, and job specific lifting operations check sheets and procedures not followed.

Preventive maintenance: failure of equipment resulted in dropped objects due to a lack of understanding of corrosion threats, lifting equipment design constraints and inadequate inspection regimes.

Dropped objects - basic causes



Blue = human performance difficulties; orange = equipment difficulties.

Figure 30.

Top three procedural and work direction issues	
Task hazard and risk control	78%
Hard barricading and signage	14%
Dropped object exclusion zone	8%

Top three design and management system issues	
Preventive maintenance not identified	50%
Preventive maintenance implementation	30%
Lifting equipment design	20%

Table 13.

3.2 Incidents – environmental management

Environmental reportable incidents (8)

The number of environmental management reportable incidents decreased 38% over the last year to eight.

Incident breakdown:

Hydrocarbon vapour or petroleum liquid releases	5	**63%**
Fauna incident	2	**25%**
Other[10]	1	**12%**

Table 14.

Almost all incidents occurred during operations-related petroleum activities (88%). A single incident involved drilling (12%).

Reportable environmental incidents

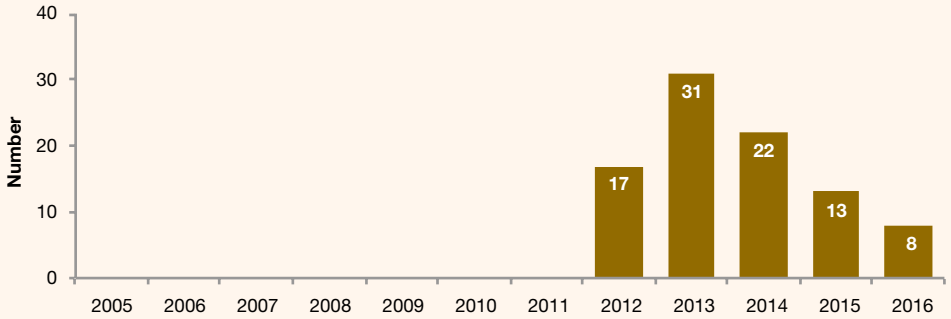


Figure 31.

10 Note: the incident in this 'other' category involves a hydraulic fluid release.

Environmental recordable incidents

Approach to recordable incident representation:

After analysing four years of environmental incident history, NOPSEMA has decided to increase focus on publishing amalgamated data on environmental reportable incidents and cease publication of recordable incident statistics. This is due to inherent variability in the nature of recordable incidents (due to the variability of environmental performance outcomes and standards contained in environment plans), and the fact that they are associated with occurrences with low or no environmental damage.

Recordable incidents specific to individual titleholders remain useful in managing petroleum activities and for NOPSEMA as a regulator. Titleholders should use their recordable incident data to analyse and manage non-conformances and identify areas for improvements in prevention of impacts and risks to the environment. NOPSEMA considers this environmental performance information in the selection of petroleum activities for inspection and the scope of inspections relating to titleholder systems for reporting, managing and addressing non-conformances. As such, NOPSEMA expects titleholders to continue to report and address recordable incidents.

NOPSEMA will continue to publish information about reportable incident and other compliance statistics in its online quarterly reports and annual offshore performance report. NOPSEMA has a project underway through the International Offshore Petroleum Environment Regulators forum to develop key reporting parameters across the oil and gas industry globally.

3.3 Fatalities and injuries

What injury data does NOPSEMA collect?

NOPSEMA compiles injury data from mandatory monthly reports submitted by operators to NOPSEMA. By law, the injury summary reports cover all fatalities, injuries, illness and disease suffered by workers offshore requiring medical treatment or time off regular duties.

What does the injury data indicate?

While injury rates are typically not an indicator of major accident events, the lowering of injury rates since 2008 should still be commended as this represents actual harm avoided and demonstrate continuing efforts by operators in keeping the workforce injury free.

How is the injury rate calculated?

NOPSEMA calculates the injury rate by taking the total number of injuries recorded against the total hours worked and then standardising to one million hours. This allows for direct comparison between years. The average number of injuries reported per year since 2005 is 112.

During 2016...

No offshore fatalities were reported

Platforms reported 25 injuries (48% of all injuries)

↓ The number and rate of injuries decreased

Only 12% of injuries resulted in lost time

Incident notifications and reporting

Total injury rate – trends by facility type from 2005 to 2016

Figure 32.

FPSOs/FSOs

Moderate increase over the last year from 6.4 to 8.2 injuries per million offshore hours worked

Figure 33.

Platforms

Slight decrease over the last year from 7.1 to 6.0 injuries per million offshore hours worked

Figure 34.

Pipelines

The 2014 peak in the injury rate is due to an injury that occurred while divers were working on a pipeline. Pipelines are not normally attended facilities

Figure 35.

MODUs

Slight decrease over the last year from 3.3 to 2.6 injuries per million offshore hours worked

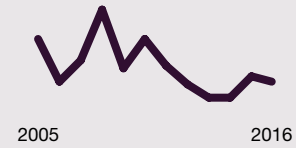


Figure 36.

Vessels

Moderate decrease over the last year from 6.3 to 5.2 injuries per million offshore hours worked

NOPSEMA notes that the rate of injuries per million hours worked had been in a relatively steady decline over the last few years, and this trend continues in 2016 (following a slight rise in 2015). Offshore workers continue to suffer work related injuries preventing them from performing their normal duties. Duty holders must continue to strive for better health and safety outcomes for offshore workers. Notifications of accidents and dangerous occurrences must be reported to NOPSEMA as soon as reasonably practicable following the event.

3.4 Total recordable cases (TRCs)

TRCs (commonly referred to as 'total injuries') are calculated by adding the number of fatalities, major injuries, lost time injuries (LTIs), alternative duties injuries (ADIs) and medical treatment injuries (MTIs) reported.

Fatalities		Major injuries		Lost time injuries		Alternative duties injuries		Medical treatment injuries		Total injuries (TRCs)
0	+	0	+	6	+	24	+	22	=	52

There were 52 TRCs reported in 2016; a 41% decrease from 2015. The TRC rate (which takes into account industry activity levels) in 2016 also decreased from 5.60 to 5.36.

Total recordable cases

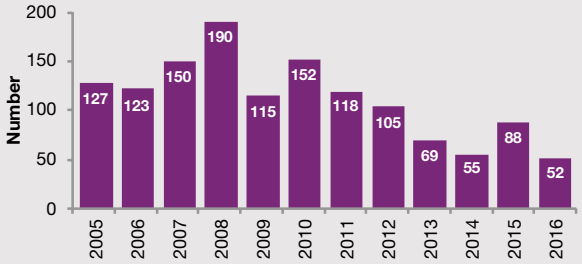


Figure 37.

Figure 38-41 show injuries reported to NOPSEMA in 2016 against the type of occurrence classification system (TOOCS) used by Safe Work Australia:

- nature of injury
- location of injury
- mechanism of incident
- agency of injury.

43% of injuries reported in 2016 were wounds. The most frequently reported mechanism of injury at 31% was workers being hit by moving objects.

Total recordable cases - nature of injury

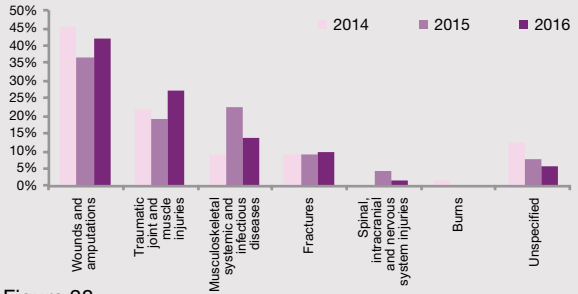


Figure 38.

Total recordable cases - mechanism of incident

Figure 40.

45% of reported injuries were to worker's upper limbs. Non-powered equipment was the most frequently reported agency of injury - 43% of all recordable cases.

Total recordable cases - location of injury

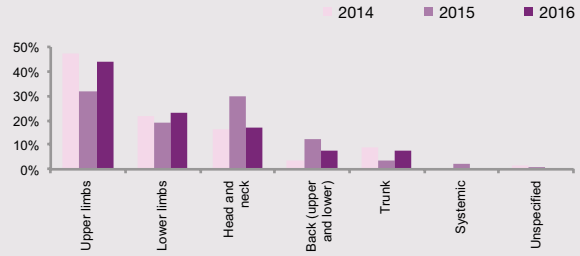


Figure 39.

Total recordable cases - agency of enquiry

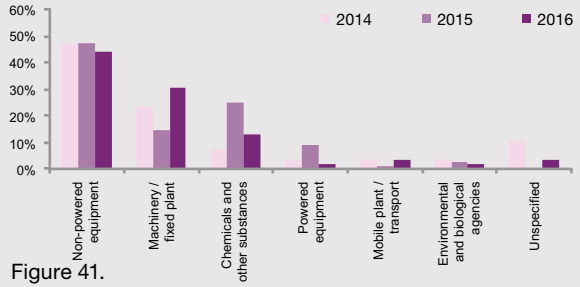


Figure 41.

3.5 Injury groups

Total injury rate – trends by facility type from 2005 to 2016

5 – major injuries (MIs)		Less serious injuries		
0 – major injuries (MIs)	4 – lost time injuries ≥3 days (LTIs ≥3)	2 – lost time injuries <3 days (LTIs <3)	24 – alternative duties injuries (ADIs)	22 – medical treatment injuries (MTIs)
Result in hospitalisation, unconsciousness, fractures etc.[11]	Result in a worker having three or more days off work.	Result in a worker having one or two days off work.	Result in a worker being assigned duties other than normal duties.	Result in a worker requiring medical treatment other than first aid.

The sparklines below indicate injury trends from 2005 to 2016

Figure 42.

Decrease from 0.32 to 0.00

Figure 43.

Decrease from 0.45 to 0.41

Figure 44.

Increase from 0.13 to 0.21

Figure 45.

Increase from 1.91 to 2.47

Figure 46.

Decrease from 2.80 to 2.27

NATURE	N/A	2 wounds/ lacerations (50%) 1 muscle/joint injury (25%) 1 other (25%)	1 muscle/joint injury (50%) 1 fracture (50%)	10 traumatic joint/muscle injuries (42%) 8 wounds/lacerations (33%)	12 were wounds (55%) 4 were musculoskeletal (18%)
LOCATION	N/A	4 upper limbs (100%)	1 upper limbs (50%) 1 lower limbs (50%)	10 upper limbs (42%) 6 lower limbs (25%)	8 upper limbs (36%) 7 head and neck (32%) 5 lower limbs (23%)
MECHANISM	N/A	3 hit by moving objects (75%) 1 other (25%)	1 hit by moving objects (50%) 1 body stressing (50%)	8 hit by moving objects (33%) 7 hitting objects (29%) 5 body stressing (21%)	7 hitting objects (32%) 5 body stressing (23%) 4 hit by moving objects (18%)
AGENCY	N/A	2 by non-powered equipment (50%) 1 by machinery/fixed plant (25%) 1 other (25%)	2 by non-powered equipment (100%)	12 by non-powered equipment (50%) 9 by machinery/fixed plant (38%)	7 by non-powered equipment (32%) 6 by machinery/fixed plant (27%) 6 from chemicals/substances (27%)

11 Refer to glossary for full definition. 'Any day' includes rest days, weekend days, leave days, public holidays, or days after ceasing employment.

Note: not all injuries are included in percentages displayed above. The data only shows the most common categories for ADIs and MTIs.

4. COMPLAINTS

NOPSEMA receives and investigates complaints about conditions and issues that may affect the occupational health and safety of workers at a facility, or the environmental management of an activity.

NOPSEMA encourages members of the offshore workforce to first raise any health and safety or environmental management concerns with facility/activity management or health and safety.

Two complaints were received in 2016: one relating to an occupational health and safety issue and the other to do with environmental management. Both were investigated by NOPSEMA. The environmental management complaint related to the impacts of a proposed seismic survey to a fishery, identified as a result of research commissioned by the titleholder but not applied. NOPSEMA issued two enforcement actions to the titleholder as a result of its investigation. For more information on the investigation and enforcement actions, see Chapter 6 'Investigations' and Chapter 7 'Enforcements'.

Complaints against dutyholders

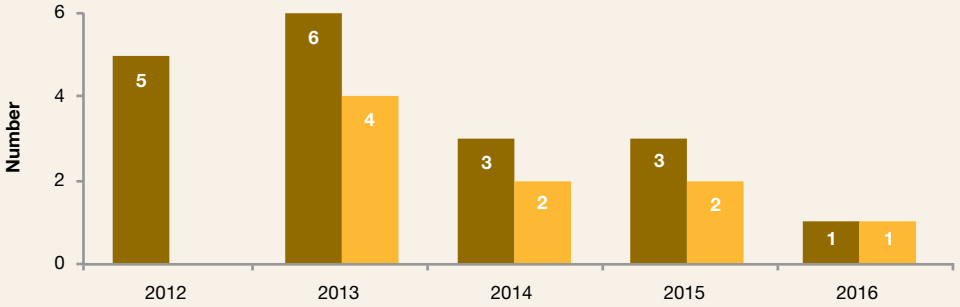


Figure 47.

Information provided to NOPSEMA

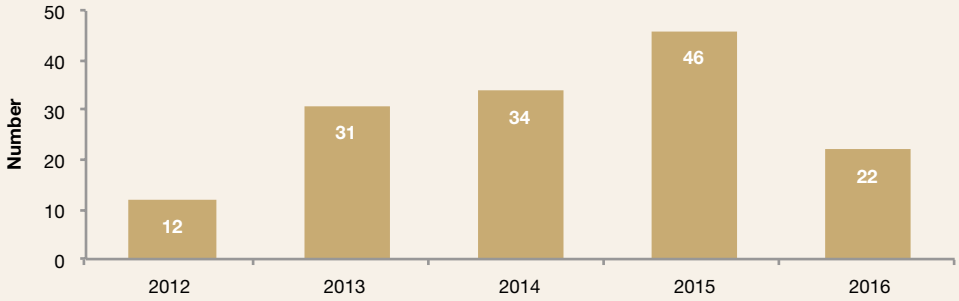


Figure 48.

Information provided to NOPSEMA

This category is used when NOPSEMA receives information from stakeholders where, for example:

- the information does not form the basis of a complaint
- the event is not notifiable under the regulations
- it is unclear for what purpose the information is being provided.

Prior to 2012, some of these notifications were included with complaints data, based on interpretation of the information provided.

This is reflected in previously published data where there are a higher number of recorded complaints prior to 2012.

In 2016...

NOPSEMA received 22 'Information provided to NOPSEMA' notifications.

These were dealt with depending upon the nature of the issue, where appropriate, such as through investigation, through inclusion as a topic in a subsequent inspection, or other actions as appropriate.

