

the REGULATOR

National Offshore Petroleum Safety and Environmental Management Authority



NOPSEMA

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About NOPSEMA

The National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) is Australia's independent expert regulator for health and safety, structural and well integrity, and environmental management for offshore petroleum facilities and activities in Commonwealth waters.

By law, offshore petroleum activities cannot commence before NOPSEMA has assessed and accepted detailed risk management plans documenting and demonstrating how an organisation will manage the risks to health and safety to as low as reasonably practicable (ALARP) and the risk to the environment to ALARP and with acceptable environmental impacts.

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In this issue

Message from the Chief Executive	4
<i>The Regulator</i> evolving: focus areas and the pathways to improvement	6
How ‘safe’ organisations can drift into disaster	7
Continuous improvement in vessel safety cases	8
Good industry practice in the construction of HPHT wells	9
Verifying safety features of light well intervention systems during commissioning	11
DP systems’ tolerance to human error: an international collaboration	12
Work management review following recent incidents	14
Whole body vibration hazards	16
NOPSEMA concerned about misuse of ‘management of change’	17
Improving access to environmental management information	19
Preparing your EP five-year revision?	21
NOPSEMA participates in Australia’s largest oil spill response exercise	22
New guidance on transfer of operational control	23
NOPSEMA participates in international diving seminar	24
IRF maintains focus on industry performance	25
Quarterly performance dataset – Q3:2017	27
Schedule of events	32



Message from the Chief Executive

Looking back on the year, I am reluctant to characterise it simply as one of success or struggle. We began the year concerned industry's occupational health and safety performance would drop. We were particularly concerned that in response to the consistently low oil and gas price, companies would follow the well-trodden path to cost-cutting; which anecdotal evidence suggests results in higher risk profiles and declining performance.

In the first half of the year, this concern seemed to be confirmed with the number of uncontrolled hydrocarbon gas releases reported to NOPSEMA noticeably increasing compared to the year before. The majority of these releases came from a single titleholder and, to prevent future occurrences, NOPSEMA determined it was appropriate for the regulator to step in. In the months following our intervention, the titleholder's performance markedly improved and the number of reported gas releases stabilised. When we look at serious injury data, in the first half of the year the industry achieved a record 15 consecutive months without a single serious injury. This is an achievement to be proud of, however, in the last few months there has been four serious injuries reported to NOPSEMA. Such a sudden and dramatic increase is a concern and these incidents are now the subject of close investigation by NOPSEMA. Currently, NOPSEMA is undertaking a comprehensive review and analysis of industry performance data for 2016, the findings of which will be published in the *Annual offshore performance report* early next year.

This year, NOPSEMA issued four safety alerts, which is the highest number of alerts we have issued in three years. The most recent alert sought to draw industry's attention to the importance of adequate testing in commissioning following two dropped objects during light well intervention activities. While this incident did not result in a death or serious injury, a worker could have been killed if one of these objects had hit them. Currently, there is an unprecedented level of commissioning activity in Australia and this is stretching the capability of the industry. The price of safety is eternal vigilance. It is imperative for operators to ensure quality control inspections

are undertaken during the installation and commissioning of equipment and that they are sufficient to verify that equipment and components meet approved specifications. It is also important to engage the operations workforce as early as possible to enhance facility and system familiarisation and awareness.

Ensuring that internal systems and procedures are fit-for-purpose is an expectation that also applies to the regulator. Recently, NOPSEMA participated in Australia's largest exercise to test control and coordination arrangements for a significant offshore oil spill. The exercise was hosted by the Western Australian Department of Transport with a large number of Western Australian and Commonwealth government agencies, and Quadrant Energy Limited volunteering to play the role of the operator. The exercise provided NOPSEMA with a unique and valuable opportunity to test our regulation of a titleholder's response to a significant offshore oil spill. Over the coming months we will be addressing areas for improvement identified during the exercise.

It is important to recognise that NOPSEMA's independence does not preclude dialogue with all of our stakeholders. Effective regulation, in fact, depends on meaningful communication and engagement. This year, NOPSEMA conducted 684 meetings with duty holders, government, non-government and industry stakeholders including unions, environment non-government organisations, and fishing groups. Through these meetings, and other engagement opportunities, we have sought to understand and address varying stakeholder perspectives. For example, we acted on the industry's request for a reduction in unnecessary regulatory burden through our endorsement and advocacy of the Reference Case Project. This project has the potential to reduce both the size and complexity of environment plans. I would like to welcome National Energy Resources Australia (NERA) as the interim coordinator of the project. As the project coordinator, NERA will be working closely with industry and other stakeholders to determine a sustainable model for the ongoing review, maintenance and development of reference cases.

NOPSEMA also welcomes the recent announcement by the Minister for Resources and Northern Australia regarding a series of changes to the offshore petroleum regulatory regime. The changes seek to implement the recommendations of the Offshore Petroleum Consultation and Transparency Review and include, but are not limited to, publishing environment plans that propose exploration activities for a period of public comment. NOPSEMA will continue to work with the Australian Government and industry partners to

support these changes to the regime. NOPSEMA will also continue to progress its own initiatives to improve transparency, such as establishing a new Community & Environment Reference Group (CERG). Expressions of interest are now open for potential members of the CERG who can provide NOPSEMA with a range of different perspectives on offshore petroleum environmental management and the administration of the Environments Regulations.

While our views and expectations may vary, protecting the health and safety of the offshore workforce and reducing environmental risks and impacts must remain our common goal. There will be many opportunities in the coming year to exchange perspectives and assess performance and NOPSEMA looks forward to continuing this constructive exchange. I wish all the readers of *The Regulator* a Merry Christmas and happy and safe New Year.



Stuart Smith, CEO

The Regulator evolving: focus areas and the pathways to improvement

Offshore petroleum exploration and production are inherently high-risk activities that must be appropriately managed to protect the health and safety of people while reducing environmental risks and impacts.

Understanding the potential catastrophic consequences of a major incident, NOPSEMA has identified four focus areas to guide its regulatory, promotion and advice activities:

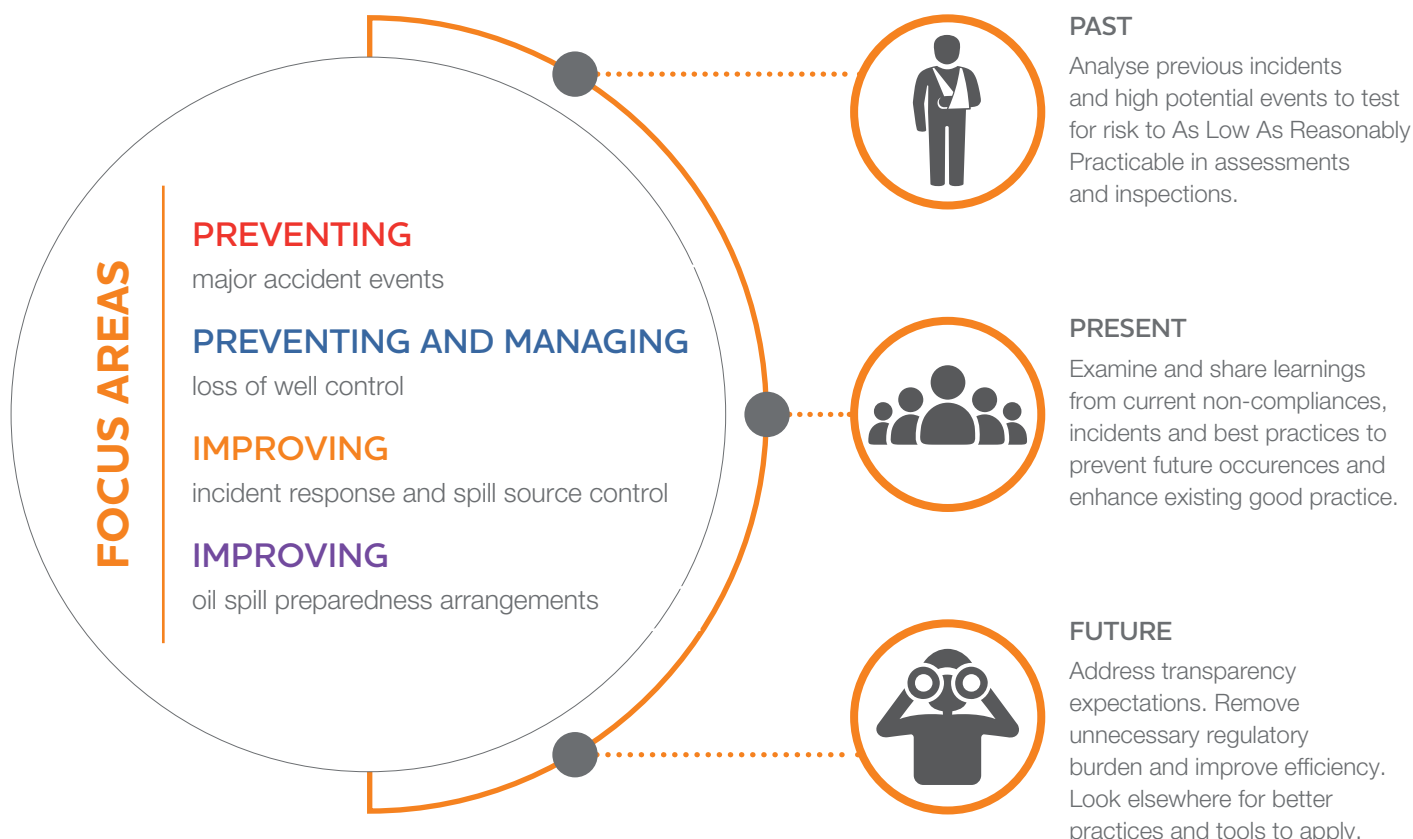
- preventing major accident events (loss of life, loss of containment)
- preventing and managing loss of well control
- improving incident response and spill source control
- improving oil spill preparedness arrangements.

