Issue 3 : 2018

the REGULATOR

National Offshore Petroleum Safety and Environmental Management Authority

NOPSEMA

nopsema.gov.au

ABOUT NOPSEMA

The National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) is Australia's independent expert regulator for health and safety, environmental management and structural and well integrity 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 that document and demonstrate 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.

For more information visit our website at nopsema.gov.au.

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FEEDBACK

NOPSEMA welcomes feedback from our stakeholders. Please direct all enquiries about this publication to communications@nopsema.gov.au.

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Contents

Message from the Chief Executive

The Australian offshore petroleum industry is subject to an objective-based regulatory regime where responsibility for ensuring the health and safety of workers and the protection of the environment lies with those who create the risk. This doesn't mean the industry regulates itself, rather it must demonstrate to NOPSEMA that the risks created by offshore petroleum activities will always be reduced to a level that is as low as reasonably practicable (ALARP) with acceptable environmental impacts.

A key strength of the regime is that it is adaptable, flexible and scalable to the individual circumstances of an activity and the environment in which that activity is proposed to take place in. A central tenet of the regime is *continuous improvement* where the industry is encouraged to be innovative in their approach to managing their activities in a way that best achieves ALARP and acceptable levels of risk and impact. While continuous improvement can be a challenge for the industry in deciding how activities are to be managed and trying to meet NOPSEMA's expectations, the regime's flexibility provides assurance to all stakeholders that any potential change in risk will continue to be managed to the highest practicable standard.

Over the last financial year, NOPSEMA has kept close regulatory oversight of how the industry has managed such a change in risk during a period of unprecedented commissioning activity. This type of activity presents heightened risks with the workforce often working shifts of 12 hours a day, on a facility made up of thousands of tonnes of infrastructure and moving parts, all being tested before highly combustible materials are introduced whilst isolated hundreds of kilometres from the nearest coastline. As expected, notifiable incidents for occupational health and safety increased by 30 percent during this time; the good news is that the majority were minor, many were false alarms, and none resulted in loss of life or loss of well control. The bad news is that they occurred at all and indicate scope for improvement.

As the independent offshore petroleum regulator, it is NOPSEMA's role to promote a culture of continuous improvement in addition to ongoing compliance with the regulatory regime. This role is especially important during periods of change where project deadlines may be a key driver for the industry. Our preference is to perform this role through educational campaigns and providing direct advice through our assessments and inspections. For example, the assessment process provides the industry with a limited number of opportunities to modify their proposed management or provide further information before a decision is made to approve or reject a key permissioning document. Our inspections focus on verifying the industry is managing their activities in compliance with the approved permissioning document(s) and are continuing to meet all regulatory requirements. These inspections typically produce a number recommendations for improvement, for example, in the last financial year NOPSEMA issued 1325 recommendations to industry as a result of 155 inspections. Where education and advice is insufficient to deliver improved compliance, then NOPSEMA will consider enforcement action including prosecution.

The expectation of continuous improvement also applies to the performance of NOPSEMA whether it is in regard to education, advice, assessment, monitoring or enforcement. For example, while the regulator has no role in selecting or releasing offshore areas for petroleum activities, NOPSEMA recognises growing interest within the community in activities proposed to take place in frontier areas like the Great Australian Bight. NOPSEMA has therefore sought to undertake greater engagement in these frontier areas, for example, our participation in a series of open days across four locations in South Australia. The open days sought to provide the community with an opportunity to learn and ask questions about the administration and regulation of the Australian offshore petroleum industry. For members of the community that could not attend, NOPSEMA has published responses to a number of common questions raised during the open days as well as during other engagements.

The process of continuous improvement demands sustained effort and cooperation, and while our views and expectations may vary, protecting the health and safety of the offshore workforce and the environment must remain our common goal. I am confident that, if we work together, we can continue to meet present and future challenges and deliver strong safety and environmental outcomes.

Stuart Smith, CEO

Engaging with stakeholders on environmental management

NOPSEMA continues to strive to increase community confidence in the offshore petroleum regulatory regime by engaging with its stakeholders on environmental management matters in an effective and meaningful manner.

NOPSEMA welcomes face-to-face meetings and regularly briefs Commonwealth, state and local government representatives; environmental non-government organisations; fishing associations; other marine users and community stakeholders. This type of engagement typically seeks to better inform stakeholders of our regulatory processes and provide them with an opportunity to raise any issues or concerns relating to environmental management directly with the regulator.

To promote various initiatives and gain feedback, NOPSEMA frequently hosts and participates in a number of public and industry workshops and forums. For example, NOPSEMA hosted a workshop for the multi-agency Transparency Initiative in June 2018 to update stakeholders on the outcomes and future work of the initiative. In March 2018, NOPSEMA established a Community and Environment Reference Group which offers a new avenue for the regulator to receive community views on our performance. These workshops and forums provide NOPSEMA with valuable insight into the views of our stakeholders and assists the regulator in addressing concerns and prioritising areas for improvement.

Providing engagement opportunities for the broader community is also a key priority for NOPSEMA and is reflected in our participation in a number of open days and community events. For example, NOPSEMA participated in a series of open days across four locations in South Australia in August 2018. A number of other Commonwealth and state government agencies involved in the offshore oil and gas lifecycle also participated to provide the community with an opportunity to learn more about the administration and regulation of the industry. The sessions were well-received with many interested members of the community attending as well as individuals from commercial fisheries, environmental groups, local government, small business and tourism.

If you are interested in engaging with NOPSEMA on environmental management matters, or wish to learn more about the regulation of the offshore oil and gas industry, visit nopsema.gov.au/community-information. If you are interested in receiving the latest news and information subscribe to environmental management news at nopsema.gov.au/subscribe.

Community questions on offshore petroleum

NOPSEMA recognises community interest in offshore oil and activities continues to grow. We are often asked question of a similar nature and in response we have prepared the information below to address frequently asked questions.

NOPSEMA assessment process

1. Can NOPSEMA reject proposed drilling activity given the community's concern?

NOPSEMA is required by law to decide to accept or reject a proposed activity based solely on its merits (safety, environment or well integrity) and is legally prohibited from making regulatory decisions based on principle. NOPSEMA has no role in the selection or granting of offshore petroleum titles, which give companies the exclusive right to explore and produce oil and gas in offshore areas. The selection and granting of offshore petroleum titles is the responsibility of the Joint Authority which comprises the Commonwealth resources minister and the relevant state or territory minister. When a company is granted an offshore petroleum title then it is required to seek activity-specific approval from NOPSEMA to ensure it meets strict requirements for occupational health and safety, well integrity and environmental management.

2. How is NOPSEMA competent to make decisions for the community and the environment?

NOPSEMA employs experts across a wide range of technical fields including engineering, science and other maritime disciplines. Our environment specialists, for example, have significant formal qualifications in environmental science and related fields and generally 10–20 years' experience in environmental management roles with qualifications and experience in marine botany, ecotoxicology, marine ecology, environmental biology, environmental chemistry, marine birds, environmental economics, marine research, water quality, protected species conservation and recovery plans, environmental risk assessment, environmental management systems, and oil spill preparedness and response. NOPSEMA has dedicated Well Integrity and Spill Risk teams who focus solely on the prevention of well blow-out scenarios and maintaining close regulatory oversight of arrangements for oil spill preparedness and emergency response. Where needed, NOPSEMA also has access to external specialists, such as the Australian Antarctic Division's Marine Mammal Centre, for further technical knowledge.

3. Aren't all the 'technical specialists' at NOPSEMA just ex oil company employees with vested interests?

NOPSEMA recruits specialists from a range of backgrounds. Critical to our expertise are specialists with significant offshore oil and gas experience who have the technical knowledge to identify if activities are being managed appropriately. No single individual has control over the outcome of an assessment as each decision is formed as a result of a team-based assessment. All NOPSEMA employees must declare any potential conflicts of interests and abide by the Australian Public Service Code of Conduct. Some of NOPSEMA's specialists have previously worked for oil and gas companies in addition to government, consultancies, non-profit organisations, and service providers. All appointments to NOPSEMA are transparent and published in the Australian Government Gazette.

4. NOPSEMA is paid for by industry, so doesn't that mean that the oil industry can 'buy' their environmental approvals?

A company must pay a levy to NOPSEMA in order to make a submission to NOPSEMA for assessment. That levy is payable regardless of NOPSEMA's decision to accept or reject the submission. A key benefit of being a fully cost-recovered agency is that the cost of industry regulation is borne by the industry itself and not the Australian taxpayer. Furthermore, it ensures that NOPSEMA's funding and capacity is independent of government budget allocations and political influence.


Courtesy of Oil Spill Response Ltd.

Acceptability of proposed activities

5. Why are we still opening up new areas for oil drilling?

The selection of offshore areas made available for offshore petroleum activities is the responsibility of the Joint Authority which comprises the Commonwealth resources minister and the relevant state or territory minister. NOPSEMA does not have a role in selecting the offshore areas that are made available for offshore petroleum activity. When an offshore petroleum activity is proposed, it is NOPSEMA's role to ensure it is planned and undertaken in a way that minimises risks and impacts to people and the environment.

6. Oil exploration is a risk for the fishing industry. Why can't the GAB be left for the fishing industry?

The offshore petroleum and fishing industries have co-existed in Australian waters for more than 50 years. Petroleum activities commonly occur in, and adjacent to, fishing areas with many examples of the two industries operating compatibly in Australia and internationally. NOPSEMA's role is to ensure that the potential environmental risks of an offshore petroleum activity to other marine users, such as fisheries stakeholders, are reduced to as low as reasonably practicable while ensuring environmental impacts are of an acceptable level. This includes ensuring that fisheries stakeholders have been consulted and considered in the planning of a proposed activity to ensure all the potential risks and impacts to fisheries have been addressed. It should be noted, that NOPSEMA has no role in selecting the offshore areas that are made available for offshore petroleum activities, including if those areas are in close proximity to fisheries.

7. Why would NOPSEMA decide that an oil spill is 'acceptable'? If there is any chance of any oil spill from drilling, surely this is unacceptable?

A spill of any petroleum is not acceptable and the legislation expressly identifies the failure to prevent the waste or escape of petroleum as an offence. It is NOPSEMA's role to ensure that all practicable measures are in place to stop a well blow-out from occurring that could result in a major oil spill. In the unlikely event that a spill does occur, NOPSEMA also ensures that all relevant preparedness arrangements are in place to minimise impacts to the environment.

Offshore exploration drilling has been occurring in Australian waters since 1965. In 2017, there were 137 fixed facilities operating (including pipelines) and 919 offshore wells under NOPSEMA's regulatory oversight with no major oil spills occurring. Well blow-outs resulting in major oil spills are very infrequent events. In fact there has only been one well blow-out in more than 50 years of oil and gas operations in Australian waters that has resulted in a significant oil spill (Montara 2009).

NOPSEMA's technical specialists challenge each company proposing to undertake an offshore activity to demonstrate there is nothing more they can do to reduce the likelihood and/or environmental impact of a major oil spill or well blow-out to as low as reasonably practicable (ALARP). The decision as to what is ALARP is the view of NOPSEMA, based on a rigorous technical and scientific assessment, and this may not necessarily align with views of individuals in the community, the industry or government.

8. Won't NOPSEMA be pressured to accept drilling proposals in support the government's positions and energy policy?

NOPSEMA does not consider energy policies or political positions in its assessments or decisions. By law, NOPSEMA can only decide to accept or reject a proposed activity based on its merits in accordance with the law. Although NOPSEMA is accountable to the Australian Government, ministers have no capacity to direct or influence NOPSEMA on regulatory activities including its assessment decisions. The legislation also prohibits the minister responsible for NOPSEMA from directing NOPSEMA on operational matters.

Spill likelihood

9. How likely is an oil spill; isn't it a matter of 'when', not 'if'?

Oil spills from well blow-outs are very unlikely events. In fact there has only been one well-blowout in more than 50 years of oil and gas operations in Australian waters that has resulted in a significant oil spill (Montara 2009). Extensive technical planning and assessment goes into well design and drilling rig selection to ensure all available and practicable control measures are in place to reduce the likelihood of a well blow-out, and subsequent oil spill. However, because it is impossible to guarantee the likelihood of such an occurrence will be zero, the law also requires companies proposing offshore petroleum activities to prepare emergency plans and make advance preparations to ensure a rapid response to protect and evacuate workers and minimise and mitigate impacts to the environment.

10. We have extreme weather conditions in the GAB — how could they safety drill and then realistically respond to an incident in those conditions?

NOPSEMA will not approve a proposed activity unless the relevant approval documents have demonstrated how all risks and impacts will be reduced to ALARP in consideration of the conditions, water depth and remoteness of the proposed location. NOPSEMA's well integrity specialists ensure the design, construction and operation of a well(s) is suited to the specific conditions at the proposed location. Furthermore, drilling rigs are very large and capable of staying in position with great accuracy and NOPSEMA's technical safety specialists ensure the rig is able to safely operate at the proposed location. In addition, NOPSEMA requires companies to demonstrate appropriate contingency arrangements to regain control of the well and minimise environmental impacts if a well-blow out and/or oil spill were to occur.