5. INSPECTIONS

In 2016, 143 inspections were conducted by NOPSEMA (covering a total of 206 facilities, titles and petroleum activities), which is a 27% decrease on the 195 inspections undertaken in 2015. This reduction reflects the reduced levels of industry activity in 2016.

NOPSEMA conducts inspections to monitor duty holders' compliance with their legislative duties and to gain assurance that they have implemented, and are complying with, the risk management systems described in their accepted regulatory permissioning documents. Where duty holders are found to be non-compliant, NOPSEMA takes appropriate and proportionate action to improve OHS, well integrity and environmental management performance. For more information about NOPSEMA inspections, see the 'Inspections' and 'Compliance inspections' pages at nopsema.gov.au. For information on enforcement action issued by NOPSEMA in 2016, see Chapter 7.

NOPSEMA inspections in 2016 included:

	OHS	Well integrity	Environmental management
Inspections	93 OHS inspections at 112 different facilities or associated business premises across Australia, compared to 114 inspections in 2015.	6 well integrity inspections, compared to 12 in 2015.	44 environmental management inspections, compared to 69 in 2015.
Recommendations	1021 recommendations were issued.	42 recommendations were issued.	285 recommendations were issued.

Inspections

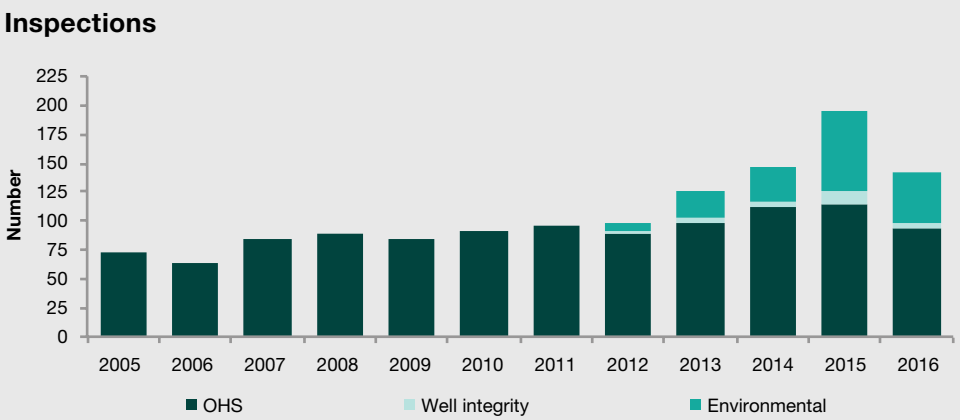


Figure 49.

During 2016...

NOPSEMA continued using a risk-based inspection policy for the 143 inspections in 2016

93 OHS inspections were conducted

44 environmental management inspections were conducted

6 well integrity inspections were conducted

5.1 Inspection scopes

NOPSEMA inspectors prepare inspection scopes in accordance with the NOPSEMA inspection policy (available at nopsema.gov.au).

A wide range of potential scope items are considered when planning an inspection. Any number of these items may be selected for focus by NOPSEMA inspectors during an inspection.

NOPSEMA issues inspection reports and recommendations to duty holders based on findings against the inspection scope items.

NOPSEMA inspectors must prepare and issue an inspection report as soon as practicable, which includes any recommendations arising from the inspection. NOPSEMA uses a regulatory management system (RMS) to record and track recommendations, duty holder's responses to recommendations and the proposed timeframe for addressing recommendations. Where appropriate, enforcement notices may be issued however, these notices will only be issued in accordance with relevant legislative requirements and NOPSEMA's enforcement policy.

Inspections

For the relevant NOPSEMA divisions inspection scopes are informed by:

OHS inspection scopes	Well integrity inspection scopes	Environmental management inspection scopes
When programming OHS inspection scopes, NOPSEMA inspectors employ a risk-based methodology that considers the following: • relevant duty holder and facility-related risk factors • previous performance and compliance history (informed by inspections, investigations, incident history and other performance factors) • industry incident trends • responses to recommendations from previous inspections.	The NOPSEMA well integrity inspection scopes are designed to examine a titleholder's management of well operations and their compliance with their accepted well operations management plan and duties with respect to wells. These are based on the accepted WOMP and the activities associated with the WOMP. Well integrity inspections are generally conducted in two parts: • an onshore inspection at a titleholder's regulated business premises • an offshore inspection on the facility carrying out the well activity,	Programming of environmental inspections is undertaken using a risk-based methodology. The activities targeted for inspection are those considered to carry the highest environmental risk, including activities: • that are a first for a titleholder • involving exploration, development and production of heavier crude oils • that overlap biologically important areas or habitats critical to the survival of threatened and migratory species.
Inspection scopes in 2016 included:		
• loss of containment • maintenance management • management of change (MoC) • inspection, maintenance and repair • station keeping and loss of position • permit to work • emergency management • dropped objects.	• well barrier management • titleholder communications with third parties • MoC • source control containment • document control and records management • well integrity – primary cementation • contractor management • maintenance management.	• emergency response arrangements • ongoing consultation • management of change and environment plan revision • financial assurance • monitoring, audit, management of non-conformance and review • produced formation water management • training and competence • monitoring environmental impacts • drilling mud management.

Note: NOPSEMA also regularly incorporates inspection scope items to verify that actions are implemented to close out recommendations arising from previous inspections.

Inspections

NOPSEMA focuses some inspection effort on selected risk area topics that have common relevance to either all of the Australian offshore petroleum industry or to a particular sector within the industry. This chapter shares NOPSEMA's general observations on a number of these risk area topics inspected in 2016 for the benefit of the broader industry, offshore workers and community stakeholders.

OHS – maintenance management

What is maintenance management?

Maintenance management is defined as systems, processes, procedures and resources that are integrated to support work management requirements on plant and equipment, undertaken with the intention of:

- re-instating physical condition of an asset to a specified condition
- preventing further deterioration or failure
- restoring correct operation within specified parameters
- replacing of equipment and components at the end of their useful/economic life
- assessing of condition of the equipment against wear and degradation mechanisms
- maintain and continuously improve the condition of equipment to ensure safety, reliability and efficiency.

Why is maintenance management an a rea of NOPSEMA inspection focus?

Good maintenance management practices are critical to reliable operation of equipment and the ongoing management of risks, and ensure:

- the development and improvement of maintenance management strategies for equipment, in particular safety-critical equipment
- implementation of equipment assurance activities as part of maintaining integrity
- delivery of good maintenance management practices to ensure health and safety of members of the offshore petroleum workforce.

How can duty holders improve maintenance management?

Duty holders are encouraged to:

- regularly monitor, assess and audit maintenance management work compliance, with specific emphasis placed on equipment classified as safety-critical
- ensure personnel performing maintenance management activities have the relevant competencies to perform the maintenance function safely and to ensure equipment being maintained continues to meet its performance standards

OHS – loss of station keeping/position

What is loss of station keeping/position?

Vessels (including semi submersibles) in the offshore petroleum industry conduct a range of activities, such as drilling, well intervention, pipe laying, heavy lifting, construction, decommissioning, subsea inspection, maintenance, repair, diving support and floating accommodation. The majority of these activities can be conducted over subsea wells or hydrocarbon infrastructure; or adjacent to floating or fixed production platforms.

To safely conduct these activities vessels must operate within a defined positioning envelope and within safe working limits. To maintain their position vessels utilise either a mooring system or dynamic positioning (DP) systems.

A loss of station keeping/position event is where the vessel exceeds its safe working limits in relation to vessel positioning.

Why is loss of station keeping/position an area of NOPSEMA inspection focus?

DP vessels are designed and operated to ensure that a single point failure in any active or passive DP component/system will not cause a loss of position. However, all DP vessels are subject to events (equipment failure, human error, adverse environmental conditions, poor project planning etc.) that can cause or contribute to a loss of station keeping/position event.

A loss of station keeping/position event can cause or result in:

- structural damage to vessels and/or platforms
- structural damage to subsea infrastructure, including wells
- structural damage to equipment
- diver or bell entanglement/loss
- hydrocarbon release
- harm to persons
- harm to the environment.

How can duty holders improve station keeping/position?

NOPSEMA inspections have identified a number of areas were DP management can be strengthened, including ensuring:

- dynamic positioning operator (DPO) familiarisation training is sufficient to retain operator competency when operators are changed or when the vessel has not been in Australian waters for an extended duration
- appropriate position reference system (PRS) selection and use (noting that some PRS take time to deploy, calibrate and install and are therefore occasionally replaced with less effective PRS substitutes due to cost pressures)
- that all potentially affected persons are involved in regular loss of dynamic positioning drills (including for example gangway operators, crane operators, flexible pipe tension controllers, drillers etc.).

Inspections

Well integrity – control measures and performance standards

What is the driving force behind well integrity inspections?

Since the reported findings of the Macondo and Montara inquiries the focus of well integrity inspections has been to verify that the titleholder has a management system in place that encompasses all aspects of the titleholder's well integrity processes for the lifecycle of the well(s).

It has now been established that all titleholders have management systems in place and the focus of inspections going forward will be to ascertain that the titleholder is performing their commitments as described in the WOMP "in force" including the titleholder's defined performance outcomes.

Why are control measures and performance standards an area of NOPSEMA inspection focus?

NOPSEMA targets inspections to ascertain that the control measures and performance standards described in titleholders' WOMPs adequately reflect performance outcomes against which the performance of the titleholder, in maintaining the integrity of the well, will be measured.

Specific technical areas of inspection will encompass, but not be limited to, control measures and performance standards for:

- well barrier monitoring and maintenance
- placement and monitoring of cement barriers
- measures to regain control of a well where there is loss of integrity (blowout contingency planning)
- monitoring / inspection of suspended well(s)
- the placement and verification of abandonment barriers.

How can duty holders improve their performance?

It has been ascertained that all titleholders have a management of change (MoC) process as an integral part of their management system, however from information gleaned during inspections, in many cases the titleholders are not performing adequate risk assessments to justify that the proposed change provides for the risk to integrity of the well(s) to continue to be reduced as low as reasonably practicable (ALARP) and, if not, when remedial work will be performed to restore full integrity.

Environmental management – consultation

What are the consultation requirements for oil and gas companies?

The Environment Regulations require that consultation be undertaken by titleholders to ensure that people who may be affected by an activity are given the opportunity to inform the titleholder how they may be affected and to allow the titleholder to assess and address any objections or claims about an activity in the preparation of environment submissions.

The purpose of consultation between titleholders and stakeholders is to maximise transparency and to ensure that the rights of relevant people are upheld and appropriately taken into account during the preparation of an environment plan.

There is also a requirement for titleholders to have appropriate plans in place for ongoing consultation with relevant people.

As an independent regulator, it is NOPSEMA's role to monitor and enforce compliance of titleholder's consultation performance.

Why is consultation an area of NOPSEMA inspection focus?

In 2015 NOPSEMA identified through a series of consultation focussed inspections that poor environmental consultation practices in the offshore petroleum industry can lead to negative impacts on individuals, communities, and organisations. NOPSEMA also received feedback that the current transparency of its decision-making processes and practices is not meeting community expectations.

As a result of this feedback, NOPSEMA implemented a 'Stakeholder engagement and transparency' work program to improve consultation practices and increase transparency. Quarterly summary status reports on the progress of this program are prepared and published on the 'Stakeholder engagement and transparency' page at nopsema.gov.au.

In late 2016, NOPSEMA commenced a series of inspections focused on titleholders' consultation practices to re-examine current practices. This effort included inspecting seven petroleum activities where ongoing consultation with relevant persons was important to responsible environmental management and industry's social license to operate.

How can duty holders improve their consultation practices?

The inspections undertaken in 2016 resulted in evidence of significant improvement in titleholder systems and practices in relation to consultation with relevant people.

In particular some titleholders had designed or adapted existing technological systems to record and monitor the consultation undertaken. In these instances monitoring compliance with commitments made in the environment plan, or to relevant people, was easily tracked to close out.

However, there is still room for improvement in some practices. These improvements were identified and addressed by NOPSEMA through recommendations and enforcements made through the inspection process. In summary, the areas where titleholder should continue to be vigilant about their consultation practices are:

- the process and ongoing need to periodically examine the set of relevant persons that are consulted with on an ongoing basis – some titleholders were exposed because of insufficient provisions in their processes to understand whether new stakeholders became affected or whether some were no longer affected
- the importance of sharing information with relevant persons in relation to changes in the knowledge base of the activity (e.g. new research) and changes to the activity (e.g. spatial/temporal changes to seismic surveys) – one titleholder experienced delays to their activity because of a failure in taking into account relevant research published after acceptance of the environment plan
- the importance of awareness of the effect of confirmation bias in proceeding with activities in changing circumstances. That is, some titleholders risked significant non-compliance due to interpreting stakeholder feedback in a manner that favours business interests at the expense of environmental management.

Inspections

Environmental management – financial assurance arrangements

What is financial assurance?

Arising from the Australian Government's commitment to implement its response to the June 2010 Report of the *Montara Commission of Inquiry*, amendments to the OPGGS Act were made to strengthen and clarify the responsibilities of titleholders undertaking petroleum activities.

One of these amendments was the strengthening of the requirement for titleholders to maintain sufficient financial assurance to meet all the costs, expenses and liabilities that may result in connection with carrying out petroleum activities – particularly in the event of an unplanned event such as a major oil spill.

The Environment Regulations were also amended to provide that NOPSEMA must not accept an environment plan, or a revision to an environment plan, unless NOPSEMA is reasonably satisfied that the titleholder has sufficient financial assurance.

In determining whether the financial assurance held by a titleholder is satisfactory, NOPSEMA considers whether the titleholder has adequately quantified the credible costs, expenses and liabilities that may arise from the petroleum activity. Titleholders must maintain sufficient financial assurance, as detailed in their accepted environment plan, throughout the duration of the petroleum activities they are undertaking. For more information see the 'Financial assurance' page at nopsema.gov.au.

Why are financial assurance arrangements an area of NOPSEMA inspection focus?

NOPSEMA has legislated functions to develop and implement strategies to monitor and enforce compliance with environmental management law (section 646 (gk) of the OPGGS Act).

The financial assurance provisions in the OPGGS Act are an environmental management law, and compliance is regulated consistent with NOPSEMA's compliance monitoring and enforcement policies which implement a graduated approach to enforcing compliance.

Specifically, NOPSEMA regularly inspects titleholder's financial assurance arrangements by checking that titleholders are implementing processes to quantify and maintain financial assurance throughout the life of the activity in accordance with the legislative requirements and take into account the information provided in the guideline.

How can duty holders improve the management of their financial assurance arrangements?