NOPSEMA has selected these focus areas in accordance with its *Compliance strategy* to facilitate improvements in industry performance across health, safety, well integrity and environmental management.

As outlined in the 'Pathways to improvement' article in the last issue of *The Regulator* (Issue 3: 2017), NOPSEMA will explore the focus areas through three lenses: past (preventing old accidents), present (find one, fix many) and future (emerging trends).

This edition of *The Regulator* reflects the latest trends, insights and initiatives of the focus areas. This and future editions will continue to provide articles on other matters to highlight lessons learnt, examples of best practice, emerging issues and upcoming events. If you have suggestions or feedback on *The Regulator*, please email communications@nopsema.gov.au.

PATHWAYS TO IMPROVEMENT



How ‘safe’ organisations can drift into disaster

Investigations into major accident events in high-risk industries often identify patterns of gradual and unrecognised increases in risk. This change in risk often follows a lengthy period of safe operations. The following article has been prepared to consider the concepts of ‘disaster incubation’ and ‘drift’ and the steps the offshore petroleum industry can take to ensure risks remain as low as reasonably practicable (ALARP).

How do disasters happen in ‘safe’ organisations?

Offshore petroleum organisations operate in a highly competitive, commercial environment with limited resources. Within this environment, economic, workload and safety constraints create boundaries to productivity. Pressures to improve productivity create pressure on workload and safety constraints, resulting in incompatible goals (e.g. faster, cheaper, better at the expense of safety). For operations to proceed, individuals at all levels of the organisation engage in a constant, often subconscious, process of goal negotiation and trade-off between economic, workload and safety goals. Examples of this include:

- reducing workforce numbers (due to cost-reduction or competition for talent) without reducing the volume of work accordingly
- deferring planned or routine inspection and maintenance activities to allow for prioritisation of production-related activities
- removing implemented control measures for the purposes of saving money using a reverse-ALARP argument.

These types of decisions are generally perceived as unremarkable due to a shared belief in the infallibility of control measures, leading to complacency. This belief allows such decisions to be made in favour of economic goals without any consideration of the potential encroachment into safety boundaries. The consequent accumulation of many small concessions for economic goals gradually increases the overall potential for a major accident event because safety controls have been eroded.

How can organisations identify ‘drift’ and intervene before disaster?

Vigilance and monitoring of ‘weak signals’ is critical to continued safe operations. Weak signals are small anomalies that appear innocuous and are easily dismissed but may be indicative of impending larger problems,



only becoming significant in hindsight. Weak signals are reflected in cultural trends symptomatic of drift; these include 'decrementalism' and 'normalisation of deviance'.

Decrementalism refers to incremental steps away from an established safe standard. When a slight departure from an established safe standard is 'successful' (i.e. an economic goal is met without an obvious impact on safety), a new norm is created. This new norm is then used as the basis from which to depart slightly again. The incremental nature of the departures makes them unremarkable and unreportable, but over time, the distance between the original established safe standard and the current 'safe' norm increases, and safety margins are eroded. Examples of decrementalism include:

- increasing the interval for a planned inspection or test without evidence that it is safe to do so, for example without inspection data, engineering assessments or alternative forms of inspection
- removing or softening established limits, specifications or standards requirements from procedures and instructions
- deviating from established performance standards without evidence to demonstrate that risk remains ALARP.

Normalisation of deviance occurs when signs of potential danger are acknowledged but then rationalised and normalised, allowing continued operation under conditions that have been reclassified as 'safe' (i.e. it was fine last time so it will be fine this time). This process is repeated in the face of increasing signs of danger, resulting in incremental steps towards greater risk. Examples of normalisation of deviance include:

- long-term holds or overrides on 'nuisance' alarms without investigation, corrective action or risk assessment
- continued operation despite documented actual performance not conforming with defined parameters
- failure to act on classification and verification report recommendations
- inspection and maintenance records signed off as complete, despite steps being skipped or maintenance issues noted (e.g. corrosion) with no corrective action raised.

NOPSEMA strongly encourages all duty holders to identify and monitor weak signals via thorough auditing processes, rigorous decision-making protocols, and personnel taking a 'devil's advocate' role in group discussions. NOPSEMA will also continue to monitor duty holders' responses to weak signals through regular inspections. If necessary, we will take actions to ensure that any concerning trends are appropriately addressed and that risk remains ALARP.

Continuous improvement in vessel safety cases

NOPSEMA has identified a notable increase in the quality of safety cases submitted by operators for vessels working in hydrocarbon environments.

This improvement may be influenced by the NOPSEMA guidance note on vessel facilities subject to external hydrocarbon hazards (GN1733). This guidance note was published to assist operators in developing safety cases that meet regulatory requirements.

NOPSEMA developed this guidance in response to regular deficiencies identified in vessel safety cases relating to hydrocarbon hazards, and the large proportion of safety case rejections and resubmissions. The new guidance supplements the existing safety case content and level of detail guidance note (GN0106).

Since the guidance note became available, initially as a draft for comment in early 2017, there has been a 5.5% decrease in safety case rejections (from 33.5% in 2016 to 28% in 2017) and a 22% decrease in the number of safety case resubmissions (from 50% in 2016 to 28% in 2017).

To access the guidance note and other safety case guidance material see www.nopsema.gov.au/safety/safety-case/safety-case-guidance-notes/.