Spill consequences

11. What is a capping stack and did it work in the Gulf of Mexico spill?

Capping stacks are very large, heavy valve systems that are lowered onto the subsea well to temporarily stop or redirect oil whilst action is taken to permanently control the well. If a well blow-out occurs, a capping stack is placed over the well to stop the flow of oil while a relief well(s) is drilled to permanently stop or 'kill' the well. Historically, a capping stack has only been used once, during the *Deepwater Horizon* blowout in the Gulf of Mexico in 2010. In this case, the capping stack was built at the time of the incident and stopped the flow of oil for many weeks before the well was killed. Since then, a range of state-of-the-art capping stacks have been constructed and located around the world for emergency deployment in case of a major oil spill. The use of a capping stack has become an accepted early response option in contingency plans for blowouts of deep water wells. Australia is fortunate to have several held nearby on standby in Singapore where necessary vessels capable of deployment are available. Air deployable options are also considered where they offer superior response timeframes**.**

12. We don't have the infrastructure or the people in this region to respond to a big spill. How could the company possibly respond to a spill in the GAB?

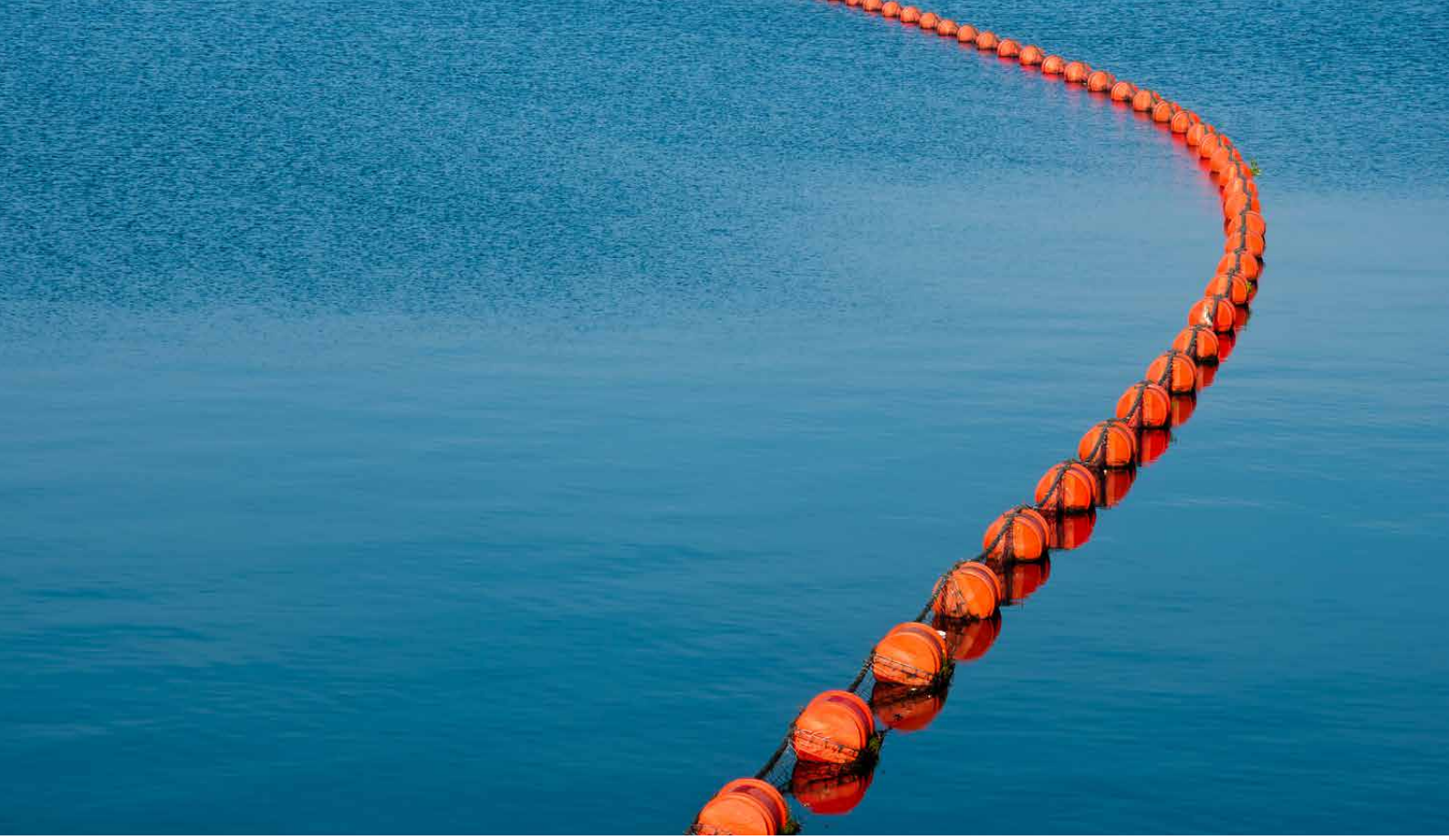
NOPSEMA will only allow a proposed activity to commence when suitable arrangements are demonstrated to be in place to ensure the necessary equipment and competent technical experts can be activated and deployed to respond to a major oil spill within appropriate timeframes. By law, offshore petroleum companies are required to develop oil pollution emergency plans (OPEP) that operate with the local, regional and national oil pollution plans and, where appropriate, also interface with international response plans and industry 'mutual-aid' plans. NOPSEMA's specialists ensure that a company's OPEP is realistic and appropriate for all worst-case spill scenarios.

13. Doesn't modelling show that oil will 'go everywhere' along the south coast from WA to Vic?

The stochastic oil spill modelling which many have become familiar with is not actually a map of one potential spill; it is a risk assessment tool used to study all the different places oil could theoretically go across multiple (often hundreds) spill scenarios under differing sea and weather conditions. Producing and interpreting oil spill models is a highly specialised task and the technical output images must be interpreted in the broader context and not as a stand-alone image. Model outputs could represent areas of thick surface oil or could represent non-visible concentrations of oil and each would require different planning and a different response. Stochastic oil spill modelling is done to ensure responders are prepared to respond to any and all credible spill scenarios.

14. How would I get compensated if a major oil spill ruins my business? What about my workers and their mortgages?

It must be remembered that well blow outs leading to major oil spills are very rare events. In the event that a significant spill did occur, anyone financially disadvantaged as a direct result of an oil spill is entitled to seek compensation from the responsible party directly or through civil proceedings via the courts. Australian law requires offshore petroleum companies to hold financial assurance that is sufficient to cover the reasonably quantifiable



costs and liabilities associated with oil spill response, clean-up, environmental remediation and ongoing monitoring. Financial compensation to businesses and their employees is not covered by the financial assurance requirements.

15. If NOPSEMA regulates activities in Commonwealth waters, how will our beaches and islands in state waters be protected?

NOPSEMA's assessment of environment and oil pollution emergency plans (OPEP) ensure consideration is given to all environmental and socio-economic values that may be impacted by a major oil spill irrespective of state boundaries. The OPEP is required to consider jurisdictional issues and ensure appropriate integration with state and territory response plans and responsible state and territory agencies to ensure values in each jurisdiction are protected. If areas, such as islands, are inaccessible or are otherwise not suitable for shoreline clean-up, then the OPEP must consider such limitations and propose alternative approaches.

Consultation processes

16. Is NOPSEMA requiring Equinor to release their environment plan for public comment?

Equinor has volunteered to publish their environment plan for public comment before formally submitting it to NOPSEMA for assessment. The Australian Government's Department of Industry, Innovation and Science is currently making changes to the Environment Regulations that will require publication of environment plans before they are submitted to and assessed by NOPSEMA. As these changes will not be in place until 2019, NOPSEMA cannot require Equinor to publish their environment plan. Equinor, however, has volunteered to meet this expectation ahead of this requirement being established and NOPSEMA has agreed to facilitate public comment given the level of public interest in the activity. For more information see the *Having your say about proposed offshore petroleum activities* on page 19.

17. How am I going to understand and comment on hundreds of pages in an environment plan in only a few weeks time?

Those wishing to provide comment on an environment plan should focus on the areas in the plan that are specific to their interests. Environment plans are technical documents and can be quite large, however, they are usually structured in a clear and logical order so that individuals will be able to easily find the areas of the plan that would be of interest. NOPSEMA suggests that comments on the environment plan should be specific and directed at matters relevant to the environmental management of the activity. NOPSEMA cannot take into account information that is irrelevant to the decision-making criteria as set out in the Environment Regulations.

18. I am just one person. How will my comments be weighted against bigger industries and associations?

If a comment raises a relevant consideration, then it must be addressed within the environment plan regardless of where it comes from and will be considered in decision-making by NOPSEMA. Conversely, if thousands of

individuals supply exactly the same comment, it will be regarded as one matter for consideration, and does not gain priority through repetition. As discussed above, information that is irrelevant to decision-making criteria cannot be considered, no matter whether it is raised once or thousands of times.

Roles of government in oil and gas in South Australia

Independent Commonwealth regulator

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

Australian Government

The Department of Industry, Innovation and Science (DIIS) has responsibility for the management and sustainable development of Australia's offshore resources and encouraging further investment in Australia's offshore resources sector. DIIS has oversight of policy and the regulations for the sector related to exploration, development and production, environment and safety, well integrity and legislative reviews.

The National Offshore Titles Administrator (NOPTA) is responsible for the day-to-day administration of petroleum and greenhouse gas titles in Commonwealth waters. NOPTA provides information and advice to the Joint Authority (JA) which is an arrangement between the Commonwealth and State/Territory Ministers for offshore petroleum decision-making processes.

The Director of National Parks (supported by Parks Australia) is responsible for managing 58 marine parks covering 2.8 million square kilometers of Commonwealth waters. Where oil operations are allowable, they are authorised under a class approval and must be undertaken in accordance with an Environment Plan accepted by NOPSEMA.

South Australian Government

The Department of Energy and Mining (DEM) has no day-to-day regulatory role but provides information and advice to the Joint Authority (JA) arrangement for offshore petroleum activities.

The Department of Environment and Water (DEW) has no direct role in the regulation of the offshore oil and gas industry in Commonwealth waters. DEW is a partner agency for oil pollution in South Australian marine waters, providing expertise in oiled wildlife response and advising of areas of conservation significance. DEW is responsible for the management of South Australia's marine parks, coastal parks, offshore island parks and the species and communities within them.

The Department of Planning, Transport and Infrastructure (DPTI) has no direct role in the regulation in offshore oil and gas. DPTI is the Control Agency for oil pollution in South Australian state waters. DPTI, through intergovernmental agreements, works closely with the Commonwealth agencies, the Australian Maritime Safety Authority (AMSA) and NOPSEMA, to ensure the National Plan to Combat Pollution of the Sea by Oil, addresses all risks to the State.

Further resources

Environment plan decision-making:
nopsema.gov.au/environmental-management/assessment-process/decision-making-guidelines

Environment plan assessment:
nopsema.gov.au/environmental-management/assessment-process/environment-plans

Management of oil pollution risks: nopsema.gov.au/environmental-management/oil-pollution-risks

Oil spill arrangements, strategies, modelling and dispersant factsheets:
nopsema.gov.au/resources/publications/#Factsheets

Management of well integrity: nopsema.gov.au/well-integrity

Cost recovery and levies: nopsema.gov.au/about/cost-recovery-and-levies

Australian National Plan for Maritime Environmental Emergencies: amsa.gov.au

Industry's approach to spill response: oilspillresponseproject.org

The need to act: improving relationships between seismic survey operators and the seafood industry

Currently, there are a number of companies proposing to undertake seismic surveys in Commonwealth waters off the south east coast of Australia in the coming two years. Poor communication and misunderstandings about these surveys has attracted community, media and government interest and contributed to heightened tensions, particularly for fisheries stakeholders and the communities in which they operate.

It is important to note that an oil and gas company typically needs only one company to acquire the available seismic data in their title area. Multiple seismic companies, however, may wish to secure this work and as such will prepare an environment plan, consult with relevant persons, and submit that environment plan for assessment to NOPSEMA. This may appear as if multiple companies, upon acceptance of their environment plan, will undertake seismic surveys over the same area at the same time but only one company is typically awarded the work and proceeds with the one survey.

A fundamental requirement for the acceptance of an environment plan is that it demonstrates how an activity will be undertaken while reducing environmental risks to as low a reasonably practicable (ALARP) and ensuring environmental impacts are of an acceptable level. Environment plans proposing seismic surveys must factor in the contributing risks and cumulative impacts from the other surveys including those that have recently occurred and those proposed and publicly known.

Another fundamental requirement for the acceptance of an environment plan is that appropriate and ongoing consultation is undertaken with relevant persons whom may be affected by the proposed activity. For many seismic surveys this includes consultation with fisheries stakeholders. It is NOPSEMA's observation that the many differences between offshore petroleum industry and fisheries stakeholders are reducing the efficiency and effectiveness of this consultation. A key point of contention often appears to be the interpretation and application of relevant science on the environmental impact of seismic surveys on commercially-important marine species.

Recognising the complexities of sharing marine resources between two very different industries, NOPSEMA has been encouraging the offshore petroleum industry and fisheries stakeholders to resolve their differences in support of each other's operations. In response to this and to assist in achieving this outcome, NOPSEMA is pleased to see progress in establishing a series of ongoing round table meetings to be held between APPEA, Seafood Industry Australia (SIA), other commercial fishing bodies and involving NOPSEMA and other state and Commonwealth government agencies and representatives from the offshore petroleum and fisheries industries. The objective of the meetings, a spin off from the national MOU roundtable re-established between seafood and petroleum industries, will be for participants to discuss their respective issues, recognise conflicting expectations, and ideally agree to actions going forward including collaborating on an agreed position on available research.

NOPSEMA remains committed to fostering improved relationships between the offshore petroleum industry and fisheries stakeholders and will continue to progress initiatives that promote the sharing of perspectives, concerns, information and available research.