In 2016, inspection of titleholder financial assurance arrangements found two key areas where titleholders require improvement:

- maintaining a system or process to evaluate and ensure the level of financial assurance continues to be sufficient for the life of the title
- including review mechanisms that trigger checking of financial assurance at appropriate intervals or change to situation. NOPSEMA encourages titleholders to consider building review mechanisms into internal systems and process to trigger reviews of financial assurance at appropriate events or intervals, for example when joint venture arrangements are modified or where the scope of the activity is changed.

SPOTLIGHT

5.2 Spotlight – OHS – inspection recommendations

The purpose of conducting analysis is not only to provide operators with an overview of risk profiling within the oil and gas industry but, more importantly, to identify critical areas for improvement in NOPSEMA and industry's goal of ensuring that risks to members of the offshore petroleum industry workforce are reduced to ALARP. NOPSEMA inspectors prepare OHS inspection scopes in accordance with NOPSEMA's inspection policy available at nopsema.gov.au.

In 2016, NOPSEMA performed 93 OHS inspections across all facilities registered under the safety regulations. A total of 1021 recommendations and three written advice/warnings were also issued as a result of OHS weaknesses, deficiencies and findings from these inspections. The following analysis provides a high level overview of common issues identified by NOPSEMA during inspections of operators and their facilities.

Major accident events (MAEs)

NOPSEMA employs a risk-based methodology to identify inspection scopes. In 2016 the relevant risk factors, along with operator reported OHS incidents, triggered NOPSEMA inspection focus to assess the risk control measures associated with MAEs posing the highest level of risk. Three of the MAEs that contribute significantly to risk (and were therefore the focus of many NOPSEMA inspections) were loss of containment, dropped objects (lifting operations) and diving systems. These three inspections scope topics are identified as MAEs due to the nature of the potential consequences associated with the failure of risk controls.[12]

Key issues identified during inspection:

Loss of containment

- Mechanical damage through corrosion, erosion and natural ageing mechanisms on piping, valves and instrument / process air fittings.
- Safety-critical equipment such as emergency shutdown valves, blow down valves and pressure safety devices did not meet their performance standards e.g. leak rates, time to close, failure to close, etc.
- Maintenance management strategies in computerised maintenance management system (CMMS) were not aligned to safety-critical equipment assurance tasks as defined in the relevant Performance Standard.

Dropped objects (lifting operations)

- Deficiencies in the inspection, maintenance and certification of lifting equipment (including facility cranes).
- Performance standards developed for lifting equipment that are not aligned with the operator's lifting standards and procedures.
- Lifting equipment procedures and inspection checklists with inadequate content and lacking details of pass / fail criteria.

Diving systems

- Some DPPs did not adequately identify all the risks to divers, contrary to the risk identification and control measures in relevant permissioning documents (safety case and diving safety management systems).
- Deficiencies in relation to the monitoring and auditing of diving systems and equipment, and emergency response plans. In some cases it was also identified that duty holders failed to ensure that equipment was appropriately maintained and fit for purpose.

12 'Dropped objects'/'lifting operations' are generally identified as MAEs due to the nature of the hazard combined with the typical operating environment (e.g. lifting over and near oil and gas handling equipment). Consequently dropped objects hazards in a non-petroleum producing environment could be considered as a serious harm/single fatality consequence risk event.

Inspections

Failure mechanism contributors to the top three MAEs

Further analysis to identify 'failure mechanism contributors' provides operators more detail on some common inspection issues identified across oil and gas facilities. The use of the safe system of work model is utilised for the purpose of this exercise. The four categories within the model are: equipment failures, system failures, procedure failures and people failures.

Common failure mechanisms identified through NOPSEMA OHS inspections against the top three high-risk MAEs include:

Loss of containment

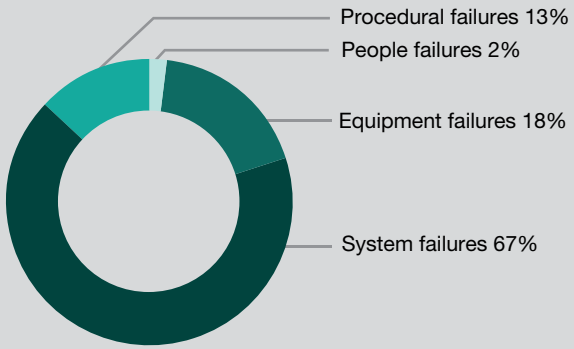


Figure 50.

Equipment failures (18% of recommendations):

- vibration and design issues on small bore tubing and piping
- critical function test failures on equipment such as shutdown and blowdown valves, transmitter devices installed on hydrocarbon service equipment and fire and gas alarm systems.

Dropped objects (lifting operations)

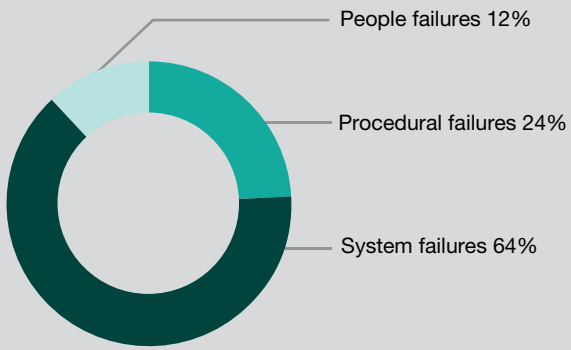


Figure 51.

System failures (64% of recommendations):

- lifting equipment inspection and testing strategy in the computerised maintenance management system (CMMS) not aligned with operator or original equipment manufacturer requirements
- inadequate monitoring and auditing of lifting equipment register and store to ensure ongoing fitness for purpose
- deficiencies in risk management to assess critical changes to lifting procedures, lifting equipment inspection frequency changes, dropped object protection and exclusion zones.

Diving systems

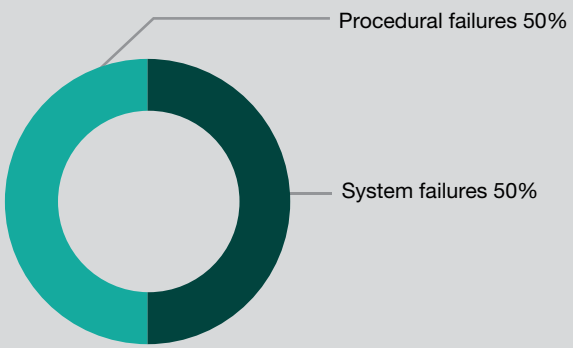


Figure 52.

System failures (50% of recommendations):

- inadequate diving system auditing and monitoring prior to and during diving activities, respectively
- diving operations not in accordance with industry-recognised International Marine Contractors Association (IMCA) guidelines.

Procedural failures (50% of recommendations):

- DPPs approved by operator of the diving project that are not compliant with the DPP content requirements outlined in regulation 4.16 of the Safety Regulations

Inspections

Loss of containment

System failures (67% of recommendations):

- CMMS maintenance strategy for safety-critical equipment not aligned with performance standard requirements
- Maintenance corrective action work requests in CMMS was not raised for equipment anomalies identified from inspections. Some examples noted are corrosion ingress on hydrocarbon service equipment, degraded or damaged safety-critical equipment and equipment not meeting function test requirements.
- inadequate monitoring and auditing of safety management systems for managing OHS risks.

Procedural failures (13% of recommendations):

- procedure for inspecting and testing safety-critical equipment deficient and not regularly reviewed
- Safety instrumented function (SIF) testing of safety-critical equipment did not comply with the safety integrity level (SIL) requirements as per IEC 61511.

People failures (2% of recommendations):

- competency-based training assessment not identified as a requirement to perform safety-critical work
- human error in maintenance task execution – in particular, isolation management.

Dropped objects (lifting operations)

Procedural failures (24% of recommendations):

- lifting operations procedural breaches such as failure to develop a lift plan, appropriate warning or no entry signage and exclusion zones
- procedures sometimes overlooked by facility operators during handling of third party lifting equipment
- lifting equipment procedures and inspection checklists inadequate in content and lacked details of pass/fail criteria.

People failures (12% of recommendations):

- operator error, such as incorrect slinging of load, storage and handling of lifting equipment
- ‘flick and tick’ of pre-used lifting equipment.

Diving systems

- operator action registers that inadequately manage non-conformances raised during IMCA audits.

Inspections

Safety management system elements

A safety management system (SMS) is a systematic approach to managing safety, including the necessary organisational structures, accountabilities, policies and procedures.

The design and operating effectiveness of an SMS are fundamental to how an operator manages risks. The main deficiencies noted in operator's SMS were in relation to maintenance management, station keeping/loss of position, emergency management, MoC and performance standards.

Key issues identified through NOPSEMA OHS inspections relating to the SMS include:

Maintenance management

- Inspection and maintenance strategy (task lists) identified in the maintenance management system not aligned with the 'assurance tasks' requirements detailed in relevant performance standards, leading to weaknesses in how safety-critical equipment is managed in terms of its functionality, availability, reliability and survivability.
- Inconsistencies observed in the regular monitoring and auditing of maintenance management systems specific to safety-critical equipmentmonitoring, inspection, maintenance, repair and replacement works.

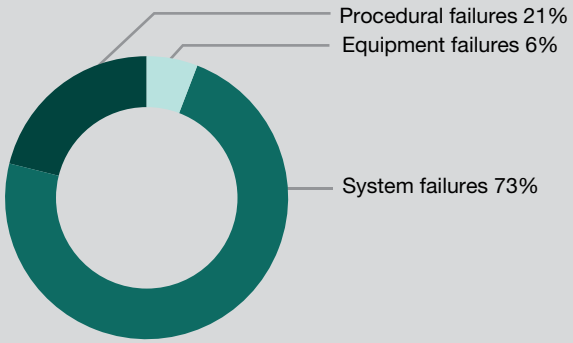


Figure 53.

Station keeping/loss of position

- Inadequate establishment and implementation of the inspection and maintenance tasks required to ensure mooring and dynamic positioning systems are reliable and fit for purpose. For example, gaps between CMMS maintenance execution plans and listed assurance tasks defined in the relevant performance standards.
- Personnel tasked with monitoring, maintaining and operating mooring and dynamic positioning systems with varying levels of competencies in their understanding of the systems in both normal and abnormal operation environment.

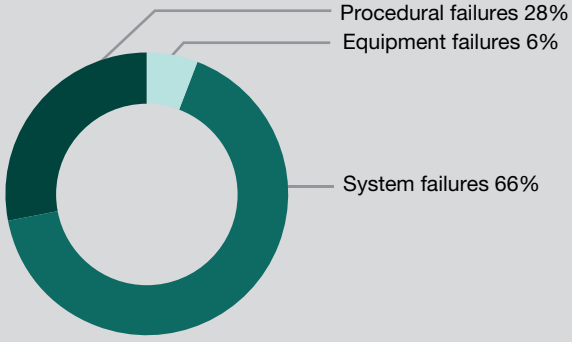


Figure 54.

Emergency management

- Assurance tasks identified in emergency management performance standards not identified as work management tasks in CMMS.
- Reliability issues on emergency management equipment such as fire pumps, deluge nozzles and valves, emergency lighting systems and corroded or restricted escape and evacuation routes.

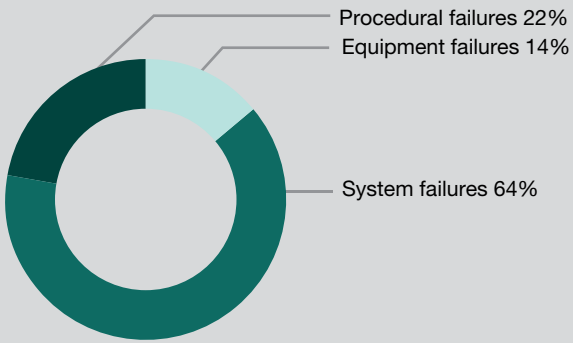


Figure 55.

Inspections

Maintenance management

Equipment failures (6% of recommendations):

- reliability issues noted in the management of functional requirements of fire and gas detection equipment
- end of field life equipment not maintained in accordance with operator's maintenance management strategies.

System failures (73% of recommendations):

- safety-critical equipment performance standards not aligned with CMMS maintenance tasks
- non-compliance with safety-critical equipment 'work management key performance indicators (KPIs) and metrics' and/or not adequately challenged/interrogated by the operator's senior leadership
- high backlog of safety-critical equipment maintenance tasks due to poor planning and scheduling
- safety-critical work orders closed without execution (also risk assessments and technical deviations not performed to assess impacts)
- management of pressure equipment inspection activities and corrective actions through a database/register without a CMMS interface.

Procedural failures (21% of recommendations):

- critical procedures for inspection and testing of safety-critical equipment not developed. In some cases this included insufficient content on the procedural steps to function test and inspect equipment
- performance standards for safety-critical equipment lacking clear and objective acceptance criteria (making it difficult to effectively and consistently measure their effectiveness).

Station keeping/loss of position

Equipment failures (6% of recommendations):

- corrosion management systems not identified and implemented on mooring systems
- inadequate definition and implementation of performance standard assurance activities to manage mooring systems.

System failures (66% of recommendations):

- performance standards for mooring, FPSO disconnect system, and propulsion and steering did not include the specific assurance tasks which ensure technical control measures are properly managed and maintained
- lack of regular planned and implemented drills/ exercises to ensure that personnel are trained and prepared in the event of an emergency loss of mooring
- inconsistencies in monitoring and auditing of mooring and DP management systems to ensure they are fit for purpose.

Procedural failures (28% of recommendations):

- inspection and maintenance procedures for mooring and DP systems not regularly reviewed or updated
- operators not being able to demonstrate critical procedures are fit for purpose and aligned with their standard operating procedures/guidelines.

Emergency management

Equipment failures (14% of recommendations):

- fitness for service issues associated with emergency escape and evacuation routes and emergency lighting
- equipment function failures on deluge nozzles and valves, fire main rings, and fire and gas detectors.

System failures (64% of recommendations):

- planning and scheduling of emergency management drills and exercises were conducted on an ad-hoc basis and could be regularised through a system based approach
- project emergency response plans for diving operations not adequate to manage risks arising from diving emergencies
- performance standards and associated assurance tasks for emergency equipment not integrated into the facility's CMMS frameworks.

Procedural failures (22% of recommendations):

- emergency management procedures not regularly reviewed and updated in the operators' document management systems
- procedures not developed to test or maintain emergency management equipment and systems.

SPOTLIGHT

5.3 Spotlight – environmental management – planned waste discharges

In 2016, NOPSEMA performed 15 environmental management inspections that included a planned discharges inspection scope. These inspections were targeted against the following petroleum activity types: operations (53%) and drilling (47%). Titleholders approach the management of planned discharges in a variety of ways – tailored to the specific operational circumstances, and the environmental setting, of their activities. NOPSEMA inspects titleholders to establish whether their particular planned discharges management measures are being implemented and are functioning appropriately. NOPSEMA issues recommendations where areas for improvement are identified and will commence enforcement action if non-compliance is identified.