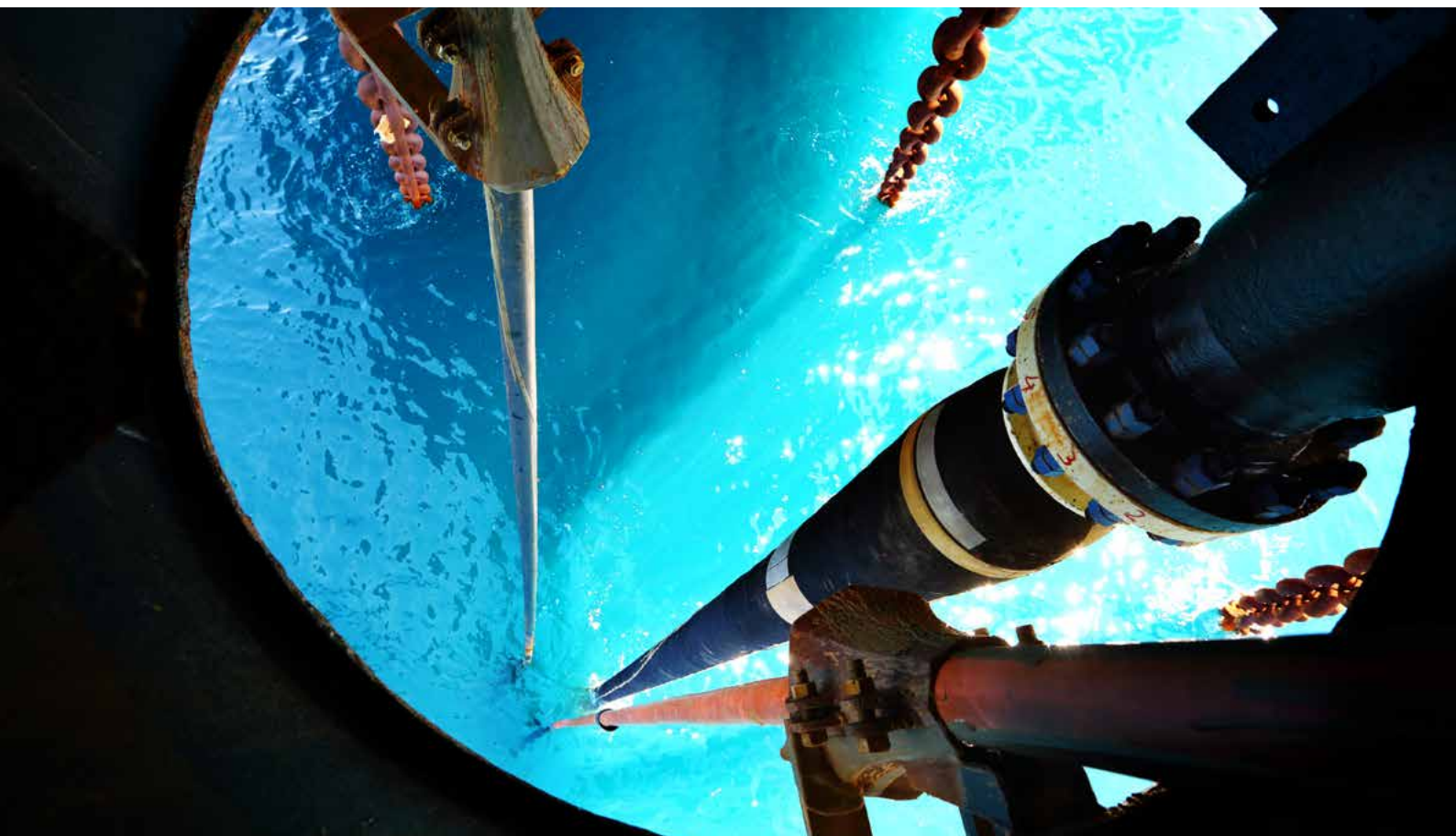
Good industry practice in the construction of HPHT wells

A high pressure, high temperature (HPHT) well has a bottom-hole temperature of at least 300 degrees Fahrenheit (149 degrees Celsius) and pore pressure higher than 10,000 pounds per square inch (69 MPa). These extreme conditions make the well construction process challenging, including maintaining well control and durability of drilling equipment. Drilling practices and technologies used in their construction require greater oversight.

For example, it is good industry practice to have a HPHT specialist on-site during drilling operations to provide oversight and expert advice (as described in the accepted industry standard *Model code of safe practice*, Part 17, Volume 1, 2 and 3, published by the Energy Institute). During a recent assessment of a well operations management plan (WOMP) and safety case, NOPSEMA noted that neither the titleholder nor the facility operator had committed to having a HPHT specialist on-site. NOPSEMA inspectors requested that both parties review this commitment and they agreed. The updated WOMP and safety case were accepted.

During the HPHT drilling operations, NOPSEMA's well integrity and OHS inspectors undertook a planned inspection at the facility. They reviewed the use of the HPHT specialist, and found significant value in the addition of this role; the workforce had more confidence in conducting safe operations and had better training and well control drills.

NOPSEMA reminds titleholders and facility operators of their responsibility to take all reasonably practicable steps to manage and reduce the health and safety risks of a facility, its activities and the risks to the integrity of the well to a level that is ALARP. Through its regulatory activities, NOPSEMA will continue to advise industry on good practice and promote the adoption of these practices.





SWL 2.5

SWL 17.0

SWL 2.5

SWL 2.5

SWL 20

Verifying safety features of light well intervention systems during commissioning

Recently, an operator's failure to fully understand light well intervention system functionality caused two dropped objects; one of which could have resulted in a fatality if it had struck a person.

As light well intervention vessels are relatively new to the Australian offshore petroleum regime, this incident has presented NOPSEMA with an opportunity to highlight lessons learnt. This will help prevent similar events from occurring and becoming a future trend for these vessels.

The incident occurred when a light well intervention vessel was recovering equipment from a water depth of 200 metres using a winch and guide wire. A fault occurred in the winch, resulting in the activation of the winch brakes and deactivation of the active heave compensation. Although an alarm was activated, it remained undetected for approximately 30 minutes. The heave and movement of the vessel during this time caused the guide wire to part subsea. When the console operator detected the fault, believing the guide wire was still attached subsea, they retested the system. The retesting increased the tension on the guide wire. Eventually, the associated service hose stretched and the clamps lost friction with the guide wire, causing the rapid retraction of the wire. This led to two clamps striking the sheave at the top of the tower, one of which fell to the deck below.

NOPSEMA's investigation into this incident identified several contributing issues, including:

- several inconsistent, incorrect or outdated safety manuals for the safety-critical equipment
- inadequate commissioning of the safety systems for the equipment
- failure to identify and assess the clamps as a dropped object risk
- lack of a formalised alarm management process for the system.

NOPSEMA has identified numerous lessons, including:

- Commissioning of safety-critical systems should include verification of all safety features.
- A robust document control system is necessary for safety-critical operating manuals and a robust quality control process should be in place for developing or modifying safety-critical manuals.
- A formalised alarm management process should be in place for safety control systems.
- An effective operator-machine interface should be incorporated into the design to allow operators to respond to alarms in a timely and appropriate way.
- Toolbox talks should clearly describe the individual tasks for the activity and identify the risks and controls specific to each task.

NOPSEMA reminds facility operators that it is critical to have in-depth knowledge and understanding of the functionality and safety features of complex equipment. Facility operators also need to know how that equipment will behave in abnormal conditions, as a failure to verify and fully understand how safety-critical systems operate can lead to unexpected consequences.

For further information see *Safety alert 67* at www.nopsema.gov.au/safety/safety-alerts.

DP systems' tolerance to human error: an international collaboration

Since 2016, NOPSEMA has raised concerns about dynamic positioning (DP) systems with the offshore petroleum industry. Our concern is that DP systems' auto-position modes are susceptible to inadvertent deactivation. This concern originated from a loss-of-position incident in June 2016. It is not an isolated event; NOPSEMA is now aware of 16 similar incidents internationally. All of these had the potential to result in a major accident event.

Examples of loss-of-position incidents

In the Australian incident, the operator of a vessel's DP system placed a notepad on the console which pressed down on the 'surge' button twice, unintentionally deactivating the auto-position mode. With the crew unaware, the vessel drifted off-location while a diver was working on the seabed. The diver alerted vessel personnel, as he followed his umbilical and walked with the drifting vessel, avoiding obstacles along the way. Fortunately, the diver was unharmed, but if the umbilical had snagged on subsea infrastructure, the diver could have died. A subsequent inspection by NOPSEMA determined that the incident was the result of human error made possible by a weakness in the design of the DP system (see *Safety alert 62*, available at www.nopsema.gov.au/safety/safety-alerts).

In the United States, a drill ship in the Gulf of Mexico unintentionally drifted off position while dealing with a well kick. The US Coast Guard Outer Continental Shelf National Centre of Expertise (OCSNCE) stated that the DP operator inadvertently deactivated the auto-position mode by accidentally double-pressing the manual button while reaching across the console. Upon realising the mistake, the operator re-engaged the auto-positioning to bring the ship back into position. The US Coast Guard OCSNCE stated the incident was the result of 'human error with a mix of ergonomics'.

In the United Kingdom, a semi-submersible drilling rig lost control of its position for several minutes due to an accidental disengagement of the DP system while drilling. Although the loss of position was immediately noticed by personnel, it took them six minutes to realise that the auto-positioning system had been disengaged. In response to the emergency, the drill pipe was sheared and the lower marine riser package was disconnected. The UK Health and Safety Executive attributed both the loss of position and inadequate crew response to the 'poor ergonomic design of the control system'.

If further control measures had failed in either the United States or United Kingdom incidents, a well blowout could have occurred, potentially resulting in multiple fatalities and a significant environmental incident.