Ensuring consistent consultation with relevant persons

In recognition of the strong feedback received from its Community and Environment Reference Group and stakeholders whom are routinely consulted as relevant persons, NOPSEMA has commenced working on a prescriptive, mandated relevant persons consultation process to be used during the preparation of an environment plan. For more information on this work contact environment@nopsema.gov.au.

Exposure to H2S — Are you prepared?

Hydrogen sulphide (H2S), is a toxic, corrosive and flammable gas occurring naturally in hydrocarbons. Detection of this gas on an offshore facility, if not responded to and controlled immediately, can result in injuries, fatalities and has the potential to cause an explosion.

As an oil field matures there is a higher probability of encountering H2S at toxic levels, however, H2S can also be found unexpectedly during routine exploration and production drilling activities. For example, H2S can be produced by bacteria found in stagnant drilling fluid of a temporarily abandoned well and can be created when hydrochloric acid (used to stimulate production of a well) reacts with iron sulphide present in the well bore or processing equipment.

A recent incident identified that sewage overflow contained in a vessel bilge tank created unsafe levels of H2S, which required the emergency response plan for H2S exposure to be activated at the facility. For more information about appropriate exposure standards see *The National Exposure Standards for Atmospheric Contaminants* published by the National Occupational Health and Safety Commission [NOHSC:1003(1995)]. These standards have been adopted in Australia and are referred to in the Safety Regulations.

H2S is also flammable, but generally this is a secondary consideration to occupational exposure. By the time the level of H2S has risen to a level that could cause ignition, the toxicity level for instant death would have long been exceeded. It is therefore vital operators have appropriate safety management systems and H2S contingency plans in place to ensure the safety of personnel at or near a facility.

An example of a safety management system includes a fixed point system which is designed to act as a first line barrier against H2S exposure by detecting and monitoring the presence of H2S. When designing a fixed point detection system, operators should take into account the design of the facility, environmental conditions in which the facility operates and available technologies. Another common practice includes using portable/personal devices to detect the presence of H2S as wind can often cause H2S to be dispersed away from fixed point detectors. The offshore marine environment is harsh and unforgiving and this, combined with the highly corrosive properties of H2S, can take its toll on sensitive instruments. A robust maintenance regime is therefore key to ensuring the detection systems operate on demand.

If H2S is detected, the emergency response plan for toxic hazards must be implemented. It is important that training drills and exercises are routinely conducted to test the plan and ensure personnel are familiar with safety procedures and equipment including the use of breathing apparatus if required.

In summary, well-designed detection and alarm systems, good maintenance practices, adequately trained personnel, and being cognisant of the dangers of H2S are all essential components to ensure H2S safety offshore.

Preventing the recurrence of water jetting incidents

Diving contractors often use high pressure water jets to clean and remove biofouling from subsea structures including vessel hulls, rudders, propellers, pipes, mooring devices and anchor wells for the purposes of inspection, routine maintenance and construction works. This type of activity can pose a number of risks to the health and safety of divers and despite efforts by NOPSEMA and the International Marine Contractors Association (IMCA) to raise awareness and share lessons learned from past incidents, it appears divers are continuing to sustain injuries.

On 20 July 2018, IMCA published a safety flash (IMCA Alert ID 1402) alerting industry of an incident where a diver sustained a serious injury to their arm when the water jet gun failed and a part of the gun came off. This incident followed similar high pressure water jetting incidents occurring on 3 May 2017 (IMCA Alert ID 1184), 3 March 2015 (IMCA Alert ID 887), 19 July 2011 (IMCA Safety Alert 573) and 30 March 2011 (NOPSA Safety Alert 46); which resulted in the successful prosecution of both the diving contractor and the manufacturer of the diving equipment. The common causes of these incidents was inadequate design and construction, deficient maintenance, and failure to train all members of the diving project on the operational requirements and risks of high pressure equipment.

Injuries caused by high pressure water jets are typically very serious with a high risk of infection due to injection of debris and other water-borne contaminants. This is of particular concern for saturation divers who will have to complete lengthy decompression before they have full access to medical intervention. This is one of the reasons it is so imperative for diving contractors and facility operators to ensure appropriate control measures are in place to prevent water jetting incidents. Commonly adopted control measures include ensuring equipment is fit-for-purpose, well maintained and regularly tested and ensuring personnel using water jetting equipment are trained and competent.

Water jetting incidents are not new and it is NOPSEMA's expectation that all parties involved in these incidents are learning from them to prevent a recurrence. Diving contractors and facility operators must ensure all control measures for the prevention of injury from high pressure water jetting are in place, and that all members of the diving project (including divers, supervisors and managers) are aware of the risks associated with the use of high pressure water jetting equipment and are competent in the operational requirements of the equipment.

Improving environmental impact assessments for seismic surveys

NOPSEMA has identified a range of common deficiencies in environment plans in relation to the environmental impact assessment (EIA) process for acoustic emissions from seismic surveys. These deficiencies often contribute to prolonged assessment timeframes, reduced operational flexibility and have presented challenges to industry's social license to operate.

To assist industry and promote continuous improvement, NOPSEMA has developed an *Acoustic impact evaluation and management* information paper. The information paper is intended to provide good practice advice for the assessment and management of environmental impacts of acoustic emissions from seismic surveys.

The paper identifies a number of common deficiencies throughout the EIA process and provides advice in the form of 'considerations' to assist industry in addressing those deficiencies. Advice is also provided on the selection of suitable approaches for predicting underwater sound levels and determining where specific measures are required to validate sound levels, as well as fauna abundance and/or impact predictions to inform adaptive management.

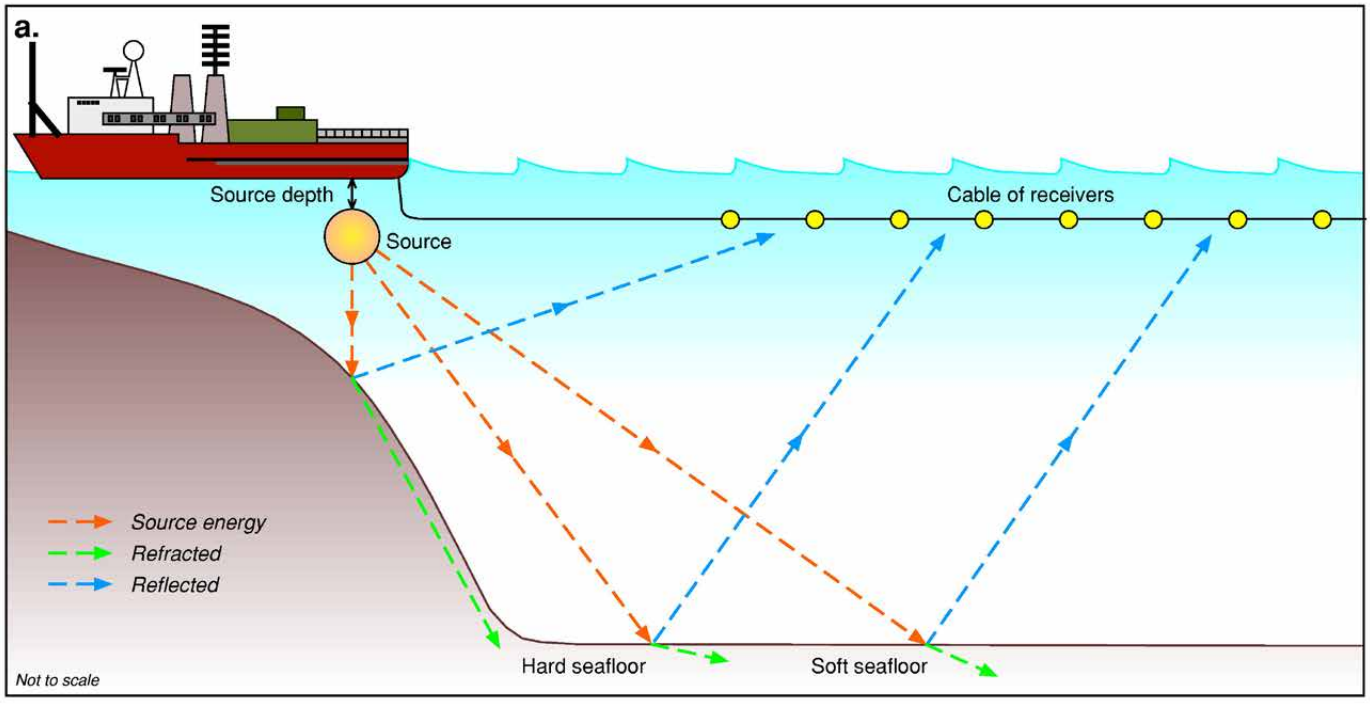
The paper does not prescribe how environmental impacts of acoustic emissions from seismic surveys must be managed. Rather, it provides good practice advice to assist industry in ensuring their EIA process incorporates and considers relevant information when making predictions and selecting approaches for managing environmental impacts.

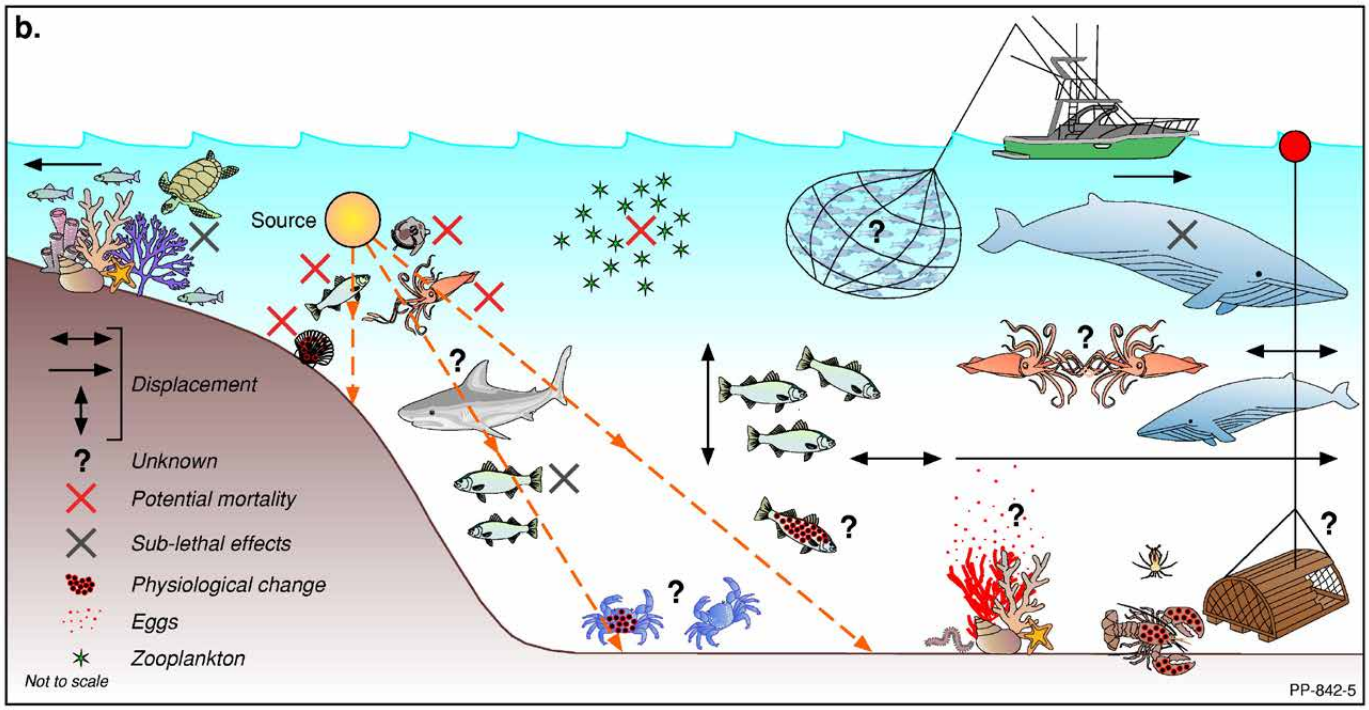
It is NOPSEMA's expectation that industry considers the advice provided in the information paper during the preparation of environment plans proposing seismic surveys. While it is not a regulatory requirement to apply the advice provided, consideration by industry is likely to result in improvements in the quality of demonstrating environment plans meet the requirements of the regulations as well as NOPSEMA's assessment policies and decision making guidelines.

NOPSEMA will undertake a review of the information paper in 12 months to ensure it continues to assist industry in preparing quality EIAs for seismic surveys.

To access the new guidance visit nopsema.gov.au/environmental-management/environment-resources.

Courtesy of Geoscience Australia and adapted from Carroll et al., 2017





New publication requirements for environment plans — referring to information already provided

The Department of Industry, Innovation and Science (DIIS) is currently coordinating amendments to the Environment Regulations to provide greater transparency in the offshore petroleum environmental management approval process. These amendments will soon be finalised and see environment plans published in full on NOPSEMA's website in 2019. The amendments, currently out for public comment, are expected to change the way information can be presented in an environment plan to ensure the community has access to all relevant information.

The existing regulations currently allow titleholders to refer to information previously provided to NOPSEMA to avoid duplicating information in each environment plan submission. This includes referring to documents already submitted to NOPSEMA such as oil pollution emergency plans, or descriptions of environmental management measures in other environment plans. This practice is not likely to provide the required transparency for readers going forward and the regulations may be changed to instruct titleholders to only include publicly-available information in their environment plan and to provide a link or reference for readers to refer to. Other subtle changes to the content of an environment plan may be required to enable the document to 'stand-alone' when it is published. For example ensuring sufficient descriptions of the features of control measures and their associated environmental performance standards, rather than naming only the internal company document title which does not indicate the nature of the control.

