

Annual Offshore Performance Report

Safety and environmental performance of
Australia's offshore petroleum industry

to 31 December 2018



2018 year in review

Welcome to the Annual offshore performance report for the 2018 calendar year. During 2018, NOPSEMA was pleased to see industry largely maintained its performance protecting workers and the environment. Most importantly, for the sixth consecutive year there were no fatalities. Industry must remain vigilant to maintain this result and continue efforts to monitor lead indicators.



While there were no fatalities, there were eight serious injuries reported in 2018 (an increase from four in 2017). Serious injuries reported in 2018 included broken bones and torn or ruptured tendons. These types of injuries have serious impact on the people involved and should be very concerning to facility operators. Operators must investigate the causes of all injuries and implement all necessary improvements to prevent their reoccurrence. While NOPSEMA expects the day-to-day safety of the workforce to be at the forefront of all operations, a crucial aspect of offshore operations is recognising the importance of preventing the potential catastrophic consequences of a major accident event (MAE).

Preventing MAEs is essential to protecting the safety of people at facilities and the environment. The key focus when reviewing the causes of an event should be determining whether it was a precursor to a MAE. Experience has shown that incidents resulting in personal or environmental impact often do not present risk of a MAE. Conversely, other incidents where there was no injury or environmental impact could have resulted in a MAE.

While the eight serious injuries reported in 2018 are still a concern, on review, none of them suggest systemic failures that could lead to a MAE resulting in multiple fatalities. NOPSEMA believes that an undue focus on these incidents may lead to complacency on weak signals to MAEs.

In 2018, there were signs of improvement in the relationship between seismic operators and fishers, but there is still a long way to go and the petroleum industry needs to invest in wider and more successful initiatives to improve relationships. However, we also identified areas requiring increased attention. In particular, management practices associated with late life assets and progress in addressing challenges in decommissioning suspended wells have both been growing concerns for NOPSEMA. We also observed a rising trend in low level hydrocarbon gas releases from late life assets. NOPSEMA is continuing to allocate resources and efforts to ensure strong safety and environmental outcomes are achieved by all industry participants.

In 2018, NOPSEMA continued to focus regulatory activities on four key strategic

compliance improvement areas through three lenses: **Past (preventing old accidents), Present (find one, fix many) and Future (emerging trends)**. The four key strategic compliance improvement areas were: **preventing major accident events; preventing and managing a loss of well control; improving incident response and spill source control; and improving oil spill response arrangements**. Each of these focus areas were explored by analysing past incidents and high potential events. We then applied these learnings to our assessments and inspections to prevent past incidents from re-occurring. Through find one fix many approach we put particular focus on sharing learnings from current incidents and examples of best practice to influence positive behavioural change within the industry.

Sharing insights and exchanging knowledge are essential elements of continuous improvement. As a result of such sharing, NOPSEMA saw positive improvement in cooperative risk management solutions in oil spill preparedness and response through industry and government participation in the Oil Spill Cooperative Forum.

2018 year in review (continued)

NOPSEMA also drove improvement through our leadership of a work program on the tolerance of dynamic positioning systems on human error and study into well integrity issues in Australia's offshore industry. NOPSEMA will continue to hold a range of workshops to facilitate cooperation and openness on safety, well integrity and environmental performance.

With more than half of Australian offshore facilities older than 20 years and some exceeding 50 years, NOPSEMA recognises the prevalence of ageing assets, appropriate maintenance and the implications of late-life transfers as key regulatory issues for the offshore oil and gas industry. In late 2018, NOPSEMA conducted a series of inspections focused specifically on ageing assets and facilities in Commonwealth offshore areas. A number of common issues were identified as a result of these inspections and compliance and enforcement actions were taken by NOPSEMA to ensure rectification. Inspection results highlighted the need for improved ageing asset management to respond to the problems identified. It is also concerning to note that a large number of the 41 uncontrolled hydrocarbon releases reported in 2018 came from late life assets.

In terms of looking at future trends, NOPSEMA is working closely with the Department of Industry, Innovation and Science and the National Offshore Petroleum Titles Administrator to develop guidance for a framework on late life assets and explore legislative and policy solutions for the management of decommissioning offshore petroleum wells and infrastructure. Given NOPSEMA's concerns about safety issues related to ageing assets, we support enhanced scrutiny of late-life facilities as they go through the transfer of asset process.