What the industry should consider

Centralised control systems need to be resilient against human error. A single, inadvertent act by an operator should not lead to an emergency with a high probability of fatalities. Control systems should also provide adequate feedback to operators to allow them to promptly identify the issue and take appropriate action.

Facility operators are reminded to check their systems to ensure they are not susceptible to this type of design-induced human error. They should also ensure that suitable controls are in place to prevent, identify and adequately recover from the error. Operators should talk to DP manufacturers about having more robust controls in the design of their DP systems. For example, tactile differentiation (error prevention) of safety-critical switches, action confirmation dialogue boxes, provision of a high-visibility display (error identification and recovery) and audible alarms or warnings. Other industries, such as aviation, may have systems that could provide solutions (e.g. aircraft auto-pilot controls).

DP manufacturers are encouraged to review the built-in safeguards of their systems to ensure they provide sufficient protection, feedback and recovery against this type of design-induced operator error, noting that the three incidents above all had a double-press requirement for deactivating the auto-position mode.



What is the IRF doing?

In October 2017, at the International Regulators Forum (IRF) AGM in Denmark, NOPSEMA presented the latest information on the risks posed by design-induced human error in DP systems.

The presentation, relying on publicly available information, showed that the frequency of unintended and undetected DP system deactivation is significantly greater when viewed from an international perspective. The risk of death or other major accident event is also greater. NOPSEMA's presentation showed that measures to reduce risks are available, but these are not necessarily widely known or adopted. As a result, these risks are not being reduced to ALARP.

At the AGM, the IRF endorsed the need to maintain focus on this issue and to share information about risk areas. NOPSEMA agreed to write to DP system suppliers and industry bodies to inform them of the outcomes of the AGM and IRF member countries agreed to take action appropriate to their regulatory regimes.

NOPSEMA has also delivered the presentation at industry conferences in Asia and the United States, and written to DP system suppliers to make them aware of this work. We have requested their responses as to how they are addressing this issue.

Work management review following recent incidents

During the last 90 days, NOPSEMA has received multiple notifications of dangerous occurrences which have resulted in serious injuries and other incidents which could have resulted in death or serious injury. NOPSEMA has identified similarities between a number of these incidents, related to work management.

Work planning

During the planning phase of work, operators need to give consideration to the task that is to be performed, including:

- whether or not the task is standard or routine and has been performed before
- whether there are differences or new requirements that need to be accommodated.

For example, there were two incidents where the work environment and ergonomics of the task, or the task itself, were either new or somewhat different to those previously experienced, or anticipated in pre-developed and generic work procedures/instructions and their associated job safety analysis/job hazard analysis.

Before commencing work, operators must undertake a detailed review of the actual task to be performed and the operational conditions that will be present when the task will be performed.

Development and review of work procedures/instructions

Offshore petroleum organisations invest a lot of resources in developing work procedures/instructions for personnel to use. However, they are generally developed in advance and are generic in nature. Therefore, work procedures/instructions may not be aligned to the actual task and the operational conditions at the time of use.

NOPSEMA reminds facility personnel to undertake a detailed review of work procedures/instructions as part of their work planning. This will ensure that procedures/instructions are specific to the task.

In one incident, NOPSEMA found no clear work instruction or procedure for the task being undertaken. In another incident, personnel failed to follow the work procedure.

While considerable effort is normally taken in the development of work instructions and procedures, it is incumbent on personnel to then adhere to them in order to work safely.

Development and review of job safety analysis/job hazard analysis

Offshore petroleum organisations often develop a job safety analysis/job hazard analysis (JSA/JHA) well in advance of work. These generic JSA/JHAs can only attempt to anticipate hazards and their control measures.

As such, a detailed review of the JSA/JHA should be undertaken as part of work planning, before commencing work. Specific tasks to be performed and changes in operational conditions need to be captured. A review of the JSA/JHA during a toolbox talk should also be undertaken where work has recommenced after a delay or period of inactivity.

In one recent incident, a task-specific JSA/JHA had not been developed. In another, the personnel failed to adhere to the precautions identified in the JSA/JHA.

NOPSEMA reminds facility personnel to adhere to JSA/JHAs in order to undertake work safely.

Initiation and approval of permit to work

In two recent incidents, the permit initiator did not include adequate details about relevant controls for work activities in the permit. Furthermore, permit approvers and issuers did not carry out a detailed review of the permit prior to approval and issue.

In another incident, no permit was raised for electrical work undertaken. The responsible person was reported to be unfamiliar with the permit to work system.

Facility operators are reminded that personnel involved in the initiation, approval and use of a permit should ensure that adequate details of the work activities and relevant controls are documented in the permit. Further, facility management should ensure compliance with the permit to work system.

Electrical isolations

In two incidents, NOPSEMA identified that personnel failed to positively confirm electrical isolations prior to commencing work. In three incidents, personnel failed to test that electrical cables were 'de-energised' and safe prior to commencing their work.

NOPSEMA requests that facility operators:

- ensure that electrical isolation procedures clearly identify the preferred method of electrical isolation
- confirm that the electrical isolation is effective
- confirm that the circuit is de-energised, safe and, where appropriate, arrange independent verification of electrical isolations.

As a result of these incidents, NOPSEMA issued *Safety alert 66* about the potential for fatalities from electrical incidents. A copy is available at www.nopsema.gov.au/safety/safety-alerts.

Work supervision

In two incidents, NOPSEMA identified that supervision of work was inadequate. In another incident, we identified a lack of supervision in the verification of electrical isolations. NOPSEMA reminds facility operators to provide adequate work supervision to ensure that work is performed safely.





Whole body vibration hazards

Four years ago, NOPSEMA published an article in Issue 1 of *The Regulator* on hand–arm vibration. That article highlighted the potential health effects of hand–arm vibration hazards to offshore workers who operate handheld power tools and equipment such as angle grinders, needle guns, drills and impact wrenches. A similar but perhaps less well known hazard is whole body vibration (WBV).

Workers are at risk of injury from WBV if appropriate measures are not applied to manage the impacts of vibrating mechanical equipment. Further, working for prolonged periods on structures attached to vibrating mechanical equipment may pose serious health effects that could lead to permanent, progressive and/or irreversible musculoskeletal disorders.

Where personnel are required to work on vibrating equipment for extended periods, facility operators should ensure a WBV or health risk assessment has been undertaken to determine the risks. There are various control measures that can be put in place to eliminate or reduce risks associated with WBV hazards to ALARP. These controls may be engineered or administrative, such as:

- substituting hazardous equipment with safer options, for example purchasing equipment with lower vibration emissions
- isolating the hazard from workers, such as isolating or dampening a work platform to eliminate or minimise mechanical equipment vibration using rubber mounts
- limiting the amount of time workers are exposed to WBV.

Operators are reminded to take all reasonably practicable steps to ensure that all work is carried out in a manner that is safe and without risk to the health of any person at or near the facility. Safe Work Australia has published information about the risks posed by WBV and control measures, available at www.safeworkaustralia.com.au.

NOPSEMA concerned about misuse of ‘management of change’

Recently, NOPSEMA has noticed an increase in dutyholders using Management of change (MoC) to facilitate organisational change. This includes changes in safety and environmental management systems and changes in safety- and environmental-critical equipment which is used to reduce risks to health and safety, well integrity and manage impacts and risks to the environment.

NOPSEMA notes some positive aspects to this growing application in areas such as management systems and organisational change (in addition to the traditional application of MoC to temporary changes to technical or hardware controls). However, we are concerned about the emerging trend of misusing MoC to facilitate permanent deviations from commitments made in permissioning documents (such as safety cases, well operations management plans and environment plans).

The following are examples of situations where MoC has been used to justify continued operations:

- A safety-critical valve, described as a control measure within the facility’s safety case, no longer met its performance standard, either through degradation or damage, and the facility operator did not intend to repair or replace it.
- A titleholder changed its arrangements for oil spill response, meaning that its preparedness arrangements (detailed in the environment plan) are no longer in place or are of a lesser standard.
- A titleholder conducted a longer seismic survey than described in their accepted environment plan, without considering the impact on marine turtles. The survey extended into a biologically important area during the peak nesting period for several marine turtle species.

NOPSEMA recognises that duty holders may use MoC to facilitate a change in the way they manage risk. This is appropriate when the change is temporary and short-term, and when equivalent or better controls and/or alternative ways of working (e.g. restrictions on certain activities) are put in place in the interim. However, MoC is not a substitute for formal revision and acceptance of a permissioning document, particularly where it is being used to facilitate long-term or permanent change.