Titleholders need to be aware that the regulations are expected to require NOPSEMA to publish environment plans in full on NOPSEMA's website, with the exception of full copies of correspondence from consultation with relevant persons and redaction of any personal information from the environment plan not expressly required to be included. Full text correspondence with relevant persons will not be published so that the privacy and commercial interests of participants involved in consultation are maintained, but will still need to be submitted to NOPSEMA for assessment with the environment plan.

To stay updated on the regulatory change process and amendments visit DIIS's website at industry.gov.au.

Having your say about proposed offshore petroleum activities

The Department of Industry, Innovation and Science continues to progress work to implement policy changes announced by the Minster for Resources and Northern Australia to publish environment plans and include a period of public comment on environment plans proposing exploration activities.

Although these changes are not expected to come into effect in 2018, NOPSEMA recognises there is significant community interest in relation to the environmental management of offshore petroleum activities, in particular proposed exploration drilling in the Great Australian Bight. In anticipation of these changes, NOPSEMA has been advised by Equinor (formerly Statoil) of its intent to voluntarily publish its environment plan for proposed exploration drilling in the Great Australian Bight.

NOPSEMA has agreed to a request from Equinor to facilitate a period of public comment for the environment plan before it is submitted for assessment. What this means is that NOPSEMA will publish on its website a link to Equinor's environment plan, summary information and an online submission form for interested stakeholders to provide their comment. NOPSEMA's facilitation of this process will ensure public comments are received by the regulator as well as proponent.

NOPSEMA remains a strong advocate for greater transparency in the environmental management of offshore petroleum activities and welcomes Equinor's decision to publish their environment plan for public comment ahead of the requirement to do so.

To stay up-to-date with the latest news, interested stakeholders are encouraged to visit nopsema.gov.au/subscribe to subscribe to environmental management news.

Opportunities to contribute to future regulatory reform

NOPSEMA encourages stakeholders to have their say and contribute to future legislative and regulatory reform regarding decommissioning and environmental consultation and transparency.

Opportunity to discuss the future regulatory and legislative framework for decommissioning

The Department of Industry, Innovation and Science (the Department) has commenced a review of the regulatory and legislative framework for decommissioning offshore petroleum infrastructure in Commonwealth waters. A series of discussion forums in Perth (30, 31 Oct) and Melbourne (2 Nov) will be held providing stakeholders with an opportunity to input into the future policy, regulatory and legislative framework for decommissioning.

As part of the review, the Department has also published a discussion paper that outlines proposed options for enhancing the existing decommissioning framework. Interested stakeholders are invited to provide comment on the paper by 16 January 2019. Visit industry.gov.au for more information or to register attendance.

Opportunity to provide feedback on proposed consultation and transparency reform

The Department has released draft amendments to the Offshore Petroleum and Greenhouse Gas Storage (Environment Regulations) 2009 to improve the consultation and transparency requirements for offshore oil and gas activities in Commonwealth waters. The Department invites interested stakeholders to provide feedback on the draft regulations by no later than 16 November 2018.

Stakeholders are also invited to attend one of the public consultation forums in Perth (30, 31 Oct), Adelaide (1 Nov) or Melbourne (2 Nov). The forums will provide stakeholders with an opportunity to discuss the proposed reforms in greater detail. To provide comment on the draft regulations or to register your interest in attending a consultation forum visit industry.gov.au.

Industry acts to address tolerance of dynamic positioning systems to human error

Since 2016, NOPSEMA has been raising concerns with the offshore petroleum industry about the susceptibility of dynamic positioning (DP) system controls to human error. This concern originated from an incident in Commonwealth waters where a vessel unintentionally drifted off location when the DP system was inadvertently deactivated. Although no one was injured, the lives of divers working on the seabed nearby were put at risk.

Communications with DP manufacturers and industry bodies indicated that measures to improve the error tolerance of DP systems are available but may not be widely known or implemented. While inadvertent deactivation of DP controls across the marine industry are reportedly becoming less frequent, a report of station-keeping events published by the International Marine Contractors Association has noted two loss of position events due to inadvertent deactivation of DP controls in the first half of 2018. This suggests that the implementation of additional control measures is necessary to reduce risk to a level that is as low as reasonably practicable (ALARP).

Consequently, NOPSEMA has undertaken a work program to identify the steps operators in Australia have taken to improve the error tolerance of their DP systems. Information received from 27 DP facilities indicates that 96% rely on double-press functionality as a means of protecting against unintentional deactivation of three-axis control. The majority of facilities had taken additional steps to protect against unintentional deactivation. These are summarised in Figure 1: Means of protecting against unintentional deactivation.

Facilities also reported improvements in the layout of keyboards to reduce opportunities for inadvertent deactivation, the use of clean desk policies, and installation of tables fitted to DP Officers chairs to provide space for items such as logbooks, cups and pens. Some facilities reported the use of trace lines during DP operations to indicate inadvertent vessel drift and the use of procedural controls, such as standing orders and case study discussions, to maintain awareness of the risks.

NOPSEMA also asked DP facility operators if they were aware of a number of bulletins and alerts published addressing the potential for inadvertent mode changes during DP system operation. Responses to this question are summarised in Table 1 — Facilities aware of DP systems error risk publications.

The information NOPSEMA has received from DP facility operators suggests that the majority of DP facilities operating in the Australian offshore petroleum industry are taking appropriate steps to ensure their DP systems are error tolerant, and that the risk of inadvertent mode deactivation is reduced to ALARP. Where there is evidence of a gap between risk reduction methods that are available and those that are implemented, NOPSEMA will conduct inspections to ensure that all reasonably practicable measures are implemented to reduce the risk of inadvertent mode deactivation to ALARP.

Figure 1: Means of protecting against unintentional deactivation

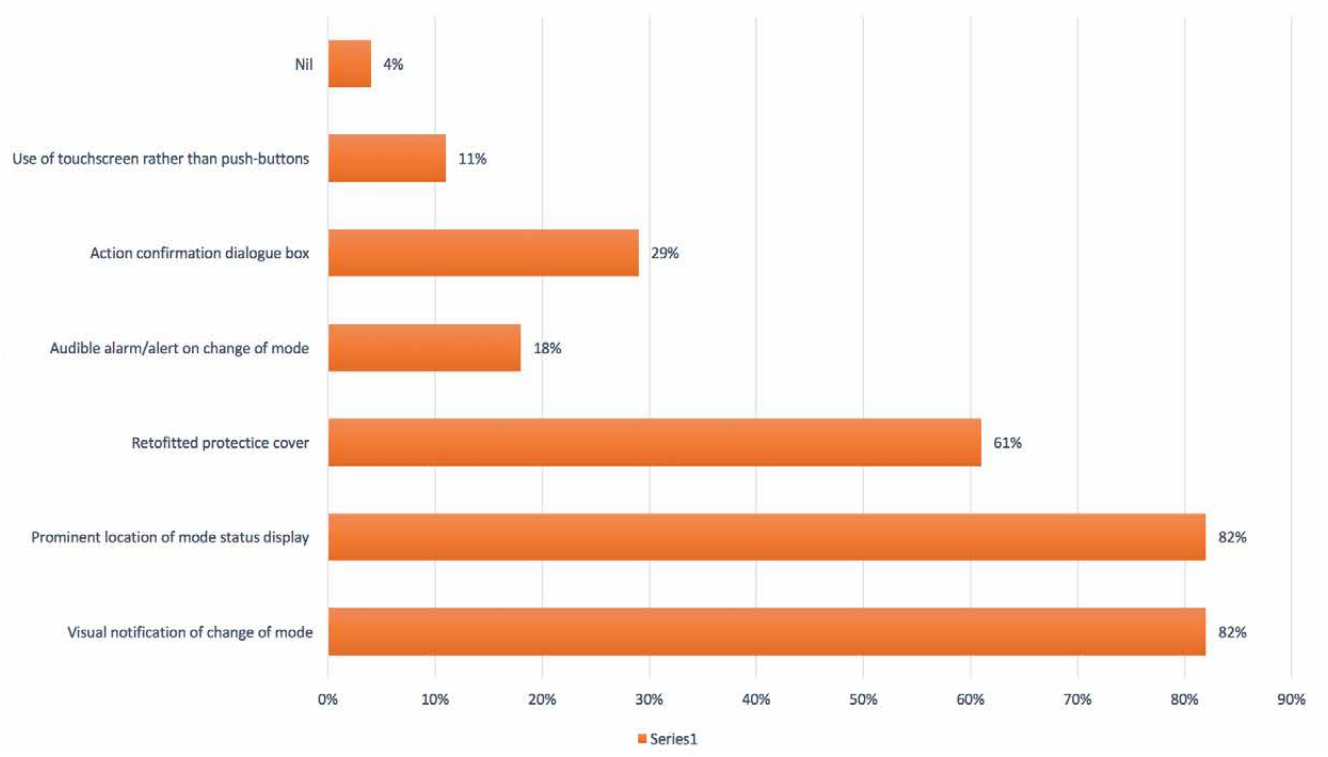


Table 1 — Facilities aware of DP systems error risk publications

Publication	Awareness
Kongsberg, *Information Letter DP01-2018*, March 2018	50%
International Marine Contractors Association, *DP Station Keeping Event Bulletin*, February 2018	100%
Marine Technology Society, *Classic DP Incident*, April 2018	61%
NOPSEMA, *Safety Alert 62 — Vessel loss of position while diving in close proximity to a hydrocarbon facility*, June 2016	96%

NOPSEMA's expectations of industry to improve oil spill response

Offshore petroleum exploration and production operations often consist of inherently high-risk activities with potentially catastrophic consequences for the workforce and environment in the very unlikely event of a loss of containment incident. It is therefore imperative that the regulatory regime requires that activities are appropriately managed to reduce risks to the health and safety of the workforce and environment to as low as reasonably practicable (ALARP).

To demonstrate that an activity's risks to the environment will be reduced to ALARP, a titleholder must provide reasoned and supported arguments in their environment plan that shows no other practical measures could reasonably be taken to reduce the activity's environmental risks unless they entail a grossly disproportionate impost in comparison to the reduction in risk. It is NOPSEMA's view, based on observations during plan assessments, petroleum environment inspections and ongoing monitoring of changes in technology and innovation, that many titleholders can improve their oil spill response arrangements and/or strengthen their ALARP position.

When it comes to oil spill response, titleholders should focus firstly on stopping the flow of the oil (e.g. killing the well), while controlling the source of the spill (e.g. capping and/or containment of the well), before recovering and/or treating the oil (e.g. using dispersant). This prioritisation is supported by the fact that beyond stopping the flow of oil, the greatest environmental benefit from response actions is achieved through the direct recovery and treatment of the spilled oil at its source.

Historical oil spills provide some information on the prioritisation of different response actions and their varying contribution to reducing environmental impacts. Information from the *Deepwater Horizon* blowout shows the contribution of response actions to minimise consequences of escaping oil decreased the further away those actions got from the source of the spill, for example, direct oil recovery from the wellhead accounted for 17% of spilled oil, chemical dispersion 16%, burning 5% and skimming 3%.

Mitigation measures further from the source of the oil spill cannot, of course, be ignored. While these measures (e.g. shoreline clean-up) are often more remedial in nature they can serve to reasonably reduce the extent and duration of an oil spill's environmental consequences. Measures must be taken, where feasible, to prevent sensitive receptors (e.g. marine parks and wildlife) from being affected from an oil spill. These situations are often in state waters and as such titleholders should ensure their arrangements can be implemented in partnership with the relevant state authorities.