In 2016, 46 recommendations issued across these 15 inspections required titleholders to address deficiencies with planned discharge management. Of these 46 recommendations, two key areas and one emerging area for improvement were identified (Figure 1):

- monitoring of planned emissions and discharges (52%)
- chemical selection (39%)
- water and sediment quality monitoring (9%).

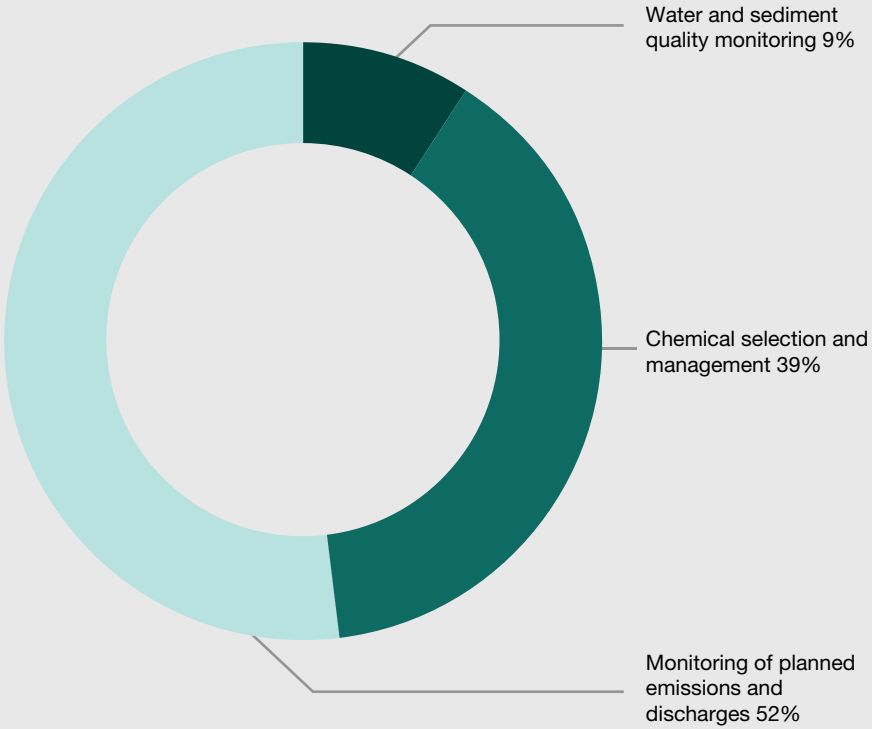


Figure 56.

Inspections

Key issues relating to planned waste discharges identified during NOPSEMA environmental management inspections include:

Monitoring of planned emissions and discharges

(52% of all planned discharges recommendations)

The accuracy and reliability of data used to report a quantitative record of emissions and discharges has been identified as one key area requiring improvement. Planned discharges are generally associated with 'end-of-pipe' emissions – with routine monitoring undertaken to quantify the volume and concentration of contaminants released for the purpose of ongoing compliance reporting. Examples may include the routine discharge of drill cuttings with residual hydrocarbon, operational discharges of produced formation water containing a broad range of chemical constituents, and dewatering events following the hydrotesting of a pipeline.

Common areas where NOPSEMA has identified improvement is required include:

- titleholder implementation of quality assurance procedures
- ongoing preventive maintenance and calibration of critical equipment
- data management and reporting
- initiation of adaptive management strategies.

Chemical selection and management

(39% of all planned discharges recommendations)

Chemicals used and discharged in the Australian offshore oil and gas industry may include those used in production chemicals, drilling muds, well cleaning fluids and cements. Most titleholders tend to utilise the 'Offshore Chemical Notification Scheme' (OCNS) as a management control for the selection of the least hazardous chemicals.

NOPSEMA inspections identified that, while the OCNS system is well established, titleholders can improve in the following areas:

- consideration for substitution warnings
- deriving 'equivalency' ratings in the absence of OCNS registered products
- understanding the chemical composition of products
- lessening reliance on OCNS as the only control for managing chemical discharges
- correct application of the Chemical hazard and risk management (CHARM) model and non-CHARM classification systems.

Water and sediment quality monitoring

(9% of all planned discharges recommendations)

In-situ monitoring of water and sediment quality around a production facility is undertaken as part of titleholder's obligation to continuously manage the impacts from planned discharges to levels which are acceptable and ALARP.

By comparison with previous years, an increased number of in-situ monitoring surveys were observed to be completed by titleholders in 2016, with a total of nine related recommendations being issued. Although constituting a relatively small number of the total planned discharge recommendations (12%), these are noteworthy given the potential benefits of monitoring in terms of increased awareness of environmental outcomes.

To ensure that in-situ monitoring surveys are adequate, NOPSEMA has identified the following emerging areas for improvement:

- monitoring program design, such as including sample analysis plan and parameters to be measured
- acknowledgement of historical contamination within the title area
- carrying out additional monitoring, when required, as an outcome of completed surveys
- caution in extrapolating between facilities based on single survey results.

SPOTLIGHT

5.4 Spotlight – environmental management – oil spill preparedness and response

Oil spills are a risk inherent in all offshore petroleum operations. NOPSEMA maintains a continued focus on oil spill preparedness and response through its risk based compliance activity in this area.

In 2016, NOPSEMA performed 22 environmental management inspections that included a spill risk inspection scope. These inspections were predominantly focused on operations (77%) and drilling (23%) activities, as they typically present the highest oil spill risk.

NOPSEMA inspects titleholders to establish whether appropriate oil spill preparedness and response capacity (systems, people and equipment), as demonstrated through approvals processes, are implemented, maintained and functional. NOPSEMA seeks to ensure titleholders are undertaking effective self-assurance/audit processes and maintaining the necessary training and competence to respond in the unlikely event of an oil spill. Recommendations are used to address non-compliance identified and also drive industry to adopt leading industry practice and seek continuous improvement.

In 2016, 119 recommendations issued were issued for these 22 inspections across five broad topic areas as identified in Figure 57:

- response arrangements and capability (54%)
- training and competency of incident responders (20%)
- other (13%)
- testing and exercising (8%)
- logistics and supply chains (5%).

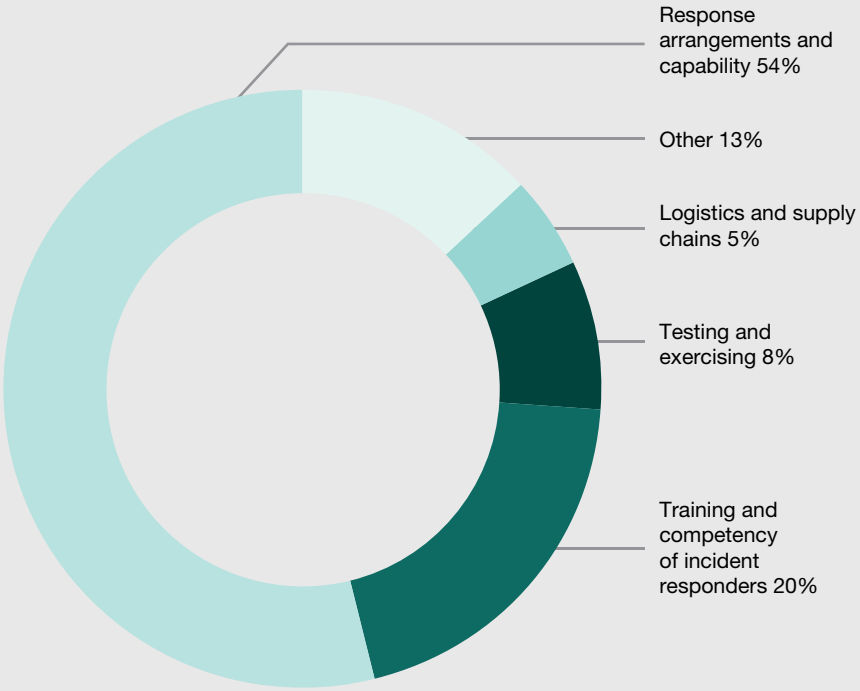


Figure 57.

Inspections

In addition to the above, and given the cooperative nature of oil spill response arrangements and the dependency of titleholders on oil spill response organisations (OSROs) to supply critical response equipment, NOPSEMA also undertook an inspection program across a cross-section of industry focusing on titleholder arrangements and assurance processes with two of the largest OSROs: the Australian Marine Oil Spill Centre (AMOSC) and Oil Spill Response Limited (OSRL). The inspection program also looked at the status of response equipment and management systems at AMOSC which is the principal non-government OSRO based in Australia.

Over the course of several weeks in October and November 2016, NOPSEMA inspectors visited the premises of seven titleholders, as well as AMOSC premises in Victoria and Western Australia. NOPSEMA inspectors examined titleholder assurance processes to verify OSRO capabilities as well as the availability and maintenance of AMOSC response equipment. This approach allowed inspectors to conduct a holistic examination of industry practice and enables industry to develop cooperative approaches to the recommendations where appropriate.

NOPSEMA inspectors issued several common recommendations across titleholders which fall into four improvement areas. They are:

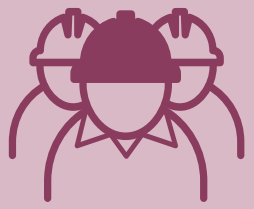
Clarifying service delivery requirements	Improving systems for testing and exercising OSRO arrangements and capability	Enhancing systems used to track the availability and maintenance of OSRO response resources	Enhancing assurance process through audits, assurance criteria, tracking and close out systems
• Establishing agreed level of service with OSRO's, including appropriate performance measures. • Ensuring suitable mechanisms are in place for decision making regarding resource requirements and stockpile locations.	• Ensuring the scope of oil spill response testing arrangements provides for appropriate testing of the expected roles and range of services provided by external OSROs, including relevant logistics.	• Ensuring assurance processes confirm OSRO capability and capacity (equipment, personnel, supporting logistics) meet EP requirements. • Ensuring equipment tracking and maintenance system are fully implemented and functional. • Regular communication regarding current availability of OSRO staff and the roles they can provide.	• Ensuring assurance systems holistically provide independent confirmation OSRO's are maintaining the required level of response capability and readiness to meet titleholder response requirements. • Reviewing audit processes and terms of reference against assurance requirements. • Ensuring appropriate assurance criteria (e.g. KPI's relevant to service level requirements and expectations) are applied to audits or inspections. • Ensuring audit systems allow the tracking, close out and communication of corrective action.

6. INVESTIGATIONS

NOPSEMA inspectors carry out investigations to assist NOPSEMA to consistently and efficiently fulfil its functions under the OPGGS Act. NOPSEMA will commence an investigation when it suspects, or becomes aware, of a potential non-compliance with the legislation. Events that may be investigated include accidents, dangerous occurrences, reportable environmental incidents and complaints. NOPSEMA will investigate those with responsibility under the offshore regulatory regime.

Responsible persons can include but are not limited to:

operators, titleholders, persons in control of parts of a facility or particular work, employers, manufacturers, suppliers, persons who are installing facilities or installing equipment, persons who provide accommodation for persons working on a facility, persons installing or operating pipelines, persons carrying out diving operations and any other persons who by their act or omission can create a risk or increase an existing risk to themselves or any other persons at or from a facility.



Generally investigations are initiated in response to incidents (that duty holders are required by law to notify and report to NOPSEMA). In 2016 NOPSEMA received and processed over 400 incident notifications, some of which were escalated to an investigation. There are differing levels of investigation.

There are differing levels of investigation:

Major investigation (commences immediately)	A major investigation will be conducted where information has been obtained or provided to NOPSEMA regarding an incident where an agreed threshold has been met and its relative seriousness will justify seeking evidence of non-compliance with principal legislation as a basis for enforcement. Investigations where there is the potential for prosecution on the completion of the investigation are considered major investigations.
Investigation is undertaken as soon as possible	These types of investigations are conducted to seek information regarding potential non-compliance with relevant legislation as a basis for enforcement other than prosecution.
Investigation is undertaken within 45 days	NOPSEMA's strategy selection for investigations consider the potential risk caused by the incidents compared with the benchmark risk (e.g. residual risk if the responsible party had taken all practicable measures to the reduce risk) associated with the particular circumstances.
Investigation is undertaken (at next planned inspection)	Follow-up investigation strategies range from inclusion in annual incident statistics to investigating the incident via an inspection with varying degrees of timing from an immediate inspection to inclusion of the investigation as part of the inspection scope of the next planned inspection.

NOPSEMA inspectors review incident data in the first instance to ensure there is sufficient factual information to consider the risks involved in the incident. NOPSEMA inspectors utilise their skills and experience in conjunction with available information about hazards and control measures to make an initial assessment of risk and the inherent risk gap. Consideration is given to removal of immediate risk, a return to compliance or possible enforcement action if

required. When a notification meets the major investigation threshold, an automatic escalation occurs supported by NOPSEMA management. Members of the investigation team are engaged and a forward plan is established. A lead inspector for the investigation is assigned, gathering sufficient evidence to establish whether or not there is a prima facie case that an offence has been committed against relevant offshore petroleum health, safety, environment or well integrity legislation. Investigations may result in NOPSEMA requiring duty holders to take corrective actions and may also result in NOPSEMA initiating enforcement action.