In the meantime, NOPSEMA recognises that regulatory pressure must continue to be applied to ensure

proper maintenance and management of ageing facilities. Titleholders must be held to account for undertaking decommissioning practices, including the appropriate plugging and abandonment of wells which can represent a significant portion of total decommissioning costs.

Where necessary, NOPSEMA will take action to ensure that appropriate decommissioning outcomes are achieved. In some cases this has come at substantial cost to entities where failure to maintain safe systems and facilities has resulted in intervention and significant financial loss. In one instance in 2018, a titleholder incurred an additional cost of around AUD\$30 million in relation to the extended shutdown of a facility undergoing a late-life transfer in order to address integrity deficiencies and comply with NOPSEMA's enforcement actions.

Throughout 2018 NOPSEMA progressed major transparency initiatives such as the establishment of NOPSEMA's Community and Environment Reference Group, which provides NOPSEMA with their perspectives on the regulation of offshore petroleum environmental management. During the year NOPSEMA also worked with DIIS on the implementation of amendments to the Offshore Petroleum and Greenhouse Gas Storage Environment Regulations 2009 (Environment Regulations). These amendments introduced a 30-day public comment period for seismic and exploratory drilling proposals. This public comment process will provide the community with an additional opportunity to have their say on the proposed environmental management of exploration activities before NOPSEMA commences its formal assessment. NOPSEMA believes this is a major advance in the transparency of the offshore regime.

Over the past year there has been an increasing focus on the role and responsibilities of Health and Safety Representatives (HSRs). In

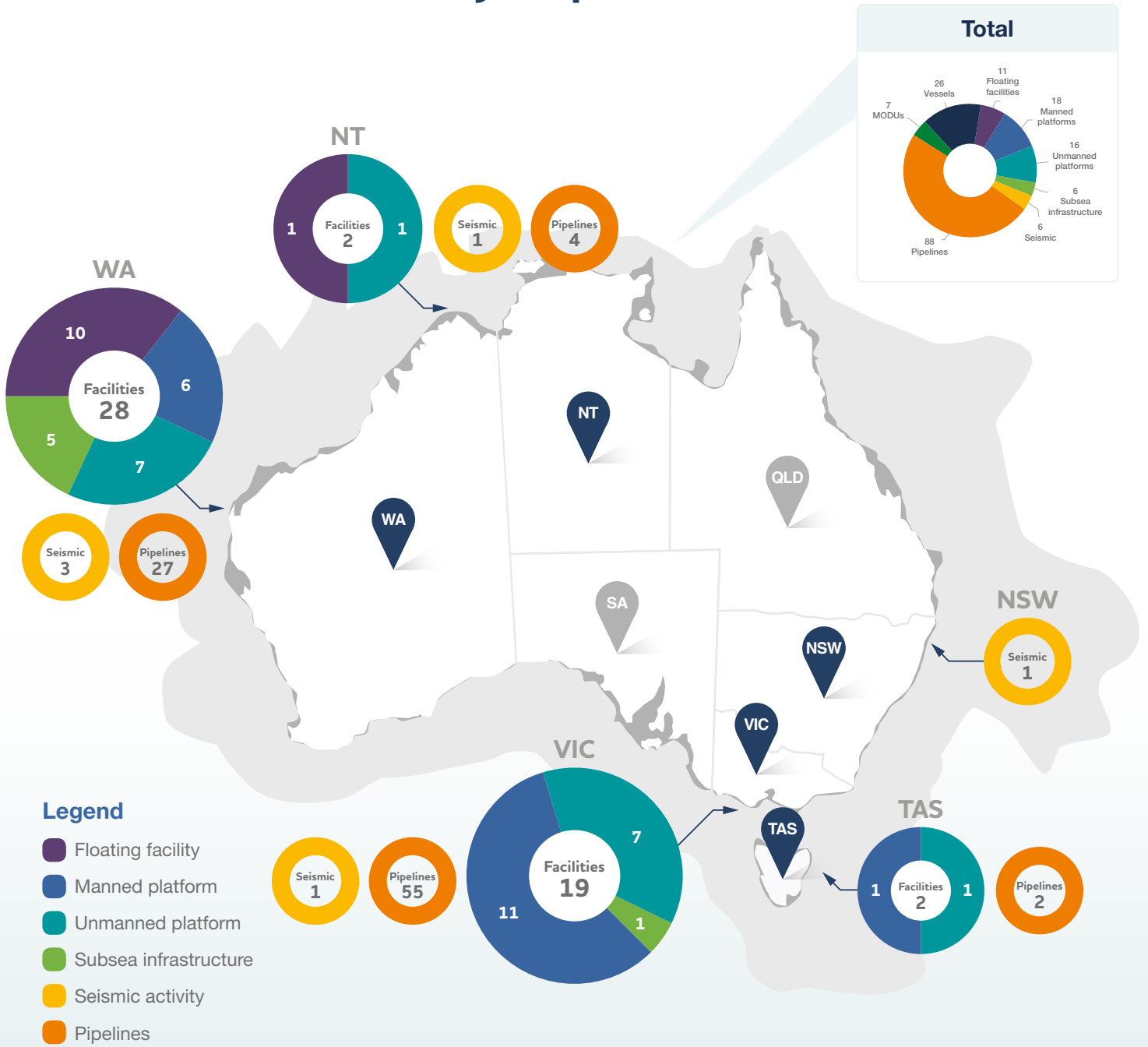
response NOPSEMA has sought to raise awareness of their role and engage them more in ensuring sound health and safety practices on offshore facilities. We are pleased that industry and the unions share our acknowledgement of the importance of HSRs. In recognition of their important contribution, the inaugural HSR Forum has been scheduled to take place in June 2019. This forum is being organised by a tripartite committee with representatives from government, industry, and unions, and will provide an opportunity for HSRs to engage with their peers, regulatory authorities, and industry safety bodies. During 2018, concerns were raised about the experiences of some HSRs, particularly, those from some contractors and subcontractors. NOPSEMA has been taking an increasing interest in this area and will continue to pursue it through for discussion at the coming forum and more direct action where appropriate.