NOPSEMA has also seen cases of duty holders using MoC to justify a reverse-ALARP situation. That is, where an existing control measure, which was once considered reasonably practicable, is removed or no longer fully functional and the duty holder does not intend to repair or replace it. This decision is quite often made due to rising costs, with MoC being used to justify the resulting higher level of risk. Section 3 of NOPSEMA’s ALARP guidance note (www.nopsema.gov.au/assets/Guidance-notes/A138249.pdf) outlines the principles that underpin ALARP and discusses the reverse-ALARP concept.

When using MoC, duty holders need to ensure that any proposed change reduces risks to ALARP and environmental impacts to an acceptable level. Duty holders should also consider if the change will impact on any other regulatory requirements. For example, a proposed change could alter the basis on which a permissioning document was accepted. This triggers the duty holder’s obligation to submit a revised permissioning document to NOPSEMA for assessment and acceptance.

For more information on changes that are likely to require a revised environment plan, see NOPSEMA’s guideline on *When to submit a proposed revision of an environment plan* (www.nopsema.gov.au/assets/Guidelines/A515816.pdf).

Expressions of interest: Community and environment reference group

NOPSEMA is pleased to invite expressions of interest for our newly established Community and environment reference group. This group is being established to work with community stakeholders to gain a better understanding of the varying perspectives on offshore petroleum environmental management, and our administration of the Environment Regulations.

NOPSEMA is seeking expressions of interest from potential members who can bring a range of different perspectives broadly reflective of the community, including: commercial and recreational fishing, conservation advocacy, public policy and government functioning, small business and tourism, cultural heritage and Indigenous communities; as well as regional perspectives from the north-west, south-east and northern regions of Australia. Members will participate as individuals and they may bring more than one perspective but they will not participate as an affiliate or representative of any particular organisation or group.

Proposed terms of reference, a position description and expression of interest forms can be found at www.nopsema.gov.au/environmental-management/stakeholder-engagement-and-transparency/. Expressions of interest close 5pm AWST on 20 January 2018 and should be submitted to environment@nopsema.gov.au.





Improving access to environmental management information

NOPSEMA has endorsed a collaborative project to develop publicly available environmental reference cases that will capture common environment plan (EP) content and typical environmental management practices in offshore petroleum activities.

The offshore petroleum industry can prepare and use the reference cases to more efficiently prepare their EPs for proposed activities in areas such as the Great Australian Bight and the north-west shelf. Environment non-government organisations, fisheries groups, the community and other stakeholders will also be able to access, provide content, and comment on reference cases before an EP approval process starts.

Applying reference cases has the potential to reduce the size and complexity of EPs. This can result in a faster development process, more time to focus on key issues, reduced consultation burden on industry and stakeholders, reduced assessment timeframes and improved public access to information.

“NOPSEMA supports broader government initiatives to reduce regulatory burden on industry and improve transparency and access to information for stakeholders. The Reference Case Project contributes to each of these objectives,” said NOPSEMA CEO, Mr Stuart Smith.

The first four reference cases are being developed by National Energy Resources Australia (NERA). NERA, as an independent and trusted broker, have agreed to become the interim coordinator for the reference case project. NERA will work with industry and all stakeholders to better define the value from having a set of common industry environmental reference cases, and determine a sustainable model for the ongoing review, maintenance and development of future reference cases.





Preparing your EP five-year revision?

In the next few years, a large number of environment plans (EPs) covering operations for offshore facilities will reach the end of their five-year term. Titleholders are then required to submit a revised EP to NOPSEMA for assessment.

Typically, EPs for operating facilities are the most complex plans that NOPSEMA receives for assessment, as they involve long-term emissions and discharges, and large hydrocarbon inventories that pose a risk of spills. NOPSEMA is keen to find ways to improve the EP revision process to make it more efficient, and to achieve tangible improvements in offshore environmental management.

Currently, NOPSEMA is considering lessons learnt over the last five years and is preparing a communications program to be delivered in early 2018. The program will provide advice to the broader industry about NOPSEMA's expectations for five-year EP revisions. NOPSEMA will also meet with titleholders to provide them with individual feedback if our regulatory activities have identified areas for them to focus on.

Our goal is to provide titleholders with the advice and feedback they need to assist them in preparing a revised EP that improves upon the original. This, in turn, will result in a shorter assessment timeframe and a higher probability of acceptance.

NOPSEMA will soon contact titleholders with EPs covering offshore facilities' operations that are due for revision in 2018 and 2019. We will be enquiring about proposed submission dates. We will use this information to develop and implement our communications strategy and to inform our assessment planning.

Tips for preparing an EP revision:

- Be aware that the current requirements for EPs are under the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009, as amended in 2014.
- NOPSEMA's guidance on EP assessments is available on our website at www.nopsema.gov.au/environmental-management/assessment-process.
- There may be changes to the protection status of the environment in the area of your petroleum activity, such as new Australian Marine Parks, or changes to conservation plans for threatened species. The latest information is available at www.environment.gov.au.

NOPSEMA participates in Australia's largest oil spill response exercise

In September, more than 350 hundred participants from over 35 organisations took part in Australia's largest exercise to test control and coordination arrangements for a significant offshore oil spill.

Hosted by the Western Australian Department of Transport, in partnership with Quadrant Energy Limited, the exercise tested arrangements established under the state *WestPlan: Marine Oil Pollution* and *National Plan for Maritime Environmental Emergencies*. Participants included Western Australian and Commonwealth government agencies, offshore petroleum companies and the Australian Marine Oil Spill Centre (an industry oil spill response cooperative).

The exercise had participants role-play their respective functions over four days in a real-time, live-play simulation. The simulated event was a loss of well control from an offshore facility in Commonwealth waters, resulting in a prolonged release of oil into the environment that entered state waters. The first three days of the exercise focused on establishing control arrangements and action plans and mobilising response assets to Exmouth. On the fourth day, a number of teams were instructed to deploy oil spill equipment off the shore at Exmouth, as they would in the event of a real oil spill.

As the national regulator for offshore petroleum activities in Commonwealth waters, NOPSEMA was closely involved in the development and execution of the exercise. The realistic nature of the exercise provided NOPSEMA with a unique opportunity to practice and test its internal systems and procedures for regulating a titleholder's response to a significant oil spill. Early feedback from exercise coordinators and participants has been positive, with many of the tested arrangements and systems operating as expected.

Responsibility for oil spill preparedness and response

Under the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009, a titleholder must always be prepared to respond to an oil spill. NOPSEMA assesses this preparedness against strict requirements in a titleholder's environment plan (specifically the oil pollution emergency plan within it). If a plan is approved, then the activity can begin subject to NOPSEMA's ongoing compliance monitoring. If an oil spill occurs, the titleholder must respond in accordance with their approved plan. NOPSEMA monitors this response to ensure it complies with the plan. If some actions are not taken, or more action is required, NOPSEMA will direct the titleholder to undertake these actions.

One of the greatest strengths of oil spill preparedness and response arrangements is the cooperation between all parties involved. NOPSEMA strongly encourages all exercise participants to take a cooperative approach in addressing the outcomes of the exercise. After all, a lesson is not learnt until the required changes have been made. NOPSEMA also encourages the petroleum industry to continue its work with state agencies to refine and enhance their own control and coordination arrangements.



Photos courtesy of the Western Australian Department of Transport.



New guidance on transfer of operational control

In June 2017, following a public comment period, NOPSEMA published a guidance note on transfer of operational control. This note will assist incoming and existing titleholders in maintaining compliance with regulatory requirements when there is a change to the titleholder that has operational control of a well or petroleum activity.

A titleholder with operational control is defined as the entity that has responsibility for day-to-day oversight and management of the activity via its corporate policies, management systems, contracts and other arrangements.

The fundamental principle of the guidance is that permissioning documents (such as WOMPs or environment plans) are prepared for, and specific to, the titleholder with operational control. These documents need to demonstrate how the titleholder will oversee and manage the given activity.

Given the specific nature of WOMPs and environment plans (EPs), changes to the titleholder with operational control may present significant challenges for the incoming titleholder. For example, it may be difficult to demonstrate ongoing compliance with an in-force WOMP and/or EP that is reflective of a previous titleholder's policies, management systems, contracts and arrangements.