Investigation of complaints and information provided to NOPSEMA

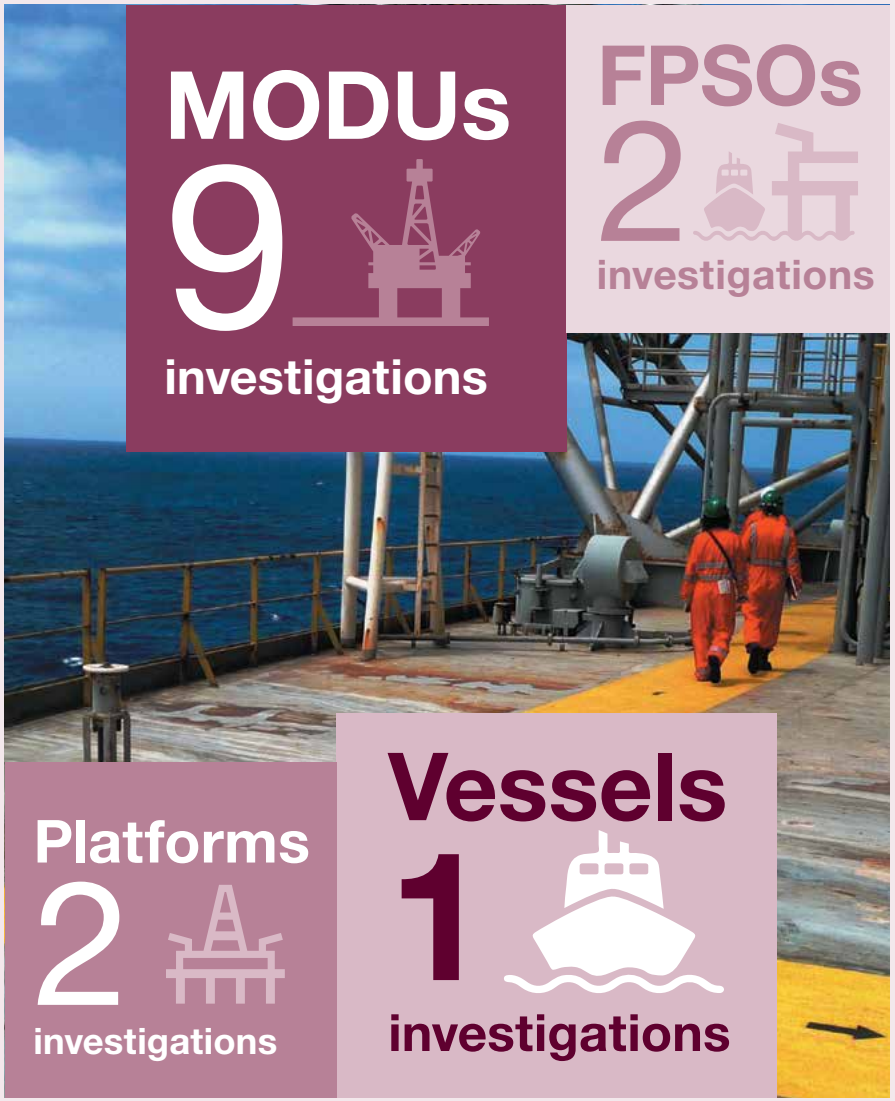
NOPSEMA also investigated circumstances where a complaint was made or information was provided to NOPSEMA. To protect the identity of complainants and informants and encourage continued reporting, NOPSEMA does not normally include details of complaint investigations in this report unless it is not possible to maintain the confidentiality of a complainant or informant. For more information about complaints, see Chapter 4.

6.1 Investigations of safety and integrity

There were no accidents or dangerous occurrences in 2016 that warranted NOPSEMA initiating a major investigation. Fourteen incidents had high risk categories and were subsequently investigated as a priority (including eight that related to dropped objects and/or lifting operations). The priority investigations were conducted at the following facility types:

- MODUs – nine investigations
- platforms – two investigations
- FPSOs – two investigations
- vessels – one investigation.

In addition, a further 117 incidents had a follow up decision of ‘investigate’. Of these, 87 (74%) had a linked inspection (i.e. planned follow up at the next periodic inspection visit to the facility). In 2016, a further 173 incidents were considered to have a minimal risk potential and were not investigated in detail. However, the information provided by the operator, such as root causes and preventative actions in the 3 day and 30 day reports provided to NOPSEMA, is included in Chapter 3.



Investigations

NOPSEMA has herein included information on five OHS investigations conducted in 2016 to share lessons learnt with the industry and other stakeholders.

Incident type:	Could have caused death or serious injury
Date:	February 2016
Nature of incident:	The 'surge' button was inadvertently de-selected from a dynamic positioning (DP) system (due to an object being placed on DP console) causing the vessel to drift over 40 metres. Diving operations were occurring at the time. This drifting meant that the diver who was in the water had to walk the umbilical along the seabed in the direction the vessel was traveling to ensure that the umbilical did not get fouled.
Immediate cause:	Human factors.
Root causes:	• Human error made possible by a weakness in design. • Infrequent audits and evaluation leading to insufficient management system oversight. • Inadequate training resulting in insufficient understanding of the safe operation of the DP system.
Corrective actions (OHS):	The operator implemented a number of actions in response to the incident, including: • sharing learnings from the incident across their organisation • DP system training and competency based verification • DP familiarisation process specific to human factors/human-machine interface • engineering solution to prevent inadvertent human-machine interface errors • improved monitoring, reviewing, auditing and compliance of DP management systems and processes.
Outcome of NOPSEMA investigation:	NOPSEMA has raised awareness of the incidents across the industry through safety alert 62 and The Regulator issue 1:2017, highlighting that: • Facility operators should regularly check their systems to ensure they are not susceptible to design-induced human error and ensure that suitable controls are in place to prevent, identify and adequately recover from this type of error • DP manufacturers should regularly review the built-in safe guards of their systems to ensure they provide sufficient protection, feedback and recovery against design-induced operator error.
Additional actions by NOPSEMA:	During future planned inspections of DP facilities, NOPSEMA's inspectors will continue to check control measures for DP systems. If sufficient protection against this foreseeable human error is not in place then NOPSEMA will consider taking further action in accordance with NOPSEMA's graduated approach to enforcement.

Investigations

Incident type:	Dropped object
Date:	April 2016
Nature of incident:	During a muster for the electrical shutdown of the platform, the main fire water pump tripped due to a hydraulic alarm fault. After repeated attempts to restart the pump, the back-up pump was started to ensure fire water capability during the shutdown. A short time later, a significant amount of water was noticed on the platform. On inspection, it was found that the fire water system air release valve (ARV) on the above upper deck had failed, resulting in the top flange shearing off the casing and the ball float being ejected upwards. These items deflected off the scaffold above, dislodging a scaffold board, coming to rest on the decks below. The ball float became wedged in the handrail near the ARV and the other items landed on the upper deck, 11 metres below the ARV. The items that fell included the top flange (19 kg), vacuum breaker elbow (6.3 kg), seat (1.1 kg) and graphite epoxy collar piece (1.6 kg).
Immediate cause	Surge within the system and a partially corroded ball float within the ARV which had subsequently filled with water.
Root causes:	• Inadequate quality control or acceptance testing. Specifically, the ball float within the ARV was poorly welded with evidence of a lack of fusion, which was not identified by vendor during manufacturing process leading to ingress of seawater/change in valve operation, dynamics and design. • Inadequate procedures and safe work practices. Specifically system procedures were in place and used, but failed to adequately specify or highlight the requirement for the system to be liquid filled prior to operation of the fire water pumps. Further, the maintenance work instructions for the ARV were developed task-specific and not implemented in the maintenance management system. • The MoC process was not utilised. Depressurisation of the fire water system due to valve flushing and the leaking non-return valve were not properly considered in relation to the compounding effect the black start test and subsequent starting of the FWPs would have on system pressure.
Corrective actions (OHS):	The operator implemented a number of actions in response to the incident, including: • reinforcing the requirements of the MoC and risk assessment processes • aligning preventive maintenance activities to meet the manufacturers' recommendations • reviewing all relevant firewater pump and firewater distribution systems' operating and maintenance procedures • inspection and replacement of the affected branch damage for the fire ring main before returning it to service • conducting a design review of the ARV and subsequent piping (ring main) for suitability in the event of a zero pressure start.
Outcome of NOPSEMA investigation:	NOPSEMA conducted an inspection of the facility to investigate the incident. The inspection assessed the operator's incident root cause analysis and action outcomes. All actions identified by the operator were verified by NOPSEMA as implemented and closed.

Investigations

Incident type:	Uncontrolled hydrocarbon release
Date:	February 2016
Nature of incident:	Two gas detectors on the facility detected gas at 20% of the lower explosive limit. The night shift operator investigated the alarms and observed gas in the area. In response the operator initiated the emergency shut-down system and commenced deluge of the area before proceeding to the temporary refuge. The process control system was activated from the emergency assembly area to depressurise process inventories. All personnel were mustered and accounted.
Immediate cause:	It was identified that the gas release occurred from a hole in the body of a choke valve.
Root causes:	• The maintenance procedure did not specify the requirement to raise corrective maintenance work orders on equipment anomalies identified during maintenance work order execution. • The choke had been omitted from the previous choke inspection list.
Corrective actions (OHS):	The operator implemented a number of actions in response to the incident, including: • reviewing the workflow of choke inspection process to ensure clear definition of roles and responsibilities • implementing a system change to ensure corrective maintenance work notifications and work orders are raised in instances where a choke replacement is required • implementing a tag out process for chokes where a well is not planned to be flowed in next 12 months or has not been inspected for > 24 months.
Outcome of NOPSEMA investigation:	NOPSEMA conducted an inspection of the facility to investigate the incident. The inspection assessed the operator's incident root cause analysis and action outcomes. All actions identified by the operator were verified by NOPSEMA as implemented and closed.
Additional actions by NOPSEMA:	NOPSEMA made the following recommendation in connection with this investigation: "Operator to consider investigating reasons for infrequent well and sand testing of well over the last 4 years".

Investigations

Incident type:	Uncontrolled hydrocarbon release
Date:	May 2016
Nature of incident:	During daily rounds, while inspecting the water injection pump turbine enclosure the process operator could smell gas. The process operator returned with a gas monitor and found a leak coming from tubing into a pressure transmitter, and immediately notified supervisor. The gas monitor registered 100% lower explosive limit (LEL) at 100mm and 30% LEL at 1 metre.
Immediate cause:	Fitting cross threaded during maintenance work. Peer checking records and start-up checks of disturbed fittings were not recorded as per procedure.
Root causes:	• Maintenance procedure not followed and had steps crossed out without approval and sign-off from the planning and maintenance coordinator. The maintenance procedure related to the fuel gas start-up procedure and adherence to this procedure would likely have identified the gas leak. Further, the procedure was not attached to the maintenance work order and work permit as required in the turbine start-up procedure.
Corrective actions (OHS):	The operator implemented a number of actions in response to the incident, including: • implementing facility turbine fitting check sheets into the facility's maintenance procedures (including the requirement for peer checking of maintenance work) • requiring the use of tube fitting gauges for the peer checks of fittings post maintenance • refresher training for all production and maintenance technicians to emphasise the importance of following all procedural steps even where there is a delay in getting the final steps completed • updating the operations turbine start-up procedure to capture best practice for post-intrusive maintenance start-up • designating the procedure as an integrity critical operating procedure.
Outcome of NOPSEMA investigation:	NOPSEMA conducted an inspection of the facility to investigate the incident. The inspection assessed the operator's incident root cause analysis and action outcomes. All actions identified by the operator were verified by NOPSEMA as implemented and closed.

Investigations

Incident type:	Damage to safety critical equipment
Date:	August 2016
Nature of incident:	During the six monthly testing of the galley heat detectors, initiation of the general platform alarm from the integrated control system did not occur as expected (i.e. there was no audible tone). This occurrence was treated as failure of safety critical communication system and a failure to meet performance standard.
Immediate cause:	Communication failure of all audible alarms.
Root causes:	• Functionality of the alarm system on the integrated control system software had not been tested after software updates. • Software update procedures did not include testing of audible alarms after software updates had been completed.
Corrective actions (OHS):	The operator implemented a number of actions in response to the incident, including: • restoring the functionality of the alarm system by rebooting the integrated control system software • revising software change/update procedures to include testing of audible alarms after completion of software updates or changes.
Outcome of NOPSEMA investigation:	NOPSEMA conducted an inspection of the facility to investigate the incident. The inspection assessed the operator's incident root cause analysis and action outcomes. All actions identified by the operator were verified by NOPSEMA as implemented and closed.

6.2 Investigations of environmental management

There were no environmental incidents reported in 2016 that warranted NOPSEMA initiating a major investigation.

NOPSEMA received notification of eight reportable environmental management incidents in 2016.

All were reviewed and assessed as per the NOPSEMA non-major investigation policy and procedure:

- One was followed up as part of the planned inspection program within 45 days. This investigation is outlined below
- Seven were included in the annual report statistics and data analysis, but were deemed to require no further action following the initial non-major investigation. Reasons for these decisions include that satisfactory information was provided at the time of notification; satisfactory corrective actions had been implemented; there was a change in titleholder for a facility; and/or it was determined that there was a lack of ongoing risk to the environment. Examples of these are included below.

NOPSEMA has herein included information on several environmental investigations conducted in 2016 to share lessons learnt with the industry and other stakeholders. In addition to the above reportable incidents, NOPSEMA received one complaint regarding environmental management in 2016 (see Chapter 4 of this performance report). This was evaluated through NOPSEMA's complaints process, and has been summarised below for additional information.

Notification type:	**Reportable environmental incident – leak discovered during routine subsea inspection**
Date:	April 2016
Nature of information:	ROV inspection work was being conducted on a wellhead after FPSO departure, when a hydrocarbon leak was identified. The leak was traced to the SSSV control module on the well head; and the ROV closed the hydraulic control line isolation to the SSSV which prevented further loss of containment. The root cause was identified as SSSV seal degradation.
Outcome of NOPSEMA investigation:	The incident was reported to NOPSEMA as an environmental incident, a dangerous occurrence, and a reportable incident in relation to a well. As a result, NOPSEMA took a consolidated approach and the investigation and root cause analysis was further addressed by the Safety and Integrity Division at NOPSEMA.
Enforcement action:	Inspection recommendation issued to the titleholder.

Investigations

Notification type:	Reportable environmental incident – hydrocarbon release
Date:	May 2016
Nature of information:	A gas detector was activated in the vicinity of a gas compressor on a production facility. The compressor was shut down and production from the field stopped. A further investigation identified a gas leak on a fuel gas line where a pipe fitting had not been tightened up following recent maintenance, resulting in a topside release of approximately 1 kg of gas. Gas detectors operated and appropriate action was taken to avoid environmental impact.
Outcome of NOPSEMA investigation:	The incident was deemed to constitute an isolated incident with minor environmental impact, given that it was detected and addressed promptly. Proper maintenance practice could be expected to include correct fitting of pipes and checking to ensure no leaks in future.
Enforcement action:	None required.

Notification type:	Environmental management complaint – application of change management processes
Date:	September 2016
Nature of information:	NOPSEMA received a complaint from a rock lobster fishery association regarding potential impacts of seismic activity to rock lobster populations, in relation to a seismic survey which had been accepted by NOPSEMA and was due to proceed. The complaint outlined that the complainant believed the titleholder had not adequately considered the potential impacts, and had not implemented sufficient mitigation measures as requested by relevant persons through the consultation process.
Outcome of NOPSEMA investigation:	NOPSEMA conducted an inspection of the titleholder prior to the seismic survey commencement, and considered the titleholder's management of ongoing consultation and response to new information about potential environmental impacts. It was found that additional risk assessment and consideration of additional mitigation measures by the titleholder was required to ensure the impacts from the survey were reduced to ALARP and acceptable levels.
Enforcement action:	NOPSEMA issued a general direction to conduct the additional evaluation prior to proceeding with the activity; and then a prohibition notice to ensure compliance with the additional environmental commitments contained in the titleholder's response to the general direction. NOPSEMA has raised awareness of the importance of proper application of change management processes across the industry through Environment alert 1, which can be viewed at nopsema.gov.au.