There will be many opportunities in 2019 and beyond to exchange perspectives and assess performance. NOPSEMA looks forward to continuing our constructive exchange with our stakeholders and expects industry to maintain its high standards in safety and environmental management performance.



Stuart Smith
Chief Executive Officer

2018 offshore activity map



Australia wide

7 mobile offshore drilling units (MODUs)



Note: MODUs have conducted at least one activity in NOPSEMA's jurisdiction and may have been in more than one state/NT adjacent area.

19 vessels



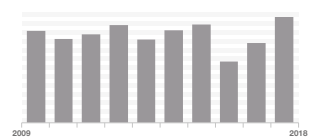
Note: vessels have conducted at least one activity in NOPSEMA's jurisdiction and may have been in more than one state/NT adjacent area.

910 wells



Covered under well operations management plans.

Total offshore hours worked



↑ 16.9 million hours worked in 2018 (up from 12.8 million in 2017)
70% of hours fixed facilities, 30% of hours mobile facilities

Pathways to improvement

NOPSEMA has selected these pathways to improvement in accordance with its Compliance strategy¹ to facilitate improvements in industry performance across health and safety, well integrity and environmental management.

Lenses



Past (preventing old accidents)

Analyse previous incidents and high potential events to test for risk to As Low As Reasonably Practicable in assessments and inspections.



Present (find one, fix many)

Examine and share learnings from current non-compliances, incidents and best practices to prevent future occurrences and enhance existing good practice.



Future (emerging trends)

Address transparency expectations. Remove unnecessary regulatory burden and improve efficiency. Look elsewhere for better practices and tools to apply.

Focus areas

These focus areas supplement broader compliance initiatives and drive improved safety, well integrity and environmental outcomes.



Pathways to improvement in action

NOPSEMA contributes to improved industry performance in each of the focus areas through our assessment, inspection, investigation, enforcement and advice and promotion activities. The outcomes of these activities often culminate in articles being published in our quarterly magazine *the Regulator*. Highlights from 2018-19 can be found at the 'Publications' page at nopsema.gov.au.