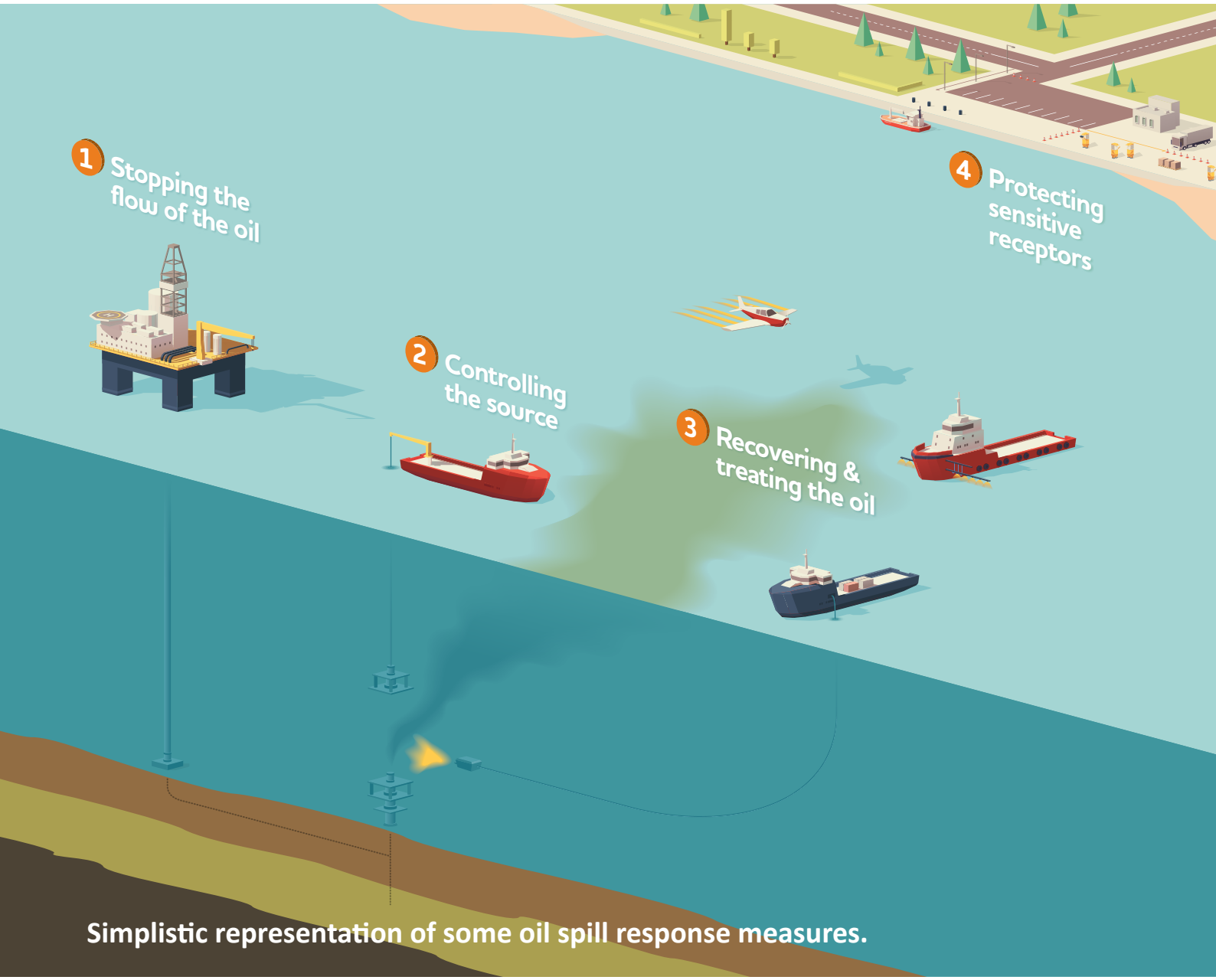
Continual improvement is central tenet of the objective-based offshore petroleum regulatory regime. This means that titleholders are required to regularly examine their arrangements to identify and implement possible improvements, such as the adoption of emerging technologies and/or meeting the increasing expectations of the community. From its unique position as regulator, it is evident to NOPSEMA that while small improvements are possible at a titleholder-by-titleholder level, substantive improvement requires industry-wide or collective action.

Given the rarity, but potential catastrophic consequences, of a major oil spill, it is NOPSEMA's view that industry should seek to adopt more cooperative arrangements for oil spill response. NOPSEMA sees no significant legislative barriers prohibiting such arrangements provided legislative duties (e.g. financial assurance or 'polluter pays') are met. In fact, NOPSEMA recognises that such arrangements may allow improved mitigation measures to be adopted that would otherwise be out of reach for a single titleholder.

Over the medium to longer term, NOPSEMA expects titleholders to evaluate additional, alternate and improved cooperative oil spill response arrangements to further reduce environmental risks and strengthen their ALARP position. It is important that this evaluation reflects the environmental benefits of such arrangements (e.g. mitigating environmental consequences) and fairly represents the impost (cost among other factors) associated with the approach of sharing the arrangements across multiple activities and titleholders. Since 2017, NOPSEMA has been working with titleholders through its Spill Risk Cooperative Forum to assist understanding and promote awareness of continual improvement opportunities in oil spill response. Oil spill focal points within titleholder companies are encouraged to contact NOPSEMA at environment@nopsema.gov.au for more information.

The timeliness of a titleholder's response is critical as even small reductions in the commencement of response strategies can prevent the discharge or recovery of thousands of cubic metres of oil. At times, titleholders downplay the significance of small improvements in timeliness by referring to the total volume of spilled oil. NOPSEMA discourages this approach as even a small amount of spilled oil is of great concern to the regulator and the Australian community. The adoption of enhanced cooperative oil spill response arrangements offers increased scope to improve the timeliness of response actions through improved access to and mobilisation of equipment and resources.

Regardless of the approach the industry chooses to adopt to achieve continual improvement in oil spill response, it is imperative that the decisions made are evidence-based so they may stand up to regulatory scrutiny and address community expectations. Titleholders are strongly discouraged from trying to find new ways to justify their existing capability in their ALARP demonstrations. Rather, it is more productive and reflective of a responsible industry, to objectively examine their arguments to demonstrate ALARP alongside the oil spill arrangements that are already in place to ensure their capability to respond to a major oil spill appropriately matches to the identified environmental risks and impacts. Titleholders may wish to refer to NOPSEMA's Oil pollution risk management guidance note for more information on good practice approaches to spill risk evaluation, response planning and preparedness. To read the guidance note visit nopsema.gov.au/environmental-management/oil-pollution-risks.



Simplistic representation of some oil spill response measures.

Find one fix many: Offshore potable (drinking) water systems

Since 2011, NOPSEMA inspections have found many operators have implemented comprehensive systems for the management of potable (drinking) water and are continuing to improve these systems. However, over the same period, nine different operators (across 12 facilities) were issued 19 recommendations in relation to deficiencies in the provision of potable water systems.

Seven of the recommendations issued originated from a lack of internal cleaning of water tanks for long periods (i.e. years). The remainder related to taking action to address discoloration of water, insufficient free chlorine in the water, lack of periodic water quality testing, lack of preventative maintenance (water filter change out, UV light disinfection) and lack of auditing of the potable water management system for performance standards assurance.

In considering the above findings, NOPSEMA reminds operators that the principal risk to human health from potable water is the presence of pathogenic microorganisms (i.e. bacteria) which can result in water-borne disease (i.e. diarrhoea, gastrointestinal illness, legionellosis). Water-borne disease can be spread while bathing, washing or drinking water, or by eating food exposed to infected water. The illnesses associated with water-borne disease may have a significant impact on an operator's ability to safely operate an offshore facility.

Operators are reminded that Clause 9 of Schedule 3 of the OPGGS Act places a duty on all operators to take all reasonably practicable steps to ensure that the facility is safe and without risk to the health of any person at or near the facility. Operators should be using multiple barriers to prevent the entry and transmission of pathogenic microorganisms in potable water systems, such as:

- regular cleaning of the potable water tanks
- regular inspection of the potable water system to check for any sources of contamination
- the use of a clean, unpolluted water source.

Additional information on cleaning potable water tanks can be found in the *IMCA Safety Flash 1313 at* imca-int.com/alert. This alert describes two cases of contaminated water from a failure to inspect and maintain fresh water tanks. NOPSEMA has also published two articles on the topic of portable water including *New Australian drinking water guidelines released* (the Regulator: Issue #1 – 2012) which discusses a framework for good management of small water supplies to ensure water is safe to drink and and *Quality of drinking water* (the Regulator: Issue #6 – 2014). Each article can be accessed at nopsema.gov.au/resources/publications.

Source control workshop and Spillcon 2019: Participation opportunities

The leading Asia-Pacific international oil spill conference and exhibition, Spillcon, will take place in Perth, Western Australia from 20-24 May 2019. Alongside the International Oil Spill Conference (IOSC) in the United States, and Interspill in Europe, Spillcon is one of the three main global meeting points for industry, government, and non-governmental organisations working in the fields of oil spill preparedness and response.

Many readers may recall that within the context of Spillcon 2016, NOPSEMA worked as part of the International Offshore Petroleum Environment Regulators (IOPER) group with the Australian Petroleum Production and Exploration Association (APPEA) to organise and host a joint regulator/industry workshop on the oil spill preparedness topic of 'How Much is Enough?'. The technical half-day workshop gave more than 50 industry and government stakeholders working in oil spill preparedness and response an opportunity to discuss national and international perspectives on how much preparedness and response is appropriate in the context of oil spill risks from offshore oil and gas.

Based on the success of that event, NOPSEMA is now looking forward to an opportunity to deepen the discussion, this time with a particular focus on new technologies and best practice in response and preparedness for loss of well control risks. Accordingly, NOPSEMA is currently seeking expressions of interest for all levels of participation in sponsoring, organising and/or attending a one-day joint industry/regulator Source Control Workshop held within the context of Spillcon 2019.

This workshop will be a great opportunity for interested service providers and equipment manufacturers to present technical detail on their capabilities, for industry stakeholders to deepen their understanding of current state-of-the-art technologies, and for regulators and others to critically discuss and evaluate the relevance of existing technologies and arrangements. NOPSEMA is intending to create a highly interactive and stimulating event.

If you are interested in sponsoring, assisting in the organisation or participating in this event please contact communications@nopsema.gov.au for more information.

Sharing knowledge about the marine environment

The ability to share, compare and apply knowledge about the marine environment from a variety of information and data sources can improve environmental management outcomes as well as reduce the cost of doing business. While the offshore petroleum industry routinely collects such data to satisfy common information needs, the methods used to collect the data often vary.

Inconsistency in the design and implementation of marine environmental surveys and monitoring programs can have a considerable impact on the ability to apply that information to a specific environmental management issue. For example, it is often challenging, and in some cases impossible, to use information compiled from studies that use different methods to support an environmental impact assessment or verify that environmental impacts have not exceeded an acceptable level.

Through assessing environment plans, NOPSEMA scrutinises attempts by titleholders to compare information collected using different methods. This is because, in some cases, it can be like trying to compare 'apples and oranges'. To support their environmental impact assessment, titleholders may need to carry out supplementary or different studies, and incur additional costs which could have been otherwise avoided if a standardised approach had been applied at the outset.

Recognising the potentially far-reaching benefits of nationally-consistent marine environmental study methods, titleholders should be aware that researchers from the National Environmental Science Program Marine Biodiversity Hub (the Hub) project have developed *Field Manuals for Marine Sampling to Monitor Australian Waters*. These manuals cover survey design, planning and reporting, quality control, data management, discoverability and accessibility, and standardised methods to acquire data using:

- multibeam echosounder
- autonomous underwater vehicles
- benthic and pelagic baited remote underwater video systems
- towed imagery
- grabs and corers
- sleds and trawls.

Given the potential for improved environmental management outcomes and productivity gains associated with using standard methods for the collection of environmental data, NOPSEMA encourages titleholders to read and test applicability of the field manuals when planning relevant marine environmental studies. The Hub welcomes feedback on this initiative. If titleholders are interested in providing feedback, they can do so by completing a survey at surveymonkey.com/r/NZRLMHB.

Titleholders are also encouraged to explore collaboration opportunities with the Hub to provide input into the potential development of new manuals or the publication of existing standard operating procedures for additional methods. If titleholders would like to get in touch with the Hub to find out more about these opportunities they are able to so by emailing Rachel Prezlawski at Geoscience Australia (rachel.przeslawski@ga.gov.au).

For more information about the field manuals visit: nespmarine.edu.au.

NOPSEMA's inspection priorities

NOPSEMA's vision of a safe and environmentally responsible Australian offshore petroleum and greenhouse gas storage industry is based upon ensuring that industry has a high probability of preventing and/or effectively responding to major accident and loss of containment events including source control and oil spills. To assist the industry in achieving this, NOPSEMA's inspection priorities for 2018–19 include:

PREVENTING major accident and loss of containment events

- Aging facilities and assets — maintenance and end-of life concerns
- Third party equipment and services — diving equipment and helicopter operations
- Safe isolation of plant and equipment
- Loss of station keeping (mooring and dynamic positioning) for mobile offshore drilling units, floating production storage and offtake facilities and vessel facilities

PREVENTING AND MANAGING a loss of well control

- Assets and aging facilities — well barriers and aging wells
- Third party equipment and services — well testing equipment
- Blow out preventer systems (API Standard 53) for mobile offshore drilling units new to the regulatory regime

IMPROVING effective incident response and spill source control

- Incident investigation and auditing

IMPROVING oil spill preparedness arrangements

- Effective preparedness to respond to oil spills — arrangements for timely source control; dispersant selection, supply, application and monitoring; exercise and testing

OTHER

- Invasive marine species
- Simultaneous operations (SIMOPS) for new, large facilities

Incident investigation and auditing

NOPSEMA has identified dutyholder incident investigation and auditing as an area of focus as a result of an identified trend in the poor quality of investigation reports and deficiencies in auditing. For example, many investigation reports received by NOPSEMA do not include adequate root cause analysis; reflecting only the immediate cause of the incident rather than its root cause e.g. degraded/damaged valve. Further to this, many actions to prevent the recurrence of an incident do not adequately address the root cause(s) and, as a consequence, there have been a number of repeated failures. It is imperative dutyholders ensure their investigation processes minimise the chance of a recurrence. Good investigation will generally include: following a clear internal investigation policy and procedure, setting clear terms of reference for the investigation, having an appropriate investigation team (with sufficient independence to avoid conflict of interest and bias), undertaking a thorough incident analysis and clearly identifying root causes and actions which will adequately address those root causes. Further to this, dutyholders should have adequate auditing and review systems in place, and should not rely on NOPSEMA's inspections to identify deficiencies.

Oil spill preparedness and response

Preparedness arrangements and capability to respond effectively to an oil spill continues to be an area of focus for NOPSEMA. Specifically, the prioritisation of arrangements with the greatest potential reduction of consequence. NOPSEMA will also continue to focus its attention on the exercise and testing of response arrangements to ensure the capability for an effective and timely response is maintained. This is particularly important given the rarity of major oil spill incidents and the fact that these arrangements are not regularly in action and could easily lose effectiveness over time if not regulatory exercised. For more information see the *NOPSEMA's expectations of industry to improve oil spill response* article on page 22.

Workplace arrangements: What is required of operators and employers?