Notification type:	Reportable environmental incident – hydrocarbon release from ‘clean water’ discharge tank
Date:	November 2016
Nature of information:	Visible sheen was noticed on the surface of the water in the area of a drilling rig and reported to NOPSEMA. The discharge originated from the clean water discharge tank, which contained deck drain water. It was identified that the oil discharge sensor feed tube had become blocked, preventing the sensor from detecting hydrocarbons.
Outcome of NOPSEMA investigation:	The incident and associated corrective actions were incorporated into the scope of NOPSEMA’s inspection of the activity. It was found that preventive maintenance system instructions regarding the cleaning and calibration of the oil discharge sensors were ambiguous, and it was not clear that all required checks had been undertaken.
Enforcement action:	Inspection recommendation issued to the titleholder.

7. ENFORCEMENTS

NOPSEMA takes action to enforce compliance (enforcement action) when it identifies non-compliance with obligations imposed by the OPGGS Act and associated regulations, or when it identifies the need for improvements in duty holders' safety, well integrity or environmental management performance. Enforcement action is also taken when there is an immediate and/or significant threat to the health and safety of a person or to the environment.

In all enforcement actions, the ultimate intent is to bring the duty holder back into compliance with the relevant legislation. Continued non-compliance that is subject to an enforcement action can result in escalation of the initial action with criminal and civil penalties being pursued as appropriate. For more information about NOPSEMA's enforcement policy, see the 'Enforcement' page at nopsema.gov.au.

During 2016...

10 enforcement actions were issued to 6 duty holders

2 EM prohibition notices and **2** directions were issued

3 OHS written advice/ warnings were issued

3 requests for environment plan revisions were issued

Enforcements

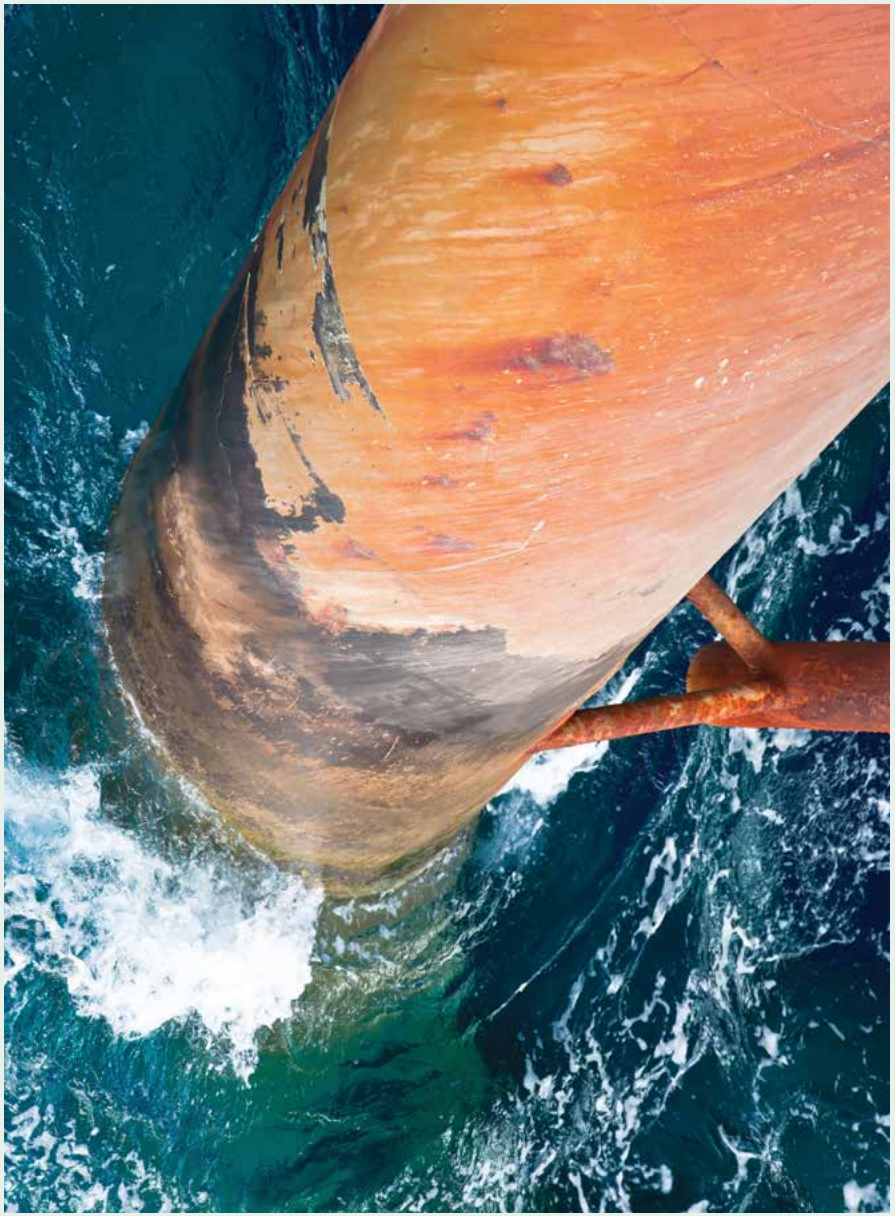
Compliance tools available to NOPSEMA:

- prohibition notices
- improvement notices
- prosecution
- injunctions
- civil penalties
- do not disturb notices
- directions
- infringement notices
- request to revise a permissioning document
- withdrawal of acceptance of a permissioning document

NOPSEMA inspectors are guided by NOPSEMA policy when choosing appropriate enforcement action(s) to obtain a duty holder's compliance with the legislation. The ability to select from a range of enforcement actions, depending upon the severity of the misconduct or breach of statutory requirements, enables the application of an appropriately proportionate and targeted enforcement action which can also be directed at achieving future behavioural change, in addition to a return to compliance. The range of enforcement actions also allow NOPSEMA inspectors to determine an initial enforcement expectation in each case and modify it if required based on a range of potentially material factors. NOPSEMA's enforcement actions are informed by:

- assessments
- planned inspections
- investigations and reporting of accidents, dangerous occurrences and reported environmental incidents
- investigation of complaints
- duty holder compliance history and previous enforcement actions
- Australian and international incidents
- industry trends.

Of the 10 enforcement actions taken by NOPSEMA in 2016, three were related to OHS issues and seven to environmental management issues.



SPOTLIGHT

Compliance Strategy

In 2016 NOPSEMA introduced a new Compliance Strategy. NOPSEMA's Compliance Strategy is a strategic policy document that outlines the compliance framework and principles applied by NOPSEMA in undertaking its regulatory activities. The strategy aims to ensure that offshore petroleum activities are carried out in a safe and environmentally responsible way by encouraging, monitoring and enforcing compliance with the law. NOPSEMA's approach to compliance is reflected in its core and non-core regulatory activities comprising advice and promotion, assessment, inspection, investigation, and enforcement. The Compliance Strategy explains the linkages between these activities and how regulatory intelligence is used to improve safety and environmental outcomes.

For more information on NOPSEMA's Compliance Strategy, see the 'Compliance Strategy' page at nopsema.gov.au.

Published notices

Clause 80 AA of Schedule 3 and Clause 12 A of Schedule 2A to the OPGGS Act requires that NOPSEMA must publish on its website a prohibition notice or an improvement notice within 21 days after the notice is issued. The provisions for publication do not apply to any other types of notices, letters or enforcement actions that may be issued by NOPSEMA or NOPSEMA inspectors. A prohibition notice ceases to have effect when a NOPSEMA inspector notifies the responsible person that the inspector is satisfied that adequate action has been taken to remove the threat to health and safety or the environment specified in the notice. An Improvement Notice ceases to have effect when the responsible person takes the action that is specified in the notice.

Published notices are not removed from the website when they cease to have effect. The purpose of leaving notices on the website is to enable lessons learned from inspections to be shared with other members of the offshore petroleum industry, which in turn assists the industry as a whole to improve its performance and comply with its regulatory requirements. NOPSEMA ensures that, as far as is reasonably practicable, all personal information as defined in the *Privacy Act 1988* is redacted from the notice before it is published.

To view published notices, see the 'Published notices' page at nopsema.gov.au.

APPENDIX 1 – CLASSIFICATION OF FATALITIES AND INJURIES

Code	Category	Definition
FT	Fatality	Any work-related death that occurs within one year of the incident: • includes missing persons • does not include fatalities that are due to natural causes.
MI	Major injury	• Any work related injury that results in: • amputation: includes whole or partial amputation of parts of the body (does not include loss of fleshy tip of finger, nail, or tooth) • skeletal injuries: includes bone fractures (including chipped or cracked bone or hairline fractures) and dislocation • burns: only if the injured person becomes unconscious, is admitted to hospital, or requires resuscitation • injuries to internal organs: only if the injured person becomes unconscious, is admitted to hospital, or requires resuscitation • eye injuries resulting in loss of sight (permanent or temporary) • eye injuries resulting in a penetrating eye injury or a chemical or hot metal burn to the eye • any acute illness caused by exposure to harmful chemicals or biological agents and physiological effects e.g. decompression illness, loss of hearing, and radiation sickness • hypothermia or heat-induced illness (unconsciousness) • any injury resulting in unconsciousness, resuscitation, or admittance to hospital.
LTI ≥3	Lost time injury ≥3 days	Any work-related injury (other than a 'major injury') which results in a person being unfit for work on any day[13] after the day of occurrence of the injury and remains off work for three days or more.
LTI <3	Lost time injury <3 days	Any work-related injury (other than a 'major injury') which results in a person being unfit for work on any day[14] after the day of occurrence of the injury and remains off work for one or more days but less than three days.
ADI	Alternative duties injury	Any work-related injury (other than a 'major injury') which results in a person being unfit for full performance of their regular job on any day after the occupational injury. Work performed might be: an assignment to a temporary job, part-time work at the regular job or working full-time in the regular job, but not performing all the usual duties of the job. Where no meaningful work is being performed, the incident should be recorded as a lost workday case.
MTI	Medical treatment injury	Cases that are not severe enough to result in lost work day cases or alternative duty cases but are more severe than requiring simple first aid treatment.

Note: For more information about these codes and categories, see NOPSEMA's guidelines – 'N0300 – GL0033 – Guideline on monthly reporting – deaths and injuries' under the 'Safety - Reporting Accidents and Dangerous Occurrences – Forms – Monthly Summary Report' at nopsema.gov.au.

13 'Any day' includes rest days, weekend days, leave days, public holidays, or days after ceasing employment.
14 'Any day' includes rest days, weekend days, leave days, public holidays, or days after ceasing employment.

APPENDIX 2 – INJURY GROUPS

Group code	Group name	Category	Category name
TRCs	Total recordable cases	LTI ≥3 days	Lost time injury of three or more days
		LTI <3 days	Lost time injury of less than three days
		ADI	Alternative duties injury
		MTI	Medical treatment injury
LTIs	Lost time injuries	LTI ≥3 days	Lost time injury of three or more days Lost time injury of less than three days
MTI	Medical Treatment Injury	MTI	See Guidance –GL0033
ADI	Alternative Duty Injury	ADI	See Guidance –GL0033

Note: For more information about these codes and categories, see NOPSEMA's guidelines – 'N0300 – GL0033 – Guideline on monthly reporting – deaths and injuries' under the 'Safety - Reporting Accidents and Dangerous Occurrences – Forms – Monthly Summary Report' at nopsema.gov.au.

APPENDIX 3 – ROOT CAUSES

The following definitions of root cause categories are summarised and adapted from the TapRoot Root Cause Tree Dictionary. They are provided for general information only and do not represent a complete or exhaustive definition of each category.

Root causes		
Equipment difficulty	Design	A design problem caused the equipment to fail, where design was conducted in-house, or where in-house engineers participated in the design.
	Equipment parts/defects	Parts or equipment were defective before installation due to problems in manufacturing, procurement, shipping and handling, storage, and/or quality assurance.
	Management systems - equipment	Failure to implement effective corrective actions for known deficiencies.
	Preventive maintenance	Equipment difficulty could have been prevented had a sound preventive maintenance plan been in place
	Tolerable failure	Category reserved for failures that are of such low consequence and frequency that corrective actions are not deemed necessary.
Human performance difficulty	Communications	Lack of communication, or communication error, between people performing work, or between supervisor and personnel.
	Human engineering	An issue was caused by poor or undesirable human factors engineering and/or ergonomics; namely, human-machine interface problems, poor work environment, system complexity, non-fault tolerant system.
	Management systems - people	An issue could have been prevented through better standards, policies, or administrative controls; or through appropriate use of existing standards, policies, and administrative controls.
	Procedures	Performance would have improved with the use of a well-written procedure.
	Quality control	Formal, independent inspection of work was not conducted, or was poorly conducted.
	Training	Performance would have improved had the person received better training in task understanding, skill development, or maintenance of skill and knowledge.
	Work direction	An issue could have been prevented through reasonable preparation and supervision of work.
Other	N/A or none	Operator did not identify root cause or was not applicable for the incident.
	Other	The root cause is not provided for in the other categories.