Preventing major accident and loss of containment events



NOPSEMA's primary focus is preventing MAEs to protect workforce safety and the environment. The duty to prevent MAEs is a shared responsibility across all industry participants. However, NOPSEMA's role is often highlighted as our regulatory activities continue to identify situations where inadequate or failed barriers and systems are likely to lead to a MAE. Examples from 2018-19 include:

- Is safety, or safety collaboration, a competitive advantage? (Issue 1: 2019)
- Improvement in vessel design in a hydrocarbon environment (Issue 4: 2018)
- Best practice for managing impaired pipeline subsea isolation valves (Issue 4: 2018)
- Exposure to H2S—Are you prepared? (Issue 3: 2018)
- Preventing the recurrence of water jetting incidents (Issue 3: 2018)
- Industry acts to address tolerance of dynamic positioning systems to human error (Issue 3: 2018)
- The importance of safe diving operations (Issue 3: 2018)
- When do you need to submit a safety case revision? (Issue 2: 2018)
- Addressing challenges to operational integrity of contracted equipment (Issue 2: 2018)
- Responding to the unexpected while complying with the safety case (Issue 2: 2018)
- NOPSEMA prevents major accident events (Issue 1: 2018)
- False alarms during maintenance of safety-critical equipment (Issue 1: 2018)
- Effective frontline hazard identification tools (Issue 1: 2018)
- Effective control of work systems critical to preventing incidents and injuries (Issue 1: 2019)

Preventing and managing loss of well control



Throughout 2018, NOPSEMA performed inspections to identify, analyse and share information on the prevalence, management and remediation of well integrity failures. The following contain valuable lessons learnt:

- Adapting to changing well conditions (Issue 1: 2019)
- Moving towards a common language in well integrity (Issue 1: 2019)
- Opportunities for improvement in well integrity management (Issue 4: 2018)
- Sharing insights on best practice for well integrity and control (Issue 2: 2018)
- Preventing and managing loss of well control: A study of well integrity failures in offshore Australia (Issue 1: 2018)

Improving response and spill source control



Through rigorous assessment, inspection and enforcement processes NOPSEMA is ensuring titleholders are best prepared to launch all appropriate mitigating response actions in the unfortunate case that a MAE does occur. Lessons learnt from the application of these processes and opportunities for collaboration include:

- Premier Source Control Workshop (Issue 1: 2019)
- Contingency measures for subsea drilling operations (Issue 4: 2018)
- Environment inspections focus on source control (Issue 2: 2018)

Improving oil spill preparedness arrangements



NOPSEMA is driving strategic industry wide efforts to promote the expansion and enhancement of industry cooperation as a mechanism to achieve continual improvement in industry oil spill preparedness arrangements. These efforts and NOPSEMA's expectations are discussed in the following:

- Effective testing of oil spill response arrangements (Issue 1: 2019)
- NOPSEMA's expectations of industry to improve oil spill response (Issue 3: 2018)
- Maintaining world class oil spill response capability (Issue 2: 2018)
- What role do titleholders play in safety case acceptance? (Issue 1: 2018)

Others



The above focus areas supplement a diverse range of compliance initiatives, including:

- Inaugural tripartite Health and Safety Representative Forum (Issue 1: 2019)
- Improving cooperation between the seismic and seafood industries (Issue 4: 2018)
- Managing biosecurity risks (Issue 3: 2018)
- Improving environmental impact assessments for seismic surveys (Issue 3: 2018)

¹For more information see the 'Compliance strategy' page at nopsema.gov.au.

Offshore performance data summary



There was a heightened level of industry activity in 2018, as reflected by an unprecedented 16.9 million hours worked offshore reported by facility operators. This was a notable 31% increase on the 12.8 million hours worked in 2017 (following a 32% increase from 2016 to 2017) and is the highest number since NOPSEMA (formerly NOPSA) began recording data in 2005.