We encourage titleholders to ensure that revised WOMPs and/or EPs are ready to be accepted by NOPSEMA prior to transfer of operational control. This requires early consideration of compliance matters. The guidance note discusses mechanisms to achieve this.

Since the draft guidance was published, NOPSEMA has observed that titleholders are adopting the recommended approach and are experiencing fewer compliance issues as a result. The guidance note is available on the respective resources pages under environment and well integrity at www.nopsema.gov.au.



Photos courtesy of Shelf Subsea.

NOPSEMA participates in international diving seminar

Recently, NOPSEMA presented at the 25th Bergen International Diving Seminar in Norway. The seminar's focus was on smarter solutions to address the industry's future.

At the seminar, there were 169 participants from 77 different companies and organisations and 28 speakers from seven nations giving very useful insights into what is happening in the international diving industry. The speakers included representatives from Australian, United Kingdom and Norwegian regulatory authorities.

NOPSEMA's presentation provided the international diving industry with an overview of how we regulate offshore petroleum diving operations in Australia. The presentation outlined the health and safety improvements that we have seen in recent years as a result of assessment and inspection activities, for example:

- better emergency response preparedness through hyperbaric evacuation trials conducted for each diving project
- emergency shutdown testing and drills conducted for deck diving systems where these systems are used near a hydrocarbon facility
- diving bell emergency recovery drills applicable to vessel loss of DP and adjacent facility hydrocarbon release
- improvements in a bell diver umbilical rack design, allowing a bellperson to pay out a diver umbilical in a loss of DP or entangled diver scenario.

The seminar presentations also showcased some of the newest and latest technologies available to the diving industry. This included the use of telemedicine for saturation hyperbaric chambers, where medivac of an injured saturation diver cannot occur until decompression has been completed. The decompression duration can range from one to ten days depending on the diving depth. These telemedicine systems will measure a diver's vital signs in real time, wirelessly transmitting the information from inside the chamber to a specialist onshore doctor, who can then advise the dive medical technician treating the injured diver in the chamber.

NOPSEMA encourages the use of these types of systems for saturation chambers where their use can reduce the risks to an injured diver to ALARP. To read NOPSEMA's presentation see www.nopsema.gov.au/resources/presentations.

IRF maintains focus on industry performance

In October 2017, NOPSEMA attended the International Regulators' Forum (IRF) AGM in Copenhagen, Denmark. Member countries shared their experiences and explored topics of common interest, including:

- the impact of falling global petroleum prices on industry performance
- decommissioning and liability management
- subsea leak detection and well intervention in older subsea fields
- increases in hydrocarbon releases
- data analysis and information sharing
- supply chain quality control issues.

At the AGM, NOPSEMA led discussions on several issues including dynamic positioning (DP) system failures and presented case studies of such incidents. NOPSEMA highlighted the importance of sharing data to identify and respond to global trends. IRF members unanimously expressed their commitment to adopting coordinated compliance action. For more information, see the *DP systems' tolerance to human error: an international collaboration* article on page 10.

The new NOPSEMA Compliance Committee attracted interest from with IRF members with several commenting that the approach is valuable and a good example of responsible administration. This committee enables strategic oversight of compliance strategies and other regulatory and promotional activities. NOPSEMA also shared its experiences on managing stakeholder expectations, using the Reference Case Project as an example. This initiative is responding to industry demand for simple, standardised and consistent content in an environment plan. It reduces the regulatory burden and improves transparency and stakeholder access to information.

The next IRF conference will be held in the United Kingdom in 2018. NOPSEMA has offered to host the 2020 conference in Australia. For more information on the IRF see www.irfoffshoresafety.com.

Separate IRF working groups also met via teleconference during 2017 to address asset integrity, performance measures, safety culture and well integrity standards. Currently, a gap analysis on international well integrity standards is being shared with standard development organisations. As part of this work, NOPSEMA published an article on the Continual improvement of international well integrity standards in Issue 2 of *The Regulator* (www.nopsema.gov.au/resources/publications). The IRF will also hold a workshop at the 2018 Offshore Safety Conference in Aberdeen, Scotland to identify indicators that may assist in evaluating the strengths and weaknesses of safety culture.





Quarterly performance dataset – Q3:2017

Data is correct at the time of publication and may be subject to change as further information becomes available.

INDUSTRY ACTIVITY AND PERFORMANCE

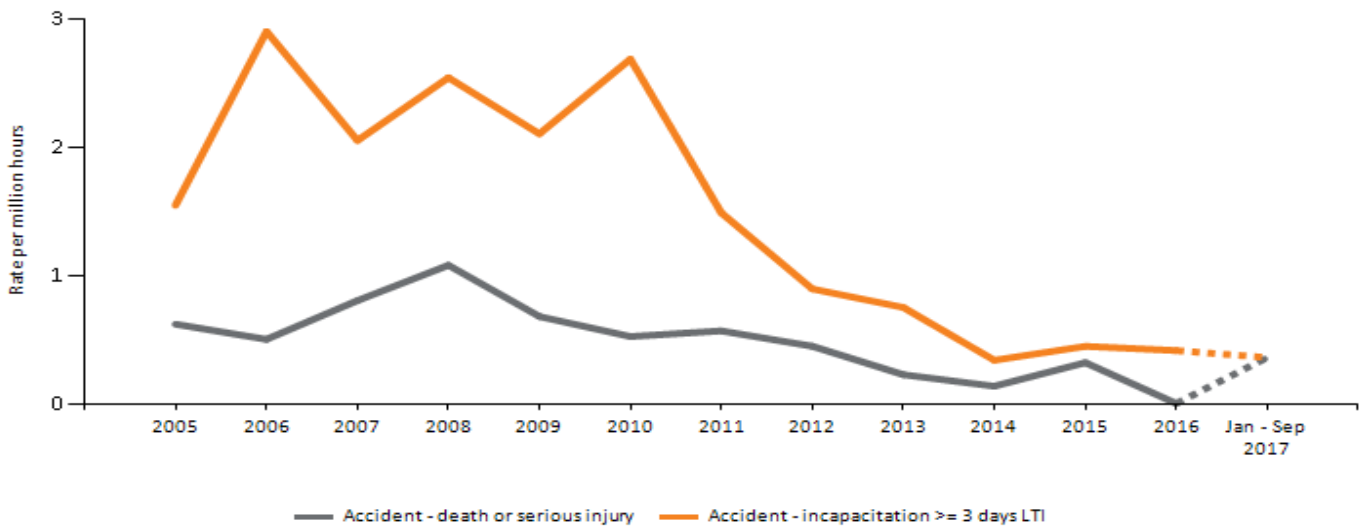
Submissions		
Category	Type of assessment	Number
Safety	Safety cases	29
	Scopes of validation	10
	Diving safety management systems	3
	Diving project plans	0
	Diving start-up notices	4
Well integrity	Well operations management plans	7
	Well activity applications	3
	Final abandonment reports	9
Environment	Environment plans	9
	Environment plan summaries	7
	End of an environment plan (regulation 25A)	21
Other	Petroleum safety zone application	1
	National Offshore Petroleum Titles Administrator request for title related information	12
Total		115

Incidents		
Category	Type of incident	Number
People safety	Accidents	
	Death or serious injury	2
	Incapacitation >= 3 days lost time injury	1
	Injuries (total recordable cases)	10
	Total injuries	13
	Dangerous occurrences	
	Could have caused death or serious injury	9
	Could have caused incapacitation >= 3 days lost time injury	1
	Total dangerous occurrences (people safety)	10
Process safety	Dangerous occurrences	
	Damage to safety-critical equipment	14
	Other kind needing immediate investigation	7
	Uncontrolled hydrocarbon release >1–300 kg	6
	Uncontrolled hydrocarbon release >300 kg	0
	Uncontrolled petroleum liquid release >80–12 500 L	2
	Unplanned event – implement emergency response plan (including false alarms)	35
	Total dangerous occurrences (process safety)	64
	Total dangerous occurrences (people and process safety)	74
Well integrity	Well integrity incidents	
	Failure of hydrostatic pressure – blowout preventer closure and positive well pressure	1
	Uncontrolled hydrocarbon release >300 kg	1
	Well-related equipment damage or failure	2
	Potential well-related equipment damage or failure	4
	Total well integrity incidents	8
Environment	Reportable environmental incidents	
	Hydrocarbon vapour/petroleum liquid release	3
	Chemical release	1
	Total reportable environmental incidents	4

Note: Uncontrolled hydrocarbon releases/spills may have been reported as an OHS incident and as an environmental incident. Injuries may have been reported as a total recordable case and as an accident.