Members of the workforce play an important role in ensuring occupational health and safety (OHS) on offshore petroleum facilities. The OPGGS Act sets out broad consultative provisions requiring operators and employers to consult with members of their workforce. These provisions include developing an OHS policy, establishing designated work groups, establishing a health and safety committee and electing health and safety representatives (HSRs).

Occupational health and safety policy

Facility operators are required to develop an OHS policy in consultation with members of their workforce. Operators must promote the policy and provide the workforce with an opportunity to review policy measures to ensure OHS. The policy must include an agreement made between the operator and the workforce on how ongoing consultation will occur.

Designated work group

Facility operators are required to establish a designated working group (DWG) when it is requested by a member of the workforce or a workforce representative. Within 14 days of such a request the operator must undertake consultation with the member of the workforce or the workforce representative as well as each employer (if any) of members of the workforce. Within 14 days of completing that consultation, the operator must establish the DWG.

Health and safety representatives

HSRs may be selected by unanimous agreement or an election process. Operators must ensure an up-to-date list of all HSRs is made available to the workforce on the facility. HSRs must be permitted to take time off work as soon as practicable to attend a NOPSEMA-accredited HSR training and must be provided with the necessary facilities to exercise their powers such as the use of a private office, a computer with an internet connection and access to relevant safety documents (e.g. the facility's safety case, policies, procedures).

Health and safety committees

Facility operators are required to establish a health and safety committee when it is requested by a HSR on a facility comprising more than 50 members of the workforce where one or more DWGs have been established. Operators may also establish a health and safety committee voluntarily. The committee's constitution must be agreed between the operator and members of the workforce and members must be allowed time to exercise committee functions and be provided with information relating to workforce health and safety risks.

For more information on workplace arrangements see NOPSEMA's draft Workplace arrangements guidance note (GN1783) at nopsema.gov.au. The guidance note seeks to assist facility operators and employers in meeting their legislative obligations and inform members of the workforce on how to initiate and engage in workplace arrangements. The guidance note is open for public comment for a period of eight weeks. All comments, with or without a marked-up copy of the document, should be emailed to safetycaseguidance@nopsema.gov.au no later than COB Monday, 19 November 2018.

Managing biosecurity risks

In accordance with Australian Government requirements, companies conducting oil and gas activities in Commonwealth waters have a responsibility to manage biosecurity risks to protect Australia's marine ecosystems and marine-based industries from the introduction and establishment of invasive marine species (IMS).

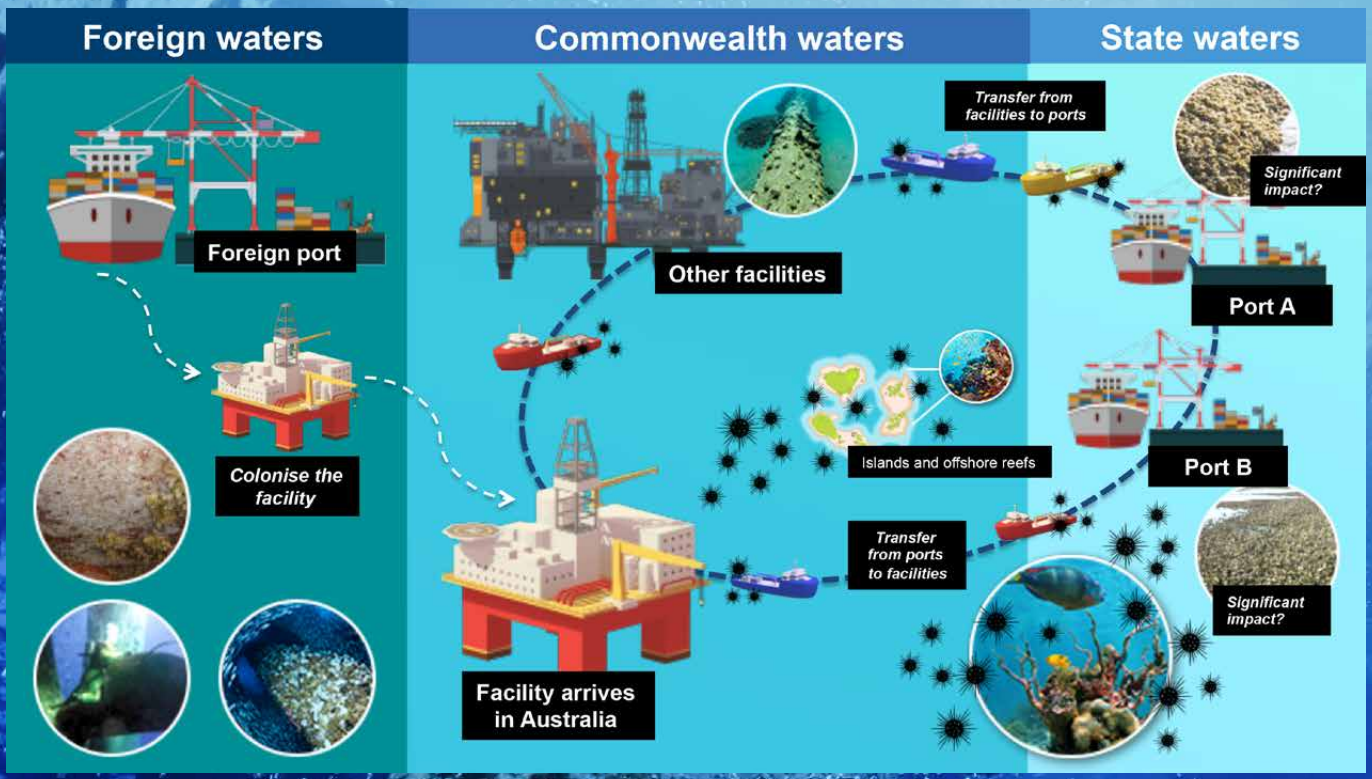
Offshore petroleum facilities are regularly built and maintained in overseas ports, and can present biosecurity risks through the transfer of IMS to and within the Australian marine environment, as illustrated in the Conceptual model. IMS can colonise on among other things, submerged surfaces of petroleum facilities, equipment or vessels supporting petroleum facilities as well as in ballast water. They are difficult to eradicate once established and have long term negative effects on the environment.

As part of an environment plan, titleholders are required to evaluate all impacts and risks, including those associated with the introduction, establishment and spread of IMS for their petroleum activity. In accordance with the Australian Government's position on matters of national environmental significance, titleholders are also required to manage these risks when commencing or conducting a petroleum activity. To comprehensively understand how titleholders currently manage biosecurity risk for their activities, NOPSEMA inspected seven titleholders undertaking either drilling or production activities in the past year. NOPSEMA's inspectors focused on the risk assessment processes that are applied by titleholders to confirm that adequate measures were in place to prevent the introduction and spread of IMS within Australia.

During these inspections, NOPSEMA found examples of good practice biosecurity risk management that addressed both ballast water and biofouling risk pathways. The biofouling risk assessment processes that were considered the most developed were those aligned with the *Department of Primary Industry and Regional Development's WA — Vessel Check — Biofouling Risk Assessment Tool*, coupled with the use of clear and measurable decision criteria for managing high or uncertain IMS risk to an acceptable level prior to facilities departing overseas ports for Australian waters (e.g. dry docking, cleaning and pre-departure inspection by suitably qualified IMS inspectors). Where IMS is detected, titleholders must re-evaluate the biosecurity risk and adopt measures to reduce the likelihood of IMS establishing and spreading from an offshore facility to the Australian marine environment.

NOPSEMA also identified a number of opportunities for industry improvement and issued a series of recommendations related to risk assessment, environmental management systems, personnel competency and consultation. Consistent with the National Strategic Plan for Marine Pest Biosecurity, NOPSEMA also encouraged titleholders to consider surveillance for IMS on the submerged surfaces of facilities and subsea infrastructure using ROV footage or other relevant surveillance techniques to enable the detection and inform ongoing management.

Going forward, NOPSEMA will continue a risk-based focus on industry's management of biosecurity, taking into account the application of the Ballast Water Management Requirements 2017 and the establishment of biofouling risk assessment and management frameworks that consider relevant biosecurity management guidelines and standards. For further information or related guidance see imo.org or marinepests.gov.au.



SUMMARY OF NOPSEMA INSPECTION RECOMMENDATIONS RELEVANT TO BIOSECURITY RISK MANAGEMENT.

Risk assessment **— Ensuring IMS risk assessment processes and management controls address both biofouling and ballast water vectors and are applicable to sources of risk from by both foreign and domestic ports.**

Environmental Management System (EMS) **— Ensuring the EMS is effective in identifying and addressing contemporary requirements such as the Ballast Water Management Requirements 2017 Version 7, and new information relevant to biosecurity risk management.**

Competencies **— Ensuring that personnel responsible for implementing biosecurity risk assessment and management decisions are suitably competent.**

Ongoing consultation **— Ensuring appropriate consultation with relevant biosecurity agencies is undertaken during the development and implementation of biosecurity risk management practices and procedures.**

Overcoming scientific uncertainty and oil spill preparedness challenges

A common concern for titleholders is the length of time it takes to get an environment plan accepted by NOPSEMA. In response to this concern, NOPSEMA completed a review of its assessment outcomes to highlight and address challenges titleholders often face in getting their plans accepted.

NOPSEMA's review found that on the first submission NOPSEMA commonly required titleholders to improve the content of their environment plan and to implement more effective consultation with stakeholders. The time it took to address these requirements often extended the timeframe for acceptance of the plan and/or constrained the location, time or management of the activity.

Most of the challenges titleholders faced in meeting the regulatory requirements for environment plan content and consultation with stakeholders fell into two broad topics: 1) scientific uncertainty in predicting environmental impacts and the effectiveness of their control measures — which informs the environmental impact assessment and 2) the appropriateness of oil spill preparedness arrangements. The specific nature of these two topics varied depending on the type of activity and, in some cases, the location of the activity and the level of understanding about the environment at that location and how the activity will impact that environment.

To address these challenges, NOPSEMA has developed a list of environmental management priorities on the following page for consideration. If these priorities are addressed through appropriate study and action they have the potential to greatly improve regulatory efficiency and effectiveness and environmental management outcomes. It is NOPSEMA's vision that the offshore petroleum industry, research community, or government seek out initiatives to address these priorities in discussion with the regulator.

Initiatives already taken to address these priorities are beginning to deliver results. For example, the Australian Institute of Marine Sciences North West Shoals to Shore Research Program (aims.gov.au/nw-shoals-to-shore) which aimed, in part, to reduce the scientific uncertainty in the environmental impact assessment and management for the interaction of seismic surveys with migratory and commercially important marine species in the North West. A range of funding sources for other initiatives may be available including those arising from research grants, for example, through the National Environmental Science Program or Fisheries Research and Development Corporation (FRDC) and matched funding sources such as those facilitated by National Energy Resources Australia (NERA) or from a Good Standing Agreement under the Australian Government's exploration policy.

While a failure to address these priorities does not necessarily mean an environment plan can't be accepted, it may be necessary for a higher degree of the precautionary principle to be applied. NOPSEMA's *Environment plan decision making* guideline (GL1721) outlines how the precautionary principle is applied. For more information on the environmental management priorities, NOPSEMA encourages stakeholders to contact the regulator at environment@nopsema.gov.au.

Environmental management priorities

to achieve more efficient and effective regulatory and environmental outcomes

NORTH AND BEYOND

Environmental impact assessmentand management: seismic impacts to fish

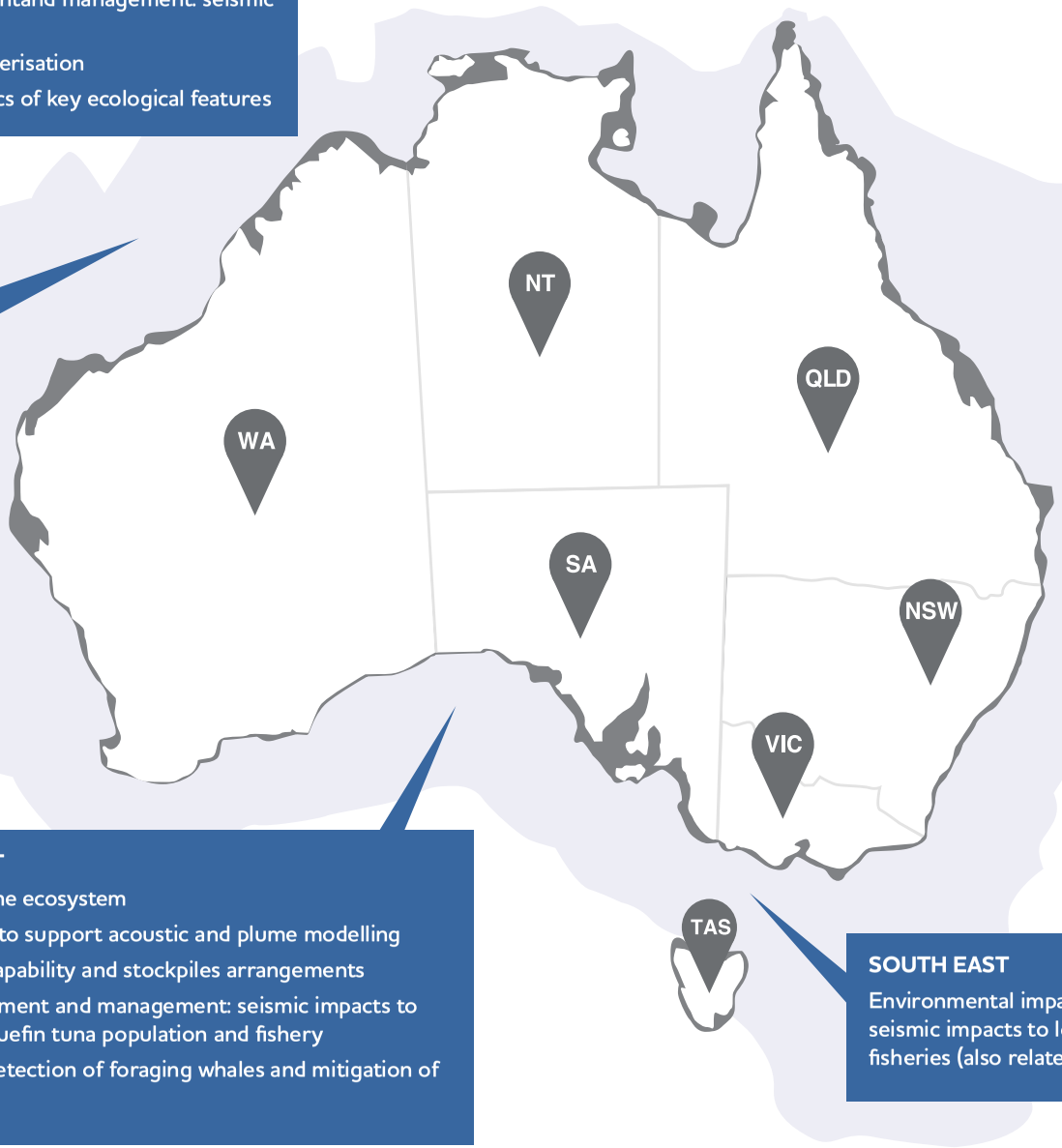
Marine ecosystem-level characterisation

Regional AMP and characteristics of key ecological features

NORTH WEST SHELF

Environmental impact assessment and management: Seismic impacts to site-attached fish and pearl oyster populations