APPENDIX 4 – INCIDENT NOTIFICATION CLASSIFICATION SCHEME

Incident type			
OHS incidents	Accidents	• Death or serious injury • Incapacitation ≥3 days LTI	
	Dangerous occurrences	• Could have caused death or serious injury • Could have caused incapacitation ≥3 days LTI • Fire or explosion • Collision – marine vessel and facility • Uncontrolled HC release >1-300 kg • Uncontrolled HC release >300 kg • Uncontrolled PL release >80-12 500 L • Uncontrolled PL release >12 500 L	• Unplanned event – implement ERP • Damage to safety-critical equipment • Other kind needing immediate investigation • Pipeline – kind needing immediate investigation • Pipeline – substantial risk of accident • Pipeline – significant damage • Well kick >50 barrels
Well integrity incidents		• Loss of integrity >1 kg gas released • Loss of integrity >80 L liquid released • Failure of hydrostatic pressure - BOP closure and positive well pressure • Loss of integrity - well-related equipment damage or failure • Potential loss of integrity - well-related equipment damage/failure • Loss of well control - any other unplanned occurrence	
Environmental incidents	Reportable	• Hydrocarbon vapour/petroleum fluid release • Chemical release • Drilling fluid/mud release • Fauna incident • Matters protected under Part 3 of the *Environment Protection Biodiversity Conservation Act 1999* • Other	
	Recordable	• Non-hydrocarbon air emissions • Hydrocarbon gas release/air emissions • Hydrocarbon spill <80 L • Chemical spill • Other unplanned liquid discharge • Spill to deck – no discharge to marine environment • Non-conformance with planned discharge	• Solid waste discharge/dropped object • Injury or death – fauna • Seabed/benthic damage • Equipment not functioning • Breach of procedural control • Other

APPENDIX 5 – DATA TABLES

1 Industry activity

Active dutyholders

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Facility operators (OHS)	30	30	35	34	41	36	39	36	32	35	38	32

Active facility types

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Platforms	54	54	53	55	60	58	57	32	31	32	26	34
FPSOs/FSOs	12	13	14	14	14	15	14	13	11	11	13	10
MODUs	16	13	14	15	19	14	16	12	12	12	11	8
Vessels	10	9	11	12	17	10	13	14	12	17	17	12
Pipelines	6	16	68	68	70	110	109	80	83	76	81	85
Total	**98**	**105**	**160**	**164**	**180**	**207**	**209**	**151**	**149**	**148**	**148**	**149**

Total offshore hours worked

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Fixed	6,045,187	5,489,338	5,183,438	5,541,693	6,030,100	7,372,400	7,197,149	7,359,360	5,958,080	5,468,071	5,822,613	6,269,468
Mobile	3,668,039	4,511,902	6,037,559	7,452,468	8,712,551	6,040,231	6,942,732	8,323,697	7,400,623	9,375,803	9,881,917	3,427,649
Total	**9,713,226**	**10,001,240**	**11,220,997**	**12,994,161**	**14,742,651**	**13,412,631**	**14,139,881**	**15,683,057**	**13,358,703**	**14,843,874**	**15,704,530**	**9,697,117**

APPENDIX 5 – DATA TABLES (CONT'D)

1 Industry activity (cont'd)

Fixed active facilities by nearest state – 2016

State	Facility Type	Total	%
Vic.	Pipeline	53	74.6
	Platform - NA	10	14.1
	Platform - NNA	8	11.3
	Vic. Total	**71**	**55.0**
WA	FPSO	9	18.8
	Pipeline	26	54.2
	Platform - NA	6	12.5
	Platform - NNA	7	14.6
	WA Total	**48**	**37.2**
NT	FPSO	1	16.7
	Pipeline	4	66.7
	Platform - NNA	1	16.7
	NT Total	**6**	**4.7**
Tas.	Pipeline	2	50.0
	Platform - NA	1	25.0
	Platform - NNA	1	25.0
	Tas. Total	**4**	**3.1**
Grand Total		**129**	**100.0**

Seismic activities by nearest state – 2016

State	Total	%
WA	5	62.5
NT	3	25
Vic.	1	12.5
Total	**8**	**100**

2 Assessments and submissions

Submissions by division – key permissioning documents*

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
OHS	103	130	124	168	147	111	196	142	91	96	109	76
WI							29	31	32	32	30	45
EM								103	119	75	44	32
PSZ								10	5	10	4	8

***Key permissioning documents include:**

OHS: safety cases, diving safety management systems, pipeline safety management plans (from 2012 the requirement to submit Pipeline SMPs was superseded by the requirement for pipelines to have an accepted safety case).

WI: well operations management plans.

EM: environment plans and offshore project proposals.

PSZ: petroleum safety zone applications.

2 Assessments and submissions

Submissions by division

	Assessment type	Sub-types	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Occupational health and safety	Safety cases	Safety case new	18	12	21	29	17	26	25	27	20	28	27	14
		Safety case revised	68	105	93	109	110	74	151	106	69	62	75	59
	Diving	Diving project plan	14	9	1	0	0	0	0	0	0	0	0	0
		Diving SMS new	0	0	2	2	6	5	6	5	1	0	2	0
		Diving SMS revised	10	0	1	4	2	1	3	4	1	6	5	3
		Diving start-up notice	-	-	-	-	-	-	-	23	24	20	8	8
	Other	Pipeline SMP new*	6	11	3	7	2	2	2	N/A	N/A	N/A	N/A	N/A
		Pipeline SMP revised*	1	2	4	17	10	3	9	N/A	N/A	N/A	N/A	N/A
		Proposed pipeline management plan*	0	1	0	5	1	1	-	-	-	-	-	-
		Scope of validation	1	2	21	78	46	53	63	55	45	49	54	44
		Request for exemption	0	0	2	2	1	0	0	0	0	0	0	0
Well integrity	Well operations management plans	WOMP new							28	27	26	23	21	45
		WOMP variation							1	4	6	9	9	0
		Well activity application							141	162	87	130	107	59
		Final abandonment report							-	-	-	-	-	6
Environmental management	Environment plans	Environment plan new								92	79	57	37	20
		Environment plan revised								11	40	18	7	11
		Environment plan summary								-	-	-	-	24
		End of an environment plan (Reg 25A)								-	-	11	9	15
		Offshore project proposals								-	-	0	0	1
Petroleum safety zones	Safety zones	PSZ application new								7	3	10	2	1
		PSZ application variation								3	2	0	2	7
		PSZ access application								0	1	0	0	1
		ATBA access application								5	5	0	11	0
Other	Advise	Regulatory advice to other agencies	5	10	5	4	1	0	6	6	18	56	21	45
Total			**126**	**157**	**164**	**265**	**202**	**167**	**439**	**537**	**427**	**479**	**397**	**363**

*From 2012 the requirement to submit Pipeline SMPs was superseded by the requirement for pipelines to have an accepted safety case.

APPENDIX 5 – DATA TABLES (CONT'D)

2 Assessments and submissions (cont'd)

Assessments notified within legislated timeframes – key permissioning documents

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
OHS	62%	51%	56%	52%	78%	84%	91%	99%	97%	100%	97%	100%
WI							96%	100%	100%	97%	100%	100%
EM								99%	100%	100%	100%	100%
PSZ								100%	100%	100%	75%	100%

Assessments not accepted

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
OHS	2%	3%	6%	9%	12%	14%	30%	30%	20%	27%	26%	24%
WI							3%	2%	2%	3%	3%	6%
EM								10%	2%		4%	3%

Safety cases by facility type

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
MODUs	31	49	56	68	62	33	45	39	21	29	34	15
Vessels	21	16	12	19	27	22	25	23	22	23	26	19
Pipelines					2	9	51	11	10	9	16	11
Platforms	23	37	35	28	14	19	38	35	18	20	13	13
FPSOs	8	12	9	22	21	15	14	25	18	9	13	15

Safety cases rejected

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
% rejected	2.70%	3.23%	6.31%	10.69%	10.83%	12.50%	32.39%	30.46%	22.99%	25.26%	23.71%	24.00%

Average safety case assessment timeframes (days)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
New	81	76	80	110	97	162	243	90	110	58	79	82
Revision	45	42	44	36	39	51	50	45	42	44	33	43

APPENDIX 5 – DATA TABLES

Well operations management plans rejected

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
% rejected							11.54%	-	3.33%	9.68%	3.45%	6.45%

Average well operations management plan assessment timeframes (days)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
New	81	76	80	110	97	162	243	90	110	58	79	82
Rivision	45	42	44	36	39	51	50	45	42	44	33	43

Average well operations management plan assessment timeframes (days)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
New							23	22	38	28	15	40
Variation							15	17	22	16	9	

Submitted environment plans – activity type

	2012	2013	2014	2015	2016
Construction	7	13	2	1	0
Decommissioning	1	0	1	1	2
Drilling	42	32	23	9	5
Operations	3	27	15	5	10
Other	17	24	12	6	3
Seismic	33	22	22	22	11

Environment plans rejected

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
% rejected								9.23%	4.95%	-	3.92%	3.13%

Average environment plan assessment timeframes (days)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
New								111	98	105	139	128
Variation								220	217	103	52	92

APPENDIX 5 – DATA TABLES (CONT'D)

3 Incidents

Total accidents

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Accidents	21	34	32	47	41	43	29	21	13	9	12	4

Accidents by facility type

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
FPSOs	6	10	3	6	6	10	2	7	2	3	3	0
MODUs	6	12	14	23	12	16	12	4	8	1	3	2
Other	1	0	2	3	0	0	0	0	0	0	0	0
Pipelines	0	0	0	0	0	0	0	0	0	1	0	0
Platforms	6	10	6	4	7	12	7	7	3	1	2	2
Vessels	2	2	7	11	16	5	8	3	0	1	4	0

Accidents basic causes - OHS

	2013	2014	2015	2016
Work direction	25%	13%	16%	67%
Human engineering	10%	13%	32%	17%
Training	0%	0%	0%	17%
Design	23%	20%	8%	0%
Management systems - people	5%	0%	8%	0%
Preventive maintenance	5%	0%	8%	0%
Procedures	18%	20%	20%	0%

Total dangerous occurrences

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Dangerous occurrences	133	173	231	357	307	346	306	383	356	348	364	302

APPENDIX 5 – DATA TABLES

Dangerous occurrences by facility type

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
FPSOs	33	29	68	146	105	161	123	172	167	168	194	169
MODUs	50	63	74	84	63	53	37	53	65	53	50	25
Other	7	8	5	7	6	9	8	0	0	0	0	0
Pipelines	0	1	1	0	0	0	2	0	2	2	3	1
Platforms	32	67	75	105	80	111	113	145	120	110	97	101
Vessels	11	5	8	15	53	12	23	13	2	15	20	6

Dangerous occurrences basic causes - OHSS

	2013	2014	2015	2016
Preventive maintenance	13%	15%	21%	19%
Design	28%	20%	13%	17%
Procedures	12%	14%	17%	14%
Equipment parts/defects	6%	10%	16%	14%
Human engineering	9%	11%	6%	9%
N/A or none	7%	7%	6%	7%
Tolerable failure	2%	5%	8%	0%

OHS Hydrocarbon releases

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Uncontrolled HC release > 1-300kg	11	15	21	18	15	22	18	13	19	20	12	18
Uncontrolled HC release > 300 kg	1	3	1	3	5	3	2	3	0	3	2	1
Uncontrolled PL release > 80-12 500 L	0	1	6	2	3	7	9	1	1	2	4	4
Uncontrolled PL release > 12 500 L	0	0	0	0	1	0	0	0	0	0	0	0

APPENDIX 5 – DATA TABLES (CONT'D)

3 Incidents (cont'd)

Hydrocarbon releases basic causes – OHS

	2013	2014	2015	2016
Design	33%	37%	17%	28%
Preventive maintenance	20%	13%	17%	25%
Procedures	13%	13%	13%	22%
Management systems (people)	10%	10%	9%	9%
Equipment parts/defects	5%	4%	17%	6%
Management systems (equipment)	0%	2%	0%	3%
N/A or none	0%	2%	0%	3%
Tolerable failure	10%	6%	17%	0%
Work direction	0%	4%	4%	0%

Total OHS gas releases

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Australia - rate per 100 million BOE	4.14	7.18	10.06	7.86	7.47	8.77	6.79	4.93	5.97	7.01	3.90	N/A
IRF Countries - rate per 100 million BOE	3.94	4.61	4.49	3.18	4.21	4.17	4.05	3.51	3.89	5.90	7.50	N/A

Reportable environmental incidents

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Hydrocarbon vapour / petroleum fluid release								2	6	13	8	5
Chemical release								7	14	8	2	0
Fauna incident								4	5	1	1	2
Drilling fluid/ mud release								5	4	0	0	0
Other								0	2	0	2	1
Total								**18**	**31**	**22**	**13**	**8**

3.3 Fatalities and injuries

Total recordable cases

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Fatalities	0	0	0	1	0	0	0	2	0	0	0	0
Major injuries	8	5	7	12	12	9	8	5	2	2	5	0
Lost time injuries <3 days	9	13	3	6	5	3	6	3	0	2	2	2
Lost time injuries >= 3 days	17	26	21	29	31	32	20	16	13	5	7	4
Alternative duties injuries	14	21	58	53	28	47	37	43	28	26	30	24
Medical treatment injuries	79	58	61	89	39	61	47	36	26	20	44	22
Total	**127**	**123**	**150**	**190**	**115**	**152**	**118**	**105**	**69**	**55**	**88**	**52**

Injury rates by facility type

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
FPSO/FSOs	16.35	20.42	14.88	12.36	8.78	14.98	9.84	11.53	6.94	5.75	6.43	8.23
Platforms	12.66	9.16	13.07	10.80	7.21	9.82	5.58	6.23	5.47	5.46	7.13	5.96
Pipelines	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	32.73	0.00	0.00
MODUs	11.81	14.26	14.55	16.44	7.78	9.00	10.76	6.23	5.32	3.68	3.28	2.64
Vessels	13.43	5.24	9.37	18.79	7.84	13.44	8.30	5.07	2.34	2.32	6.28	5.18

Total recordable cases – nature of injury

	2013	2014	2015	2016
Wounds and amputations	31%	46%	37%	42%
Traumatic joint and muscle injuries	31%	21%	20%	27%
Musculoskeletal, systemic and infectious diseases	7%	10%	22%	13%
Fractures	12%	9%	9%	10%
Unspecified	18%	12%	7%	6%
Spinal, intracranial and nervous system injuries	0%	0%	5%	2%
Burns	1%	2%	0%	0%
Total	**100%**	**100%**	**100%**	**100%**

APPENDIX 5 – DATA TABLES (CONT'D)

3.3 Fatalities and injuries (cont'd)

Total recordable cases – location of injury

	2013	2014	2015	2016
Upper limbs	35%	47%	32%	44%
Lower limbs	28%	21%	20%	23%
Head and neck	21%	17%	28%	17%
Back (upper and lower)	7%	4%	13%	8%
Trunk	2%	9%	4%	8%
Systemic	1%	0%	2%	0%
Unspecifed	6%	2%	1%	0%
Total	**100%**	**100%**	**100%**	**100%**

Total recordable cases – mechanism of incident

	2013	2014	2015	2016
Hit by moving objects	38%	40%	27%	31%
Hitting objects	25%	17%	27%	27%
Body stressing	17%	17%	22%	21%
Chemicals and other substances	0%	0%	2%	8%
Falls, trips, slips	8%	9%	10%	6%
Heat, electricity, environmental	2%	4%	10%	4%
Unspecified (incl. other, multiple)	10%	13%	2%	4%
Total	**100%**	**100%**	**100%**	**100%**

Total recordable cases – agency of injury

	2013	2014	2015	2016
Non-powered equipment	44%	46%	50%	44%
Machinery/fixed plant	21%	23%	15%	31%
Chemicals and other substances	19%	9%	24%	13%
Powered equipment	3%	5%	8%	2%
Mobile plant/transport	0%	3%	2%	4%
Environmental and biological agencies	0%	3%	1%	2%
Unspecified	13%	11%	0%	4%
Total	**100%**	**100%**	**100%**	**100%**

Injury rates

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Fatality rate	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00
Major injury rate	0.82	0.50	0.62	0.92	0.81	0.67	0.57	0.32	0.15	0.13	0.32	0.00
LTI rate >= 3 days	1.75	2.60	1.87	2.23	2.10	2.39	1.41	1.02	0.97	0.34	0.45	0.52
LTI rate < 3 days	0.93	1.30	0.27	0.46	0.34	0.22	0.42	0.19	0.00	0.13	0.13	0.21
ADI rate	1.44	2.20	5.17	4.08	1.90	3.50	2.62	2.74	2.10	1.75	1.91	2.37
MTI rate	8.13	5.80	5.44	6.85	2.64	4.55	3.32	2.30	1.95	1.35	2.80	2.27

4 Complaints

Complaints

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
OHS complaints	29	35	22	25	12	15	23	5	6	3	3	1
EM complaints									4	2	2	1
Total	**29**	**35**	**22**	**25**	**12**	**15**	**23**	**5**	**10**	**5**	**5**	**2**

5 Inspections

Inspections

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
OHS	72	63	85	90	85	92	95	88	99	111	114	93
Well integrity							0	4	5	5	12	6
Environment								7	23	30	69	44

APPENDIX 5 – DATA TABLES (CONT'D)

7 Enforcements

Enforcements

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
OHS	30	27	37	66	56	25	97	60	36	25	34	3
Well integrity									1			
Environment								9	43	1	4	7
Total	**30**	**27**	**37**	**66**	**56**	**25**	**97**	**69**	**80**	**26**	**38**	**10**

Excludes verbal warnings/advice and investigation notices.