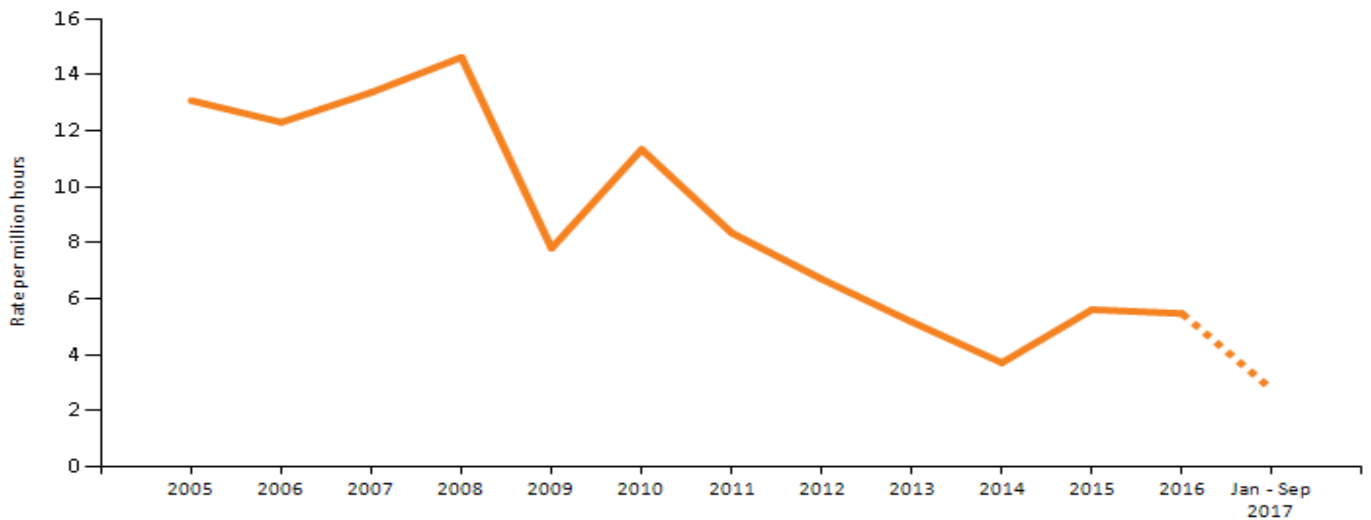
INDUSTRY PERFORMANCE INDICATORS

Accidents



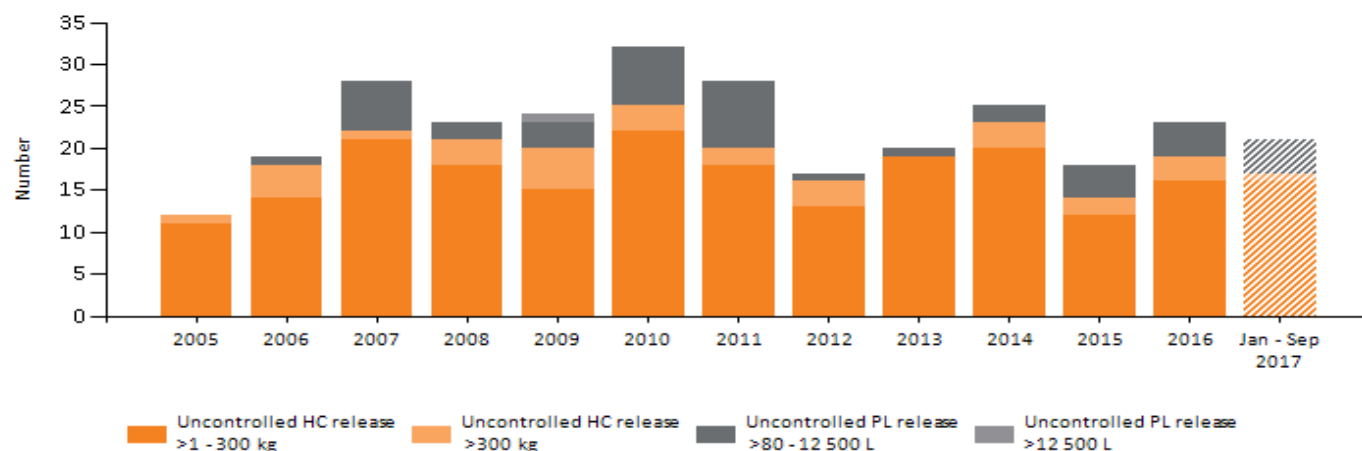
During the quarter, three accidents (including two serious injuries) were reported to NOPSEMA.

Total recordable cases - injuries



During the quarter, 10 injuries (Total recordable cases) were reported to NOPSEMA. This included four medical treatment injuries, three alternative duties injuries, one lost time injury and three major injuries. The annual overall injury rate (based on total injuries reported to NOPSEMA on a monthly basis) has declined from 5.47 per million hours worked in 2016 to 2.75 at the end of the third quarter of 2017.

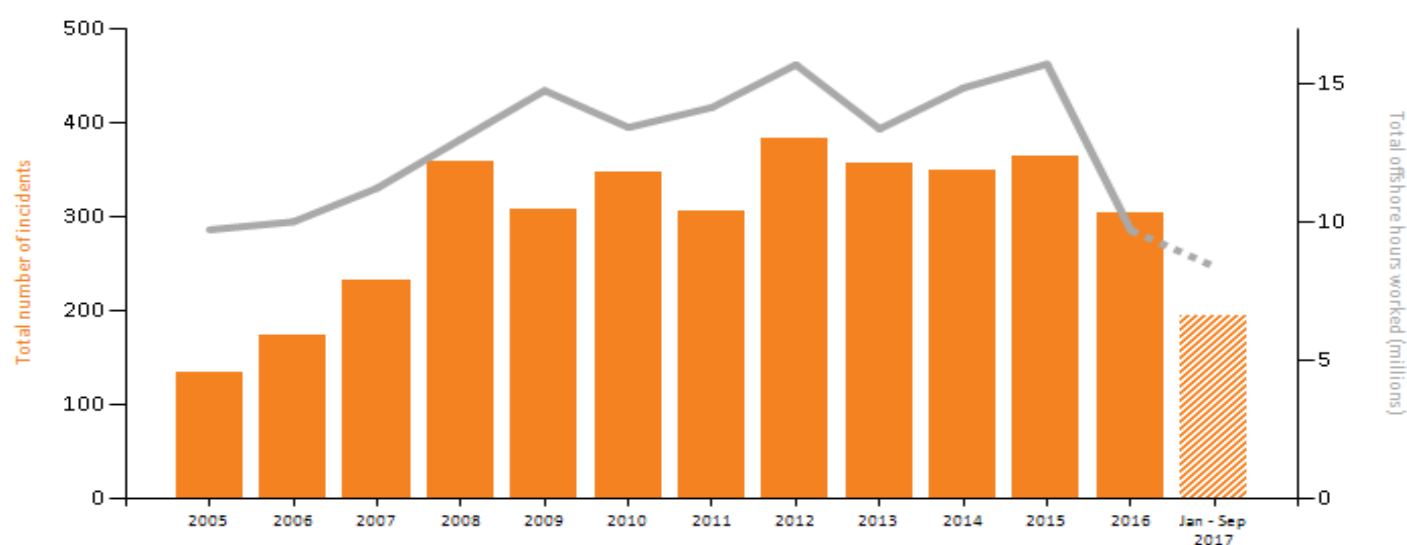
OHS hydrocarbon releases



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

During the quarter, NOPSEMA was notified of six hydrocarbon gas releases, all of which were classified as low level (>1–300kg).

Dangerous occurrences



During the quarter, 74 dangerous occurrences were reported to NOPSEMA, which is above the quarterly average of 71 for the last two years. The majority were unplanned events requiring emergency response plan implementation (47%) followed by damage to safety-critical equipment (19%).