These cumulative increases are reflective of major change in offshore activity over the past few years, as new liquefied natural gas (LNG) facilities have come online and Australia's LNG exports have boomed. Experience shows that increased industry activity levels may elevate risk due to the sheer volume of activity and strain on industry resources. NOPSEMA is pleased to report that key industry performance indicators show that NOPSEMA and industry have largely been able to manage this escalation in commissioning and production activity without compromising workforce safety standards.

Across the board the rate of occurrence for key industry performance indicators remained stable or decreased compared with 2017, despite increases in the total numbers. Incident rates on offshore facilities are calculated using total offshore hours worked as a normaliser (i.e. number of incidents per million hours worked). This allows for a more reliable comparison of incident data over time as it takes into account variations in industry activity levels from year to year.

For example, while there was an 13% increase in the total number of injuries reported in 2018 (59 compared to 52 in the previous year), when evaluated in context with industry activity levels the injury rate actually decreased from 4.07 injuries per million hours worked in 2017 to 3.48 injuries per million hours worked in 2018. This is the lowest recorded injury level to date, and continues a reassuring downtrend in the recordable injury rate in recent years.

There were 14 accidents reported in 2018. Eight of these were serious injuries² resulting in hospitalisation (due to fractures, ruptured tendons, lacerations etc.) and six other injuries

resulting in incapacitation \geq 3 days lost time. Although this is an increase on the 10 accidents reported in 2017, the overall accident rate in 2018 was only slightly higher than previous years at 0.83 accidents per million hours worked (noting the effect of a small dataset for comparison).

There were 386 dangerous occurrences³ reported by operators in 2018, up 33% from 291 in 2017. However as reported offshore hours also increased by 31%, the resulting incident rate of 22.79 per million hours worked remains almost on par with last year's 22.77 per million hours worked (the lowest recorded in 5 years).

Despite the 2018 accident rate remaining relatively comparable to recent years, there has been a notable increase in the number of near miss incidents (classified as 'could have caused death or serious injury'). There were 26 incidents reported in 2018 (up from 16 in 2017), the rate went from 1.25 to 1.54 incidents per million hours worked. This increase was largely due to incidents that occurred during pre-commissioning and hook-up activities for new facilities. The most common contributors for such incidents were electrical hazards and dropped object events that had the potential to cause death or serious injury. NOPSEMA investigated these events, shared the lesson learnt with industry through operator liaison meetings, published articles in *the Regulator* and conducted topic focused inspections to mitigate further events.

A record high 41 hydrocarbon releases were reported by duty holders in 2018. The majority of these were low volume hydrocarbon gas or petroleum liquid releases. As mentioned previously, a significant

number of these hydrocarbon releases were attributed to older production facilities – over half were from facilities greater than 20 years of age.

Duty holders notified NOPSEMA of 60 well integrity incidents in 2018, more than double the previous year's total of 27. However the majority of these reports were attributed to a single titleholder, and largely involved testing failures of christmas tree valves which required remedial work. This may also be related to ageing facilities. In response NOPSEMA is increasing the number of well integrity inspections focused on ageing assets.

NOPSEMA commends the initiatives of titleholders to improve subsea well source control planning through the application of IOGP/IEPCA Source Control Emergency Response Planning Guide for Subsea Wells (Report 594). This guide represents a step forward in industry best-practice for improving timelines and probability of success when deploying capping stack technology in a loss of well control incident. NOPSEMA, APPEA and titleholders are working together through several initiatives to implement the recommendations within the guide and further improve subsea well source control preparedness.

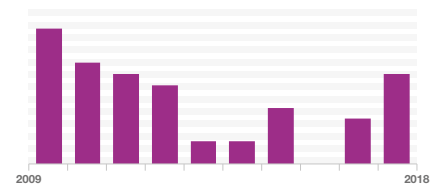
In 2018 there was a 42% increase in reportable environmental management incidents, albeit from a small dataset (from 12 in 2017 to 17 in 2018). NOPSEMA investigated these incidents, confirming that none resulted in serious environmental harm, and required titleholders to implement measures to prevent recurrence and improve environmental management practices. The majority (53%) of these incidents were hydrocarbon releases.

² The serious injuries as a result of slips, trips and falls, and pinch-point hazards.

³ Implementation of emergency response plans remain the most commonly reported dangerous occurrence and were largely the result of false alarms or inadvertent manual call point activation.