OHS enforcements by facility type

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
FPSOs	10	7	8	14	16	10	39	13	11	9	2	
MODUs	6	6	11	32	9	5	5	18	13	5	8	
Platforms	6	11	11	11	5	6	28	6	9	1	17	2
Pipelines							6	22				
Vessels	5		3	7	21	3	16	1	2	8	7	1
Other	3	3	4	2	5	1	3		1	2		
Total OHS	**30**	**27**	**37**	**66**	**56**	**25**	**97**	**60**	**36**	**25**	**34**	**3**

EM enforcements by petroleum activity type

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Construction									2			
Decommissioning									4			
Drilling								2	7			
Operations								2	26		3	4
Other								2	2			1
Seismic									1	1	1	2
Not specified								3	1			
Total EM								**9**	**43**	**1**	**4**	**7**

GLOSSARY – ACRONYMS AND COMMON TERMS

Term	Definition
AAUWA	Applications for approval to undertake well activity
Activity or petroleum activity	As defined in the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009
Actuator	A servomechanism that supplies and transmits a measured amount of energy for the operation of another mechanism or system
ALARP	As low as reasonably practicable. A principle that provides a means for assessing the tolerability of risk
AMOSC	Australian Maritime Oil Spill Centre
ARV	Air release valve
ATBA	Area to be avoided
Blowout	An uncontrolled release of hydrocarbons from a well
CHARM	Chemical hazard and risk management
CMMS	Computerised maintenance management system
Dangerous occurrence	See definition in clause 82 of Schedule 3 to the *Offshore Petroleum Greenhouse Gas Storage Act 2006*
DP	Dynamic positioning
DPO	Dynamic positioning operator
DPP	Diving project plan
Dutyholders	Parties with legislative responsibilities under the *Offshore Petroleum Greenhouse Gas Storage Act 2006*
EM	Environmental management
EP	Environment plan
ERP	Emergency response plan
HC	Hydrocarbon(s) – organic compounds of carbon and hydrogen
Improvement notice	Improvement notice A notice issued to the operator of a facility requiring action to prevent any further contravention or likely contravention of listed OHS law
KPI	Key performance indicator
LEL	Lower explosive limit
LTI	Lost time injury
MAE	Major accident event
Mechanism of incident or injury	A classification that captures the overall action, exposure or event that best describes the circumstances that resulted in the incident or injury
MoC	Management of change
Monkey board	The catwalk along the side of the derrick
MTI	Medical treatment injuries
N/A	Not applicable
NOPSA	NOPSA National Offshore Petroleum Safety Authority (NOPSEMA superseded NOPSA on 1 January 2012)
NOPSEMA	NOPSEMA National Offshore Petroleum Safety and Environmental Management Authority
NOPTA	NOPTA National Offshore Petroleum Titles Administrator
NT	Northern Territory

Acronyms and common terms (cont'd)

Term	Definition
OCNS	Offshore chemical notification scheme
OHS	Occupational health and safety
OSRL	Oil Spill Response Limited
OSRO	Oil spill response organisation
Operator	Operator In relation to a facility or proposed facility, the person who, under the Regulations, is registered by NOPSEMA as the operator of that facility or proposed facility (as defined in Clause 5 of Schedule 3 of the OPGGS Act)
OPGGS Act	Offshore Petroleum and Greenhouse Gas Storage Act 2006
Personal safety	A category of risk management focusing on injuries such as slips, trips, falls, 'struck-by' incidents and strains; Personal safety programs place an emphasis on personal behaviour and the wearing of personal protective equipment
Performance standard	Are the parameters against which control measures for MAEs are assessed to ensure they reduce the risks to ALARP on an on-going basis
Pipeline	Pipeline See "Facility"
Process safety	A category of risk management focusing on the prevention of uncontrolled releases of hydrocarbons, chemicals, energy, or other potentially dangerous materials (including steam) during the course of facility processes and which can cause major accident events; Process safety involves, for example, the prevention of leaks, spills, equipment malfunction, overpressures, over-temperatures, corrosion, metal fatigue and other similar conditions; process safety programs focus on design of facilities, maintenance of equipment, alarms, effective control points, procedures and training
PRS	Position reference system
Prohibition notice	A notice issued to the operator of a facility in order to remove an immediate threat to the health or safety of any person
PSMP	Pipeline safety management plan - A plan for managing OHS risks to personnel at or near pipeline facilities
PSZ	Petroleum safety zone
QA	Quality assurance
QC	Quality check
Risk assessment	The purpose of a risk assessment is to provide the operator of a facility with a detailed understanding of all aspects of the risks to people that may arise at or near the facility
ROV	*Remotely operated vehicle*
SC	Safety case- A document prepared and submitted by an operator of a facility to NOPSEMA that identifies the hazards and risks at the facility, describes how the risks are controlled and the health and safety management systems which are in place to ensure that the controls are effectively and consistently applied
SCAP	Safety case administration procedure
SCE	Safety critical equipment
SMP	Safety management pla
SMS	Safety management system
SSSV	Subsurface safety valve
TapRoot®	A classification system for root cause analysis

Acronyms and common terms (cont'd)

Term	Definition
Titleholder	The permittee of a petroleum exploration permit, the lessee of a petroleum retention lease, or the licensee of a petroleum production licence (as defined in subsection 51 and 572(1) of the *Offshore Petroleum Greenhouse Gas Storage Act 2006*
TOOCS	Type of occurrence classification system
TRC	Total recordable cases
Wellhead	A general term used to describe the component at the surface of an oil or gas well that provides the structural and pressure-containing interface for the drilling and production equipment
WI	Well integrity
WOMP	Well operations management plan - A document that the titleholder must submit which should specify acceptable methods of conducting well operations in accordance with sound engineering principles and good oilfield practice

The following categories of facilities are recognised within the legislation:	
Facility	A vessel, structure or pipeline at which offshore petroleum operations are being performed – defined in Clause 4 of Schedule 3 to the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*
Accommodation, construction and pipelay vessel	A maritime vessel used in the construction of subsea infrastructure
Floating production, storage and offloading vessel (FPSO)	Similar in appearance to an oil tanker and carries production and processing facilities, with the addition of storage tanks for the crude oil recovered from the wells
Floating storage and offloading vessel (FSO)	Similar to an FPSO with reduced production and processing facilities
Large production platform	A large scale production facility, which can be a floating or fixed marine vessel (conducting specific activities at a location)
Mobile offshore drilling unit (MODU)	An offshore facility (capable of independent navigation) used for drilling or servicing a well for petroleum
Pipeline	A pipe or system of pipes in an offshore area used for conveying petroleum (whether or not the petroleum is recovered from an offshore area)
Production platform (with drilling or no drilling, can be attended (manned) or not normally attended (unmanned))	A platform from which development wells are drilled that also houses processing plant and other equipment

REFERENCES

Borthwick, David AO PSM 2010, *Report of the Montara Commission of Inquiry*, Commonwealth of Australia, Canberra

Department of Resources, Energy and Tourism 2011, *Final Government Response to the Montara Commission of Inquiry*, Commonwealth of Australia, Canberra

Department of Primary Industry and Energy 1995, *Procedures and Records for Administration of Safety for Offshore Petroleum Facilities, Offshore Petroleum and Greenhouse Gas Storage Act 2006*, Safety Case Administration Procedure National Accident/Incident Database (SCAP 905)

National Offshore Petroleum Safety and Environmental Management Authority 2014, *Offshore Health and Safety Performance Report*, NOPSEMA, Perth

National Offshore Petroleum Safety and Environmental Management Authority 2013, *Offshore Health and Safety Performance Report*, NOPSEMA, Perth

National Offshore Petroleum Safety and Environmental Management Authority 2012, *Offshore Health and Safety Performance Report*, NOPSEMA, Perth

National Offshore Petroleum Safety Authority 2010, *Offshore Health and Safety Performance Report*, NOPSA, Perth

Standards Australia 1990, Workplace Injury and disease recoding standard, Australian Standard AS1885-1. 1-1990

Legislation

Offshore Petroleum and Greenhouse Gas Storage Act 2006 (Cth.) (No 14) 2006 as amended

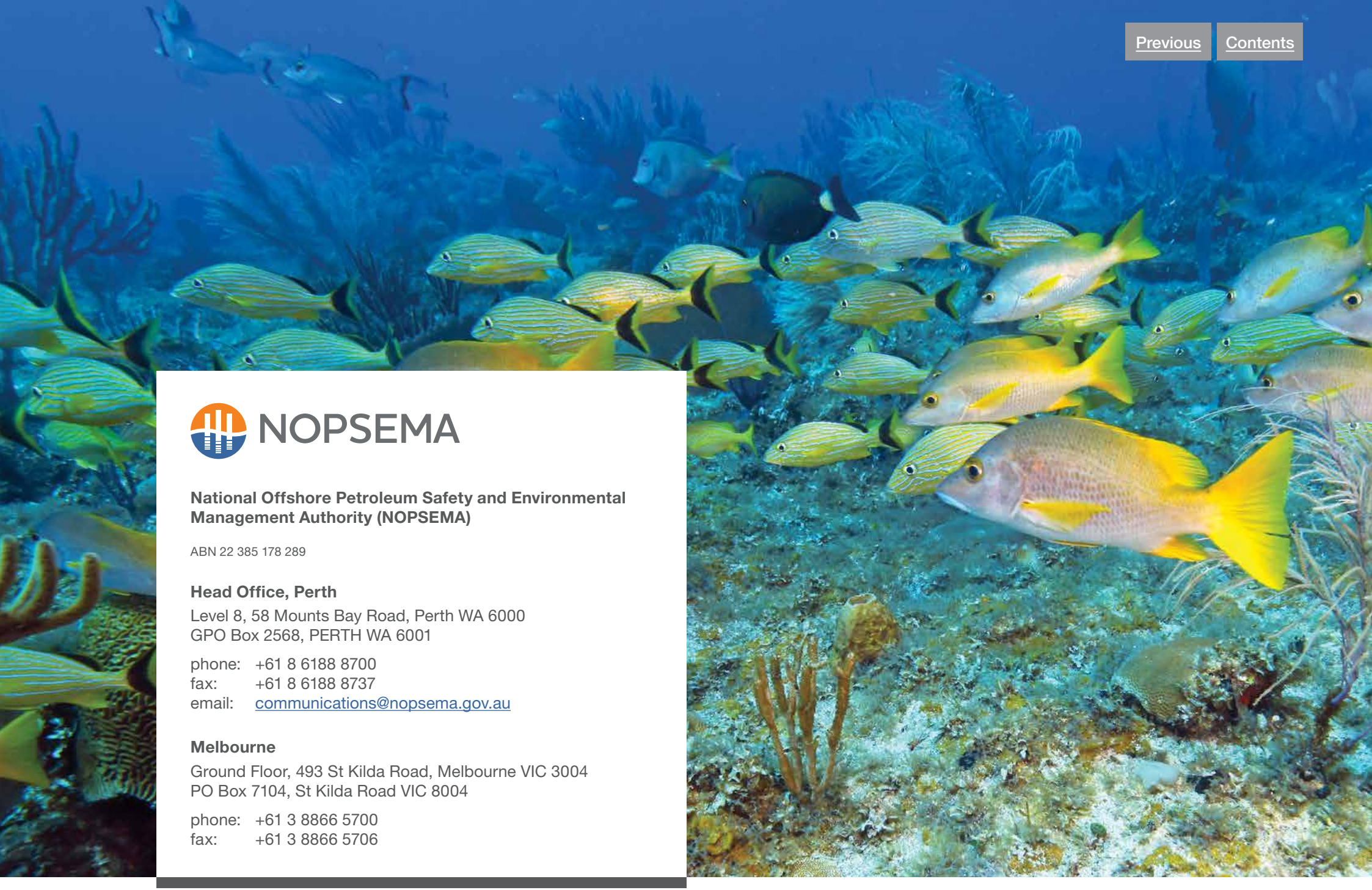
Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (Cth.) Statutory Rules 1999 (No. 228) as amended and made under the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*

Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009 (Cth.) Select Legislative Instrument 2009 (No. 382) as amended and made under the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*

Offshore Petroleum and Greenhouse Gas Storage (Resource Management and Administration) Regulations 2011

Regulatory Levies Act 2003. *Offshore Petroleum and Greenhouse Gas Storage (Regulatory Levies) Act 2003* (Cth.) (No. 117) of 2003 as amended

Regulatory Levies Regulations 2004. Offshore Petroleum and Greenhouse Gas Storage (Regulatory Levies) Regulations 2004 (Cth.) Statutory Rules 2004 (No. 315) made under the *Offshore Petroleum (Regulatory Levies) Act 2003*



NOPSEMA

National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA)

ABN 22 385 178 289

Head Office, Perth

Level 8, 58 Mounts Bay Road, Perth WA 6000
GPO Box 2568, PERTH WA 6001

phone: +61 8 6188 8700
fax: +61 8 6188 8737
email: communications@nopsema.gov.au

Melbourne

Ground Floor, 493 St Kilda Road, Melbourne VIC 3004
PO Box 7104, St Kilda Road VIC 8004

phone: +61 3 8866 5700
fax: +61 3 8866 5706