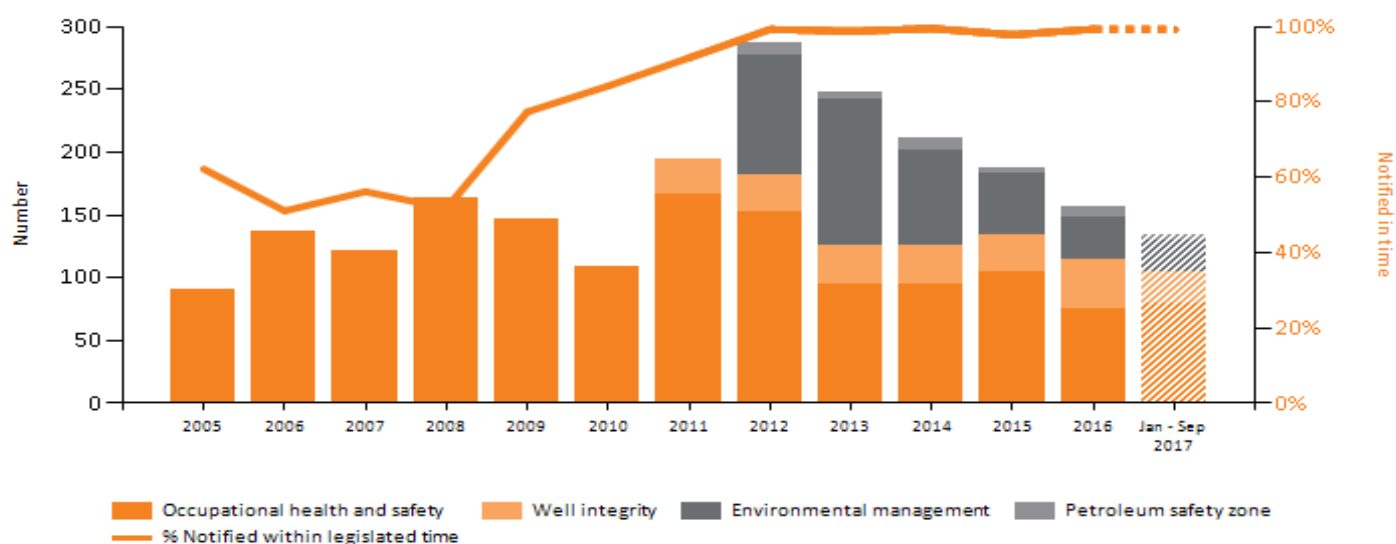
NOPSEMA ACTIVITY AND PERFORMANCE

Improvement and compliance		
Type of activity	Category	Number
Inspections	Occupational health and safety	32
	Well integrity	2
	Environmental management	13
	Total inspections	47
Enforcement actions*	Occupational health and safety	3
	Environmental management	3
	Total enforcement actions	6

*Excludes verbal warnings/advice, directions, investigation notices and inspection recommendations.

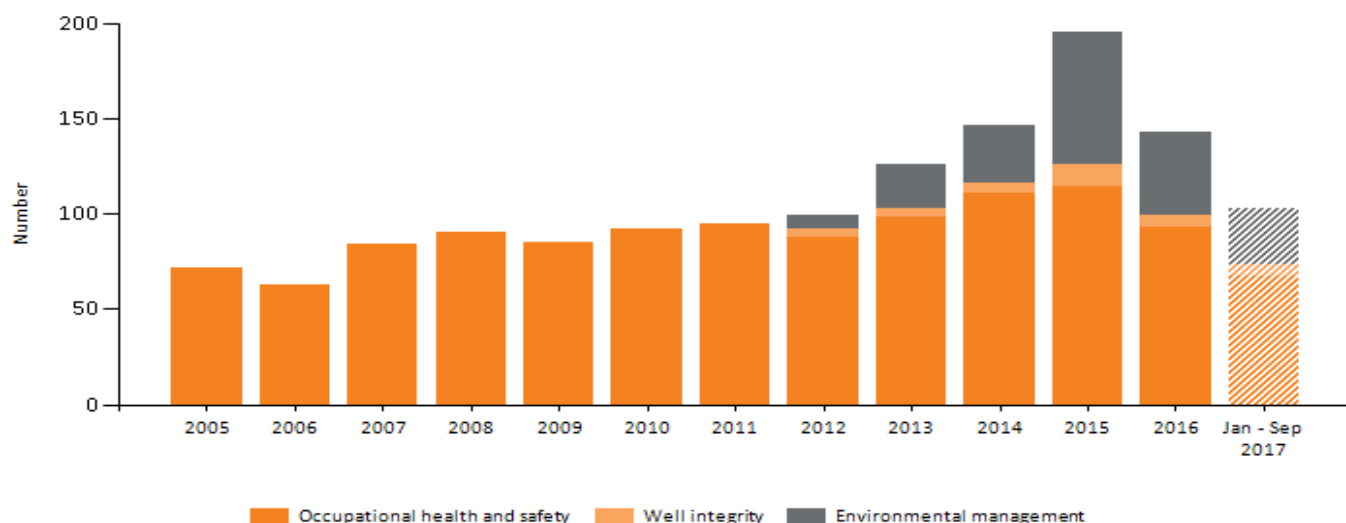
NOPSEMA PERFORMANCE INDICATORS

Notified assessments



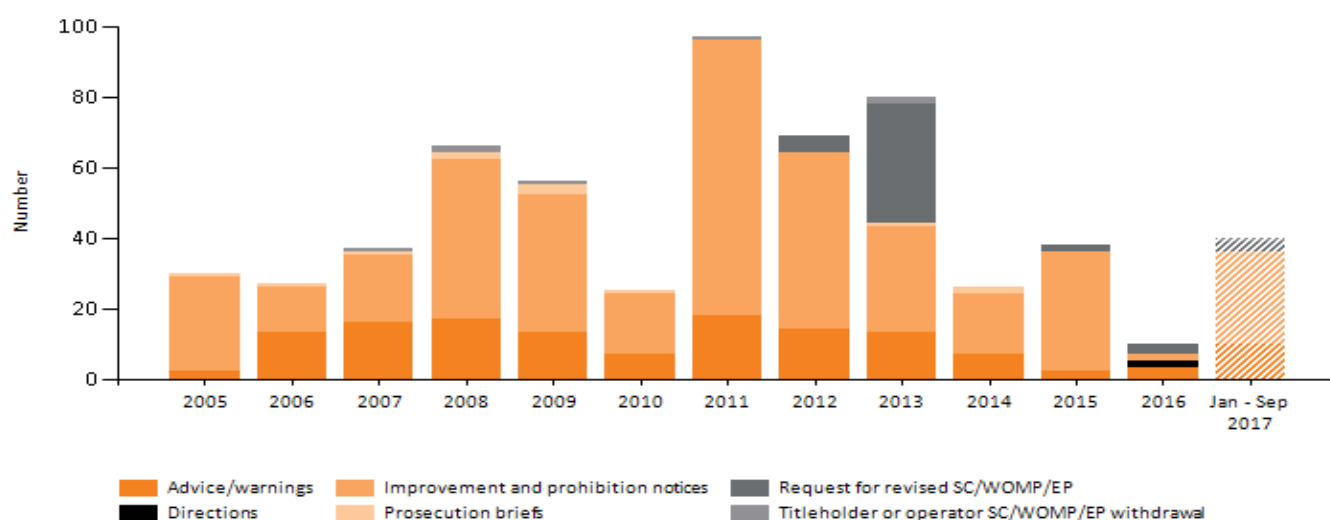
During the quarter, 97% of all assessments were notified within legislated timeframes. Assessments with legislated timeframes are the only type of assessment included in the 'notified in time' data. However, it is NOPSEMA's policy to apply a timeframe on all assessment types.

Inspections



During the quarter, NOPSEMA conducted 47 inspections across 55 facilities and petroleum activities (a single inspection may cover multiple facilities).

Enforcement actions



During the quarter, NOPSEMA issued six enforcement actions. These actions included one OHS improvement notice, one OHS prohibition notice, one OHS written advice/warning, one request for a revision to an environment plan and two environmental management written advice/warnings.



Schedule of events

March 2018

20–23 March Offshore Technology Conference Asia, Kuala Lumpur

May 2018

30 April–3 May Offshore Technology Conference, Houston

14–17 May APPEA Conference and Exhibition, Adelaide

June 2018

5–8 June International Regulators' Forum Annual General Meeting and Conference, Aberdeen

Events listed are those at which NOPSEMA is presenting, exhibiting or has an organisational role.
For presentations at past events visit www.nopsema.gov.au/resources/presentations.