Characteristics of Australian Marine Parks and key ecological features



ALL REGIONS

1. Regional environmental and threat assessments with stakeholder consultation
2. Framework to identify and communications research priorities for the purpose of environmental impact assessment and management
3. Rapid source control, capping stack and sub-sea dispersant arrangements
4. A national oil spill response atlas covering viability of all response strategies
5. Evidence based global good practice set of seismic mitigation measures for cetaceans
6. Seismic impact thresholds for benthic invertebrates to inform management
7. Regional fisheries profiles – online portal for existing fishing locations, activity levels and contact information
8. Review and communications of existing relevant data on sound sensitive marine species
9. Coordinated end user outreach and communication platform for petroleum

GREAT AUSTRALIAN BIGHT

Characterisation of the marine ecosystem

Physical oceanographic data to support acoustic and plume modelling

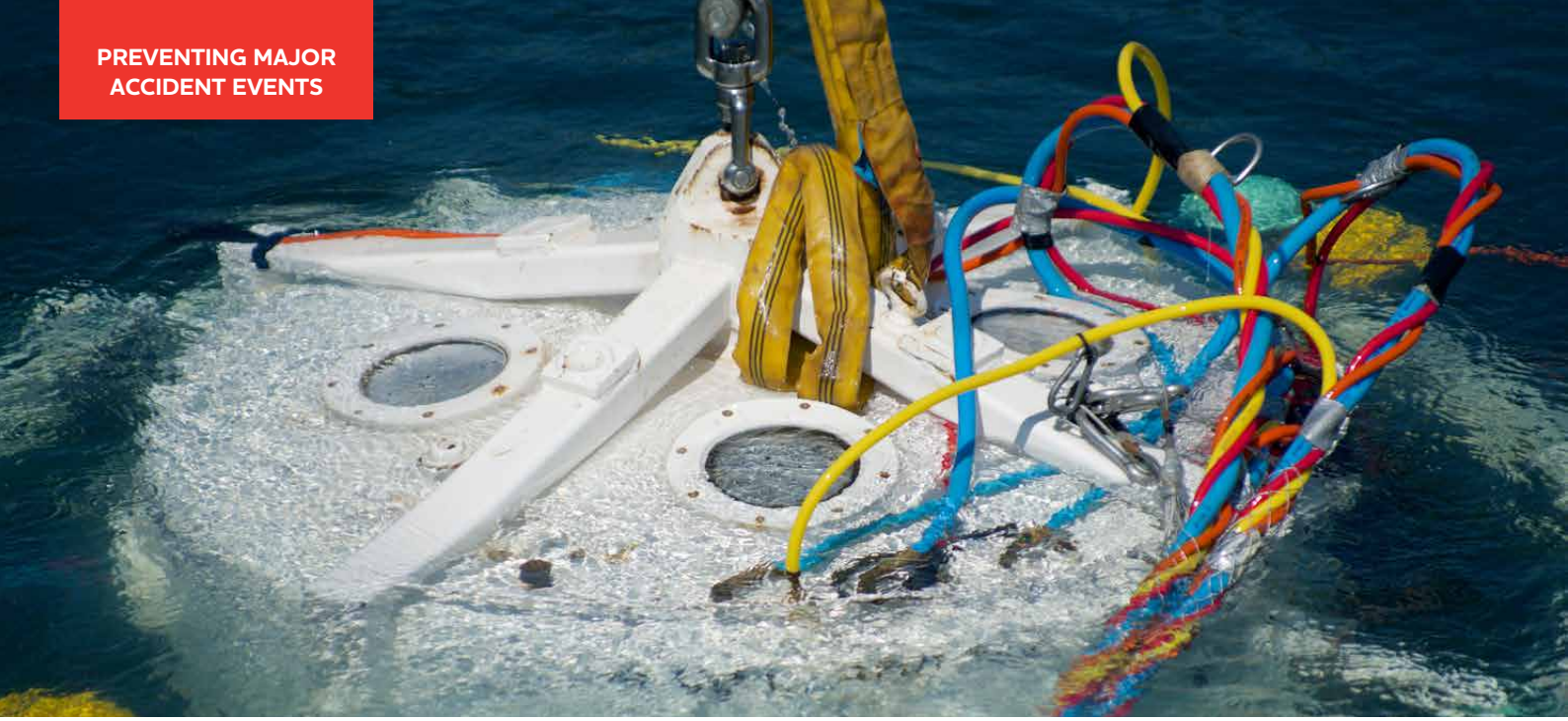
Oil spill response planning, capability and stockpiles arrangements

Environmental impact assessment and management: seismic impacts to zooplankton and southern bluefin tuna population and fishery

Best practice measures for detection of foraging whales and mitigation of sound impacts

SOUTH EAST

Environmental impact assessment and management: seismic impacts to lobsters and scallop population & fisheries (also relates to #6 for all regions)



The importance of safe diving operations

Diving contractors and operators have a responsibility to work together to deliver safe outcomes for all members of the workforce associated with diving projects. This responsibility includes ensuring diving operations are carried out in accordance with the approved diving safety management system (DSMS) and diving project plan (DPP). Any works conducted that do not comply with the DSMS and the DPP will be in breach of the diving regulations.

The DSMS must demonstrate how the diving contractor is going to undertake the diving projects so as to provide and maintain a working environment (including equipment and systems of work) that reduces risks to the safety and health of divers and other employees to a level as low as reasonably practicable (ALARP). The DSMS should detail, and ensure the continuous improvement of, operational protocols and procedures, equipment certification, maintenance and operating procedures, risk assessment procedures, and management arrangements to ensure the continued safety of the personnel involved in the diving operations.

The DPP must cover the general principles of the diving techniques to be used as well as the needs of the particular operation. It must also provide contingency procedures for any foreseeable emergency, including retrieving injured and unconscious divers from the water.

The regulations also require the diving contractor to consult with all members of the workforce including the contractor's employees and/or their representatives when developing or revising a DSMS or DPP. While some operators and diving contractors may believe that involving other members of the workforce (such as operations or project management personnel) will suffice to meet this requirement, there is no substitute for consulting at all stages of development and review with a suitable representation of those who will be directly impacted by the contents and implementation of the plan.

By adopting industry best practice and encouraging continuous improvement, safer project outcomes will be delivered and the likelihood of injuries reduced. Diving contractors who are preparing a DSMS or DPP are advised to make themselves familiar with NOPSEMA's Guidelines for complying with the Diving Safety Regulations available at nopsema.gov.au/safety/diving-operations/.

Update: Investigation into diving complaints

NOPSEMA has progressed its investigation into an OHS dangerous occurrence in relation to a number of divers were allegedly injured while undertaking saturation diving operations. NOPSEMA was first made aware of the occurrence through complaints submitted by a number of the saturation divers involved in November 2017. During the investigation, NOPSEMA executed an investigation warrant and utilised legislative powers to gather information. To date, the complainants have not been in a position to assist NOPSEMA. The investigation continues through other lines of inquiry including engagement with industry experts, medical specialists and relevant dutyholders. NOPSEMA will provide further updates regarding its investigation in due course.

Reporting of accidents and dangerous occurrences to NOPSEMA

Operators have a duty to notify and report injuries, accidents and dangerous occurrences at or near offshore facilities to NOPSEMA in accordance with the requirements of the legislation.

If operators are unsure whether an accident or dangerous occurrence is notifiable under the criteria defined in the legislation, personnel are encouraged to seek advice from NOPSEMA directly by contacting NOPSEMA's dedicated duty inspector or the facility's focal point inspector.

Operators are reminded it is an offence to interfere with the site of an accident or dangerous occurrence and permission must be obtained from a NOPSEMA inspector before doing so. The most efficient way of seeking permission is at the time of notification through NOPSEMA's dedicated notification line.

Information about how to report accidents and dangerous occurrences to NOPSEMA is outlined in the *Notification and reporting of accidents and dangerous occurrences* guidance note published at nopsema.gov.au/safety/reporting-accidents-and-dangerous-occurrences/.

To notify NOPSEMA of an accident, dangerous occurrence, environmental or well integrity incident call:

(08) 6461 7090

NOPSEMA letters go digital

In line with the Australian Government's Digital Continuity 2020 Principles, NOPSEMA is changing the way it issues correspondence relating to its regulatory operations.

From October 2018, NOPSEMA's external correspondence regarding assessment, inspection, investigation and enforcement activity features a signature authorisation number (SAN) in place of a traditional signature; this change follows a successful 10 month trial. Such letters will also only be sent via electronic means in the form of a searchable PDF document and no longer posted by mail. If an organisation does not wish to consent to receiving letters electronically then all correspondence will be delivered via Australia Post only. More information regarding consent can be found on the Making a submission to NOPSEMA page. If you have any comments or concerns, please contact the NOPSEMA Information Team at information@nopsema.gov.au.

Quarterly performance dataset – Q2:2018

INDUSTRY ACTIVITY AND PERFORMANCE

Submissions		
Category	**Type of assessment**	**Number**
Safety	Safety cases	20
	Scopes of validation	10
	Diving safety management systems	1
	Diving project plans	0
	Diving start-up notices	0
Well integrity	Well operations management plans	7
	Well activity applications	0
	Final abandonment reports	11
Environment	Environment plans	9
	Environment plan summaries	10
	End of an environment plan (regulation 25A)	4
	Offshore project proposals	0
Other	Petroleum safety zone application	0
	Petroleum safety zone access application	0
	Area to be avoided access application	0
	National Offshore Petroleum Titles Administrator request for title related information	10
Total		**82**

Incidents		
Category	**Type of assessment**	**Number**
People safety	**Accidents (immediate reporting) and Injuries (monthly reporting)**	
	Fatalities	0
	Serious injury	0
	Incapacitation / lost time injury >= 3 days	3
	Lost time injury <3 days	1
	Medical treatment injury	6
	Alternative duties injury	4
	Total accident and injuries	**14**
	Dangerous occurrences	
	Could have caused death or serious injury	10
	Could have caused incapacitation >= 3 days lost time injury	3
	Total dangerous occurrences (people safety)	**13**

Incidents		
Category	**Type of assessment**	**Number**
Process safety	Dangerous occurrences	
	Collision marine vessel and facility	0
	Damage to safety-critical equipment	21
	Fire or explosion	0
	Other kind needing immediate investigation	10
	Pipeline — kind needing immediate investigation	0
	Pipeline — likely to have resulted in significant damage	0
	Pipeline — significant damage	0
	Uncontrolled hydrocarbon release >1–300 kg	6
	Uncontrolled hydrocarbon release >300 kg	0
	Uncontrolled petroleum liquid release >80–12 500 L	1
	Unplanned event — implement emergency response plan (including false alarms)	51
	Well kick >50 barrels	0
	Total dangerous occurrences (process safety)	**89**
	Total dangerous occurrences (people and process safety)	**102**
Well integrity	Well integrity incidents	
	Loss of integrity — >1 kg gas released	1
	Failure of hydrostatic pressure — blowout preventer closure and positive well pressure	1
	Loss of integrity — well-related equipment damage or failure	4
	Potential loss of integrity — well-related equipment damage/failure	3
	Any other unplanned occurrence to regain control of the well	1
	Total well integrity incidents	**10**
Environment	Reportable environmental incidents	
	Hydrocarbon vapour/petroleum liquid release	1
	Chemical release	0
	Drilling fluid/mud release	0
	Fauna incident	1
	Matter protected under Part 3 of the Environment Protection and Biodiversity Conservation Act 1999	0
	Other	1
	Total reportable environmental incidents	**3**

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.