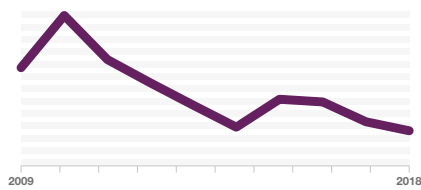
2018 key performance data

Fatalities and serious injuries



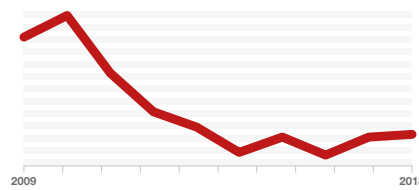
No fatalities
 ↑ 8 serious injuries (up from 4 in 2017)

Injuries



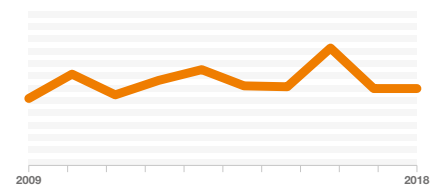
↓ 3.48 injuries per million hours worked (down from 4.07 in 2017)
 59 injuries, including: 8 serious injuries;
 6 LTI >= 3 days; 1 LTI < 3 days; 20 alternative duties injuries; 24 medical treatment injuries
 LTI = lost time injury

Accidents



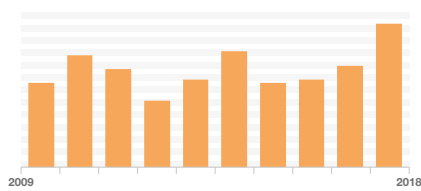
↑ 0.83 accidents per million hours worked (up from 0.78 in 2017)
 ↑ 14 accidents (up from 10 in 2017)

Dangerous occurrences



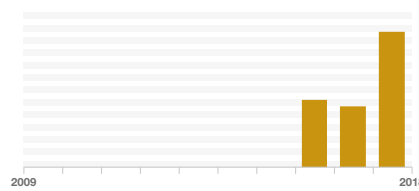
↑ 22.79 dangerous occurrences per million hours worked (up from 22.77 in 2017)
 ↑ 386 dangerous occurrences (up from 291 in 2017)

Hydrocarbon releases



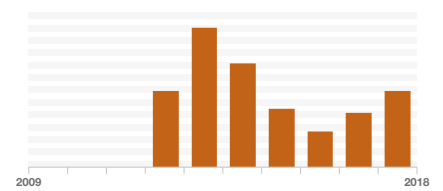
↑ 41 hydrocarbon releases (up from 29 in 2017)

Well integrity incidents



↑ 60 well integrity incidents (up from 27 in 2017)
 Note: well integrity incidents only became a separate category when changes to the Offshore Petroleum and Greenhouse Gas Storage (Resource Management and Administration) Regulations 2011 commenced in 2016

Environment reportable incid.



↑ 17 environmental reportable incidents (up from 12 in 2017)



NOPSEMA online resources

For this year's report we have significantly revised the format to better convey the key issues and for ease of use.

The report still provides key statistical information obtained through the full range of NOPSEMA's regulatory activities. NOPSEMA also publishes extensive information on NOPSEMA's activities and priorities, relevant legislative reform, and emerging industry issues in NOPSEMA's quarterly magazine, *the Regulator*, which is available at the 'Publications' page at nopsema.gov.au.

There is a variety of other information and resources available on NOPSEMA's website. This includes publications on topics that may be of interest to the community, such as fact sheets on marine seismic surveys, oil spill modelling, oil spill response strategies and arrangements.

NOPSEMA also continuously collects and publishes data on the safety, well integrity and environmental management performance of the industry, as well as its own regulatory performance and activity. Members of the public can view annual and quarterly data on industry performance indicators, such as incident rates, hydrocarbon releases and international benchmarks. There is also the option to view and compare data from previous years. Full datasets are available at the 'Data reports and statistics' page at nopsema.gov.au.

In addition to this, a subscription service is available for interested stakeholders to sign up to receive the latest media releases, news announcements and regulatory alerts. For more information, go to nopsema.gov.au.



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 have been conferred) to 31 December 2018.



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