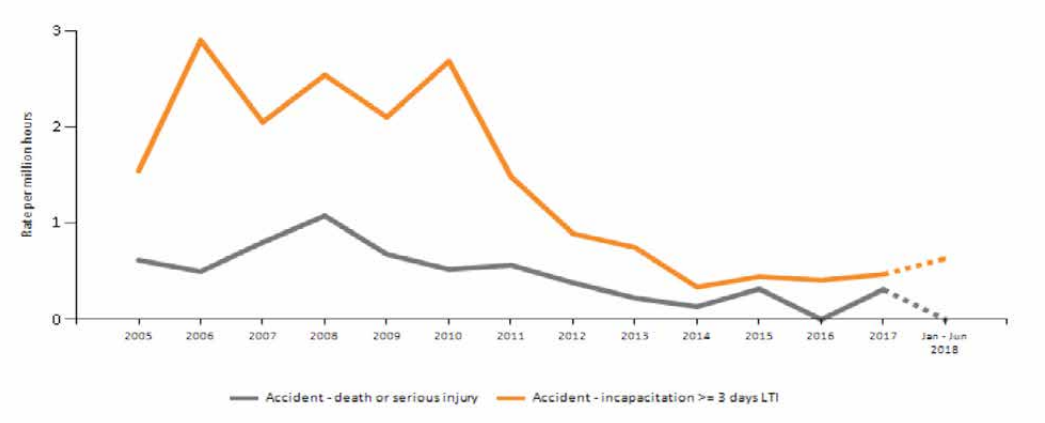
HOURS WORKED OFFSHORE

2017				2018		Current year total	Quarterly average (2017–2018)
Q1	Q2	Q3	Q4	Q1	Q2		
2 060 946	2 401 698	3 94 561	4 383 709	4 319 101	5 147 974	9 467 075	3 707 998

Note: Data represents the total number of hours worked by employees, contractors and marine crew attending a facility in NOPSEMA's jurisdiction.

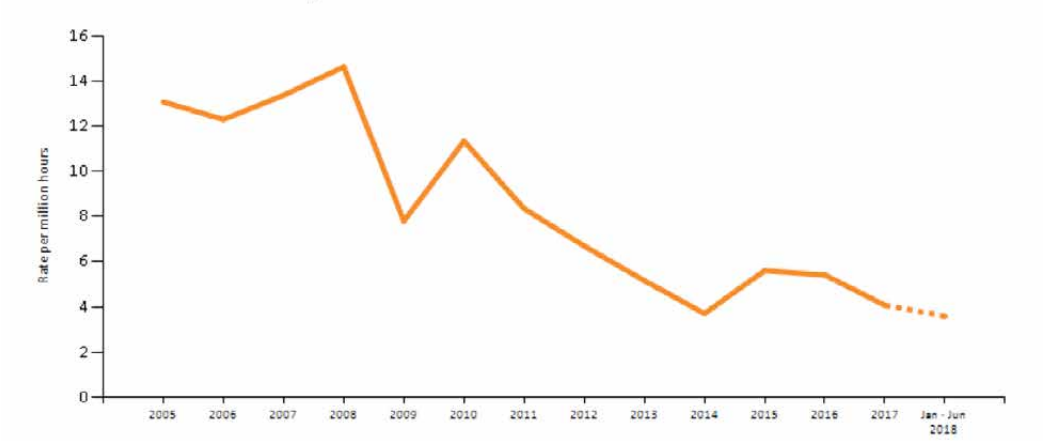
INDUSTRY PERFORMANCE INDICATORS

Accidents



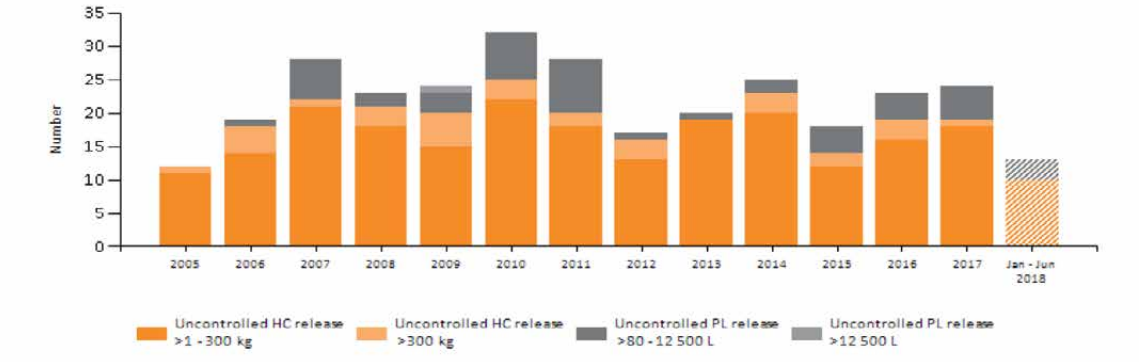
Three accidents were reported to NOPSEMA during the quarter.

Injuries



Eleven injuries were reported to NOPSEMA during the quarter, including six medical treatment injuries (MTIs), four alternative duty injuries (ADIs) and one LTI < 3 days. The TRC rate has continued its downward trend.

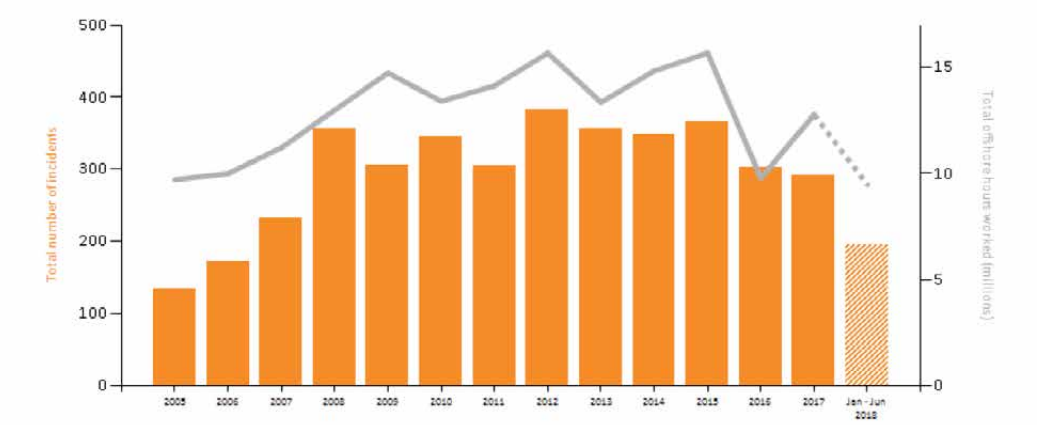
OHS hydrocarbon releases



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

One uncontrolled petroleum liquid release (>80 — 12,500 L) and six hydrocarbon gas releases (>1 — 300 kg) were reported to NOPSEMA during the quarter.

Dangerous occurences



During the quarter, 102 dangerous occurrences were reported to NOPSEMA, which is higher than the quarterly average of 81 for the last two years. The majority of the dangerous occurrences were unplanned events requiring emergency response plan implementation (50.0%) followed by damage to safety-critical equipment (20.6%).

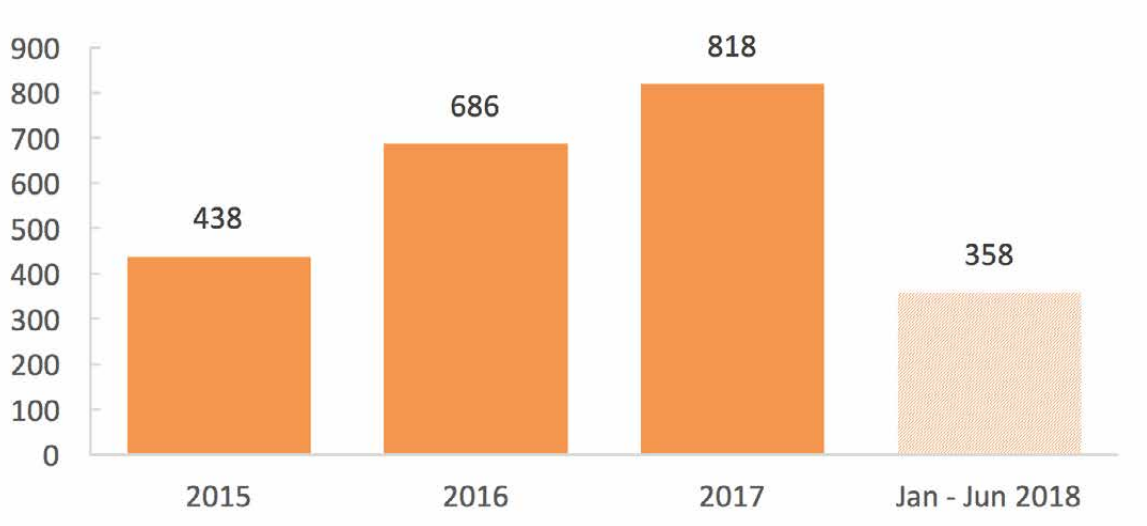
NOPSEMA ACTIVITY AND PERFORMANCE

Improvement and compliance		
Type of activity	**Category**	**Number**
Inspections	Occupational health and safety	31
	Well integrity	3
	Environmental management	18
	Total inspections	**52**
Enforcement actions*	Occupational health and safety	3
	Environmental management	0
	Directions	2
	Total enforcement actions	**5**

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

ADVICE, PROMOTION AND CONSULTATION

NOPSEMA conducted 146 liaison meetings, including engagement with duty holders (109), state, federal and international government agencies (30) and other stakeholders (7) during the quarter.

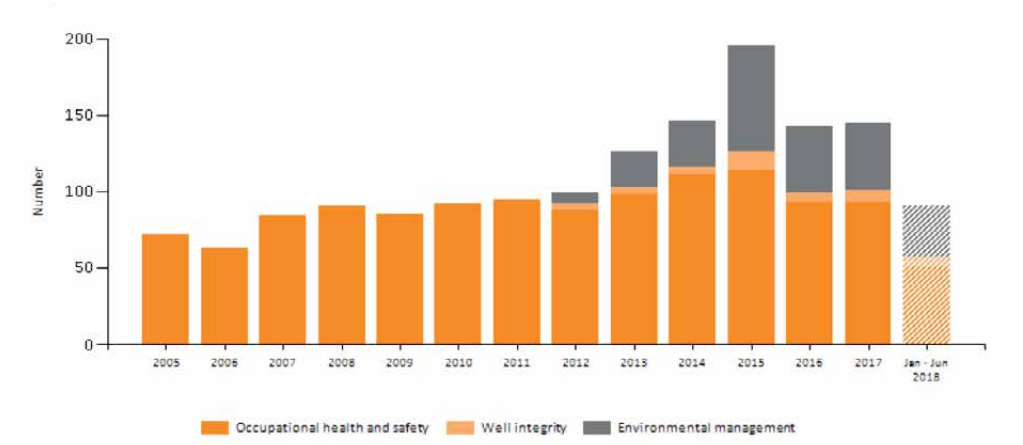


NOPSEMA PERFORMANCE INDICATORS

Notified assessments

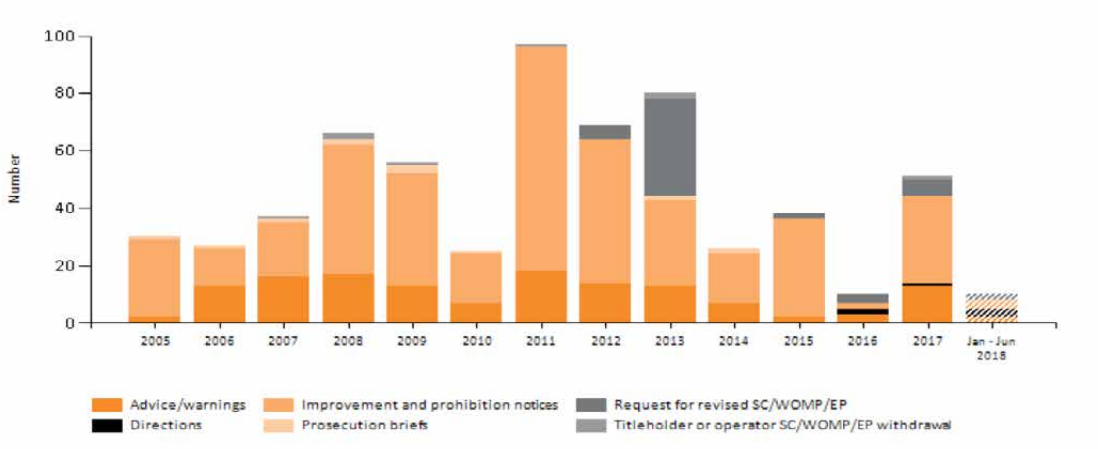
95% of all assessments were notified within legislated timeframes during the quarter. Only assessment types with legislated timeframes are included in the 'notified in time' data, however, it is NOPSEMA's policy to apply a specified timeframe on all assessment types.

Inspections



NOPSEMA conducted 52 inspections across 98 facilities and petroleum activities (a single inspection may cover multiple facilities) during the quarter.

Enforcement actions



NOPSEMA issued five enforcement actions including two occupational health and safety written advice/warnings, one request for a revised safety case and two general directions during the quarter.

Notes

Schedule of events

October 2018

30, 31 October	Consultation and transparency reforms information sessions, Perth
30, 31 October	Decommissioning discussion forums, Perth

November 2018

1 November	Consultation and transparency reforms information session, Adelaide
2 November	Consultation and transparency reforms information session, Melbourne
2 November	Decommissioning discussion forum, Melbourne
12 November	Offshore oil and gas community drop in session, Newcastle

May 2019

20-24 May	Spillcon, Perth
27-30 May	APPEA 2019 Conference and Exhibition, Brisbane

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