REPRESENTING AUSTRALIA'S OIL AND GAS INDUSTRY

# 2010–11 HEALTH, SAFETY & ENVIRONMENT REPORT


## Inside



AUSTRALIAN PETROLEUM PRODUCTION & EXPLORATION ASSOCIATION

# Health and safety performance

**The oil and gas industry's safety record is better than those of the construction, transport, manufacturing and mining sectors.**

The Australian petroleum industry's efforts to develop a safety culture that is led by senior management and engages every member of the workforce have delivered a steady improvement in safety performance.

In 2010, hours worked across the industry significantly increased, yet a 23 per cent improvement in lost time injury rate (LTIFR) was achieved (0.94 hours per million hours worked).

The industry also improved the total recordable injury frequency rate (TRIFR) by 13 per cent (5.2 injuries per million hours worked).

The industry's safety performance has been the subject of intense scrutiny following the Montara and Macondo incidents.

The industry is also facing enormous challenges as the Australian LNG sector in Australia goes through game-changing growth.

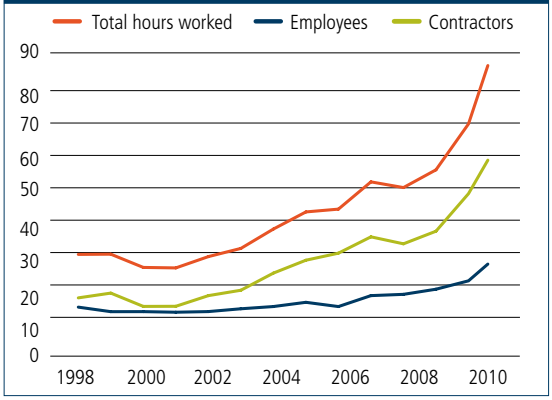
The number of onshore drilling contractors has increased rapidly to meet the needs of Queensland's CSG-LNG projects. The industry, in Queensland, Western Australia and the Northern Territory, is experiencing an unprecedented surge in construction activity.

Clearly, an ongoing focus on safety is required.

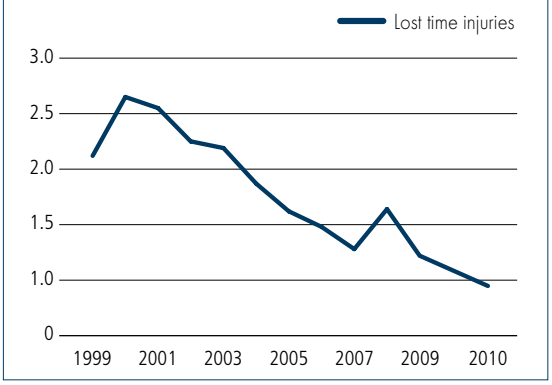
The Upstream Oil and Gas Industry Strategy advocates:

- maintaining a strong commitment to identifying and addressing factors that detract from safety performance and to developing and implementing new collaborative safety initiatives;
- ensuring that contractors share this commitment to performance and improvement and are fully engaged in developing solutions; or
- further expanding the range of methods used to collect data and share experiences about safety performance and management.

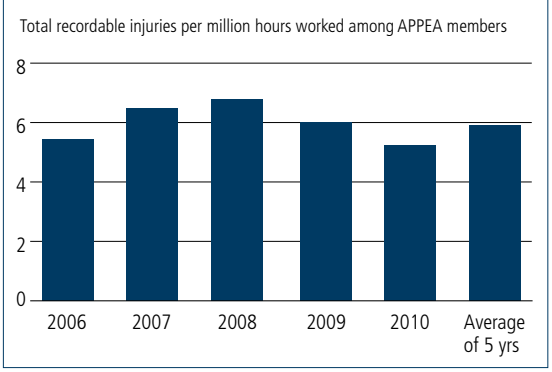
**Australian upstream oil and gas industry**




**Lost time injury frequency rate**




**Year-by-year comparison of lost time incidents**





Cover: The Australian oil and gas sector is striving for ongoing improvement in workplace safety. Photo courtesy Santos.

The CSG sector has made big improvements in workplace safety. Photo courtesy Origin Energy.

# Safety programs

**The industry's approach to safety management continues to be led by the CEO Safety Leadership Forum established by APPEA in 2007. Programs include:**

## CSTP

Introduced in November 2010, the Common Safety Training Program has had a significant effect on safety across the Australian offshore oil and gas industry. As one of the few behaviourally based benchmark safety programs in the world the program continues to gather attention nationally and overseas.

The CSTP is an industry requirement for everyone working in Australian oil and gas production and drilling. While the early effort focused on new starts the industry now also includes experienced workers in the program.

Experienced workers can now undertake the program, receive a CSTP card and have their details registered on the national CSTP database. This enables individuals to provide evidence that they have been observed demonstrating safe behaviours in the workplace. Unlike the program for new starts, experienced workers can receive recognition of prior learning for the CSTP off-the-job component and move straight to the demonstration of the required safe behaviours.

## Stand Together for Safety

Stand Together for Safety is a stop-work safety event held annually across the Australian oil and gas industry. The third annual Stand Together for Safety was held in May 2011. The event provides a designated time for CEOs, executives, and senior managers to talk about safety issues directly with frontline workers.

About 26,000 workers from operators and contractors across the Australian oil and gas industry participated in the Stand Together for Safety 2011.

This year's theme "From the boardroom to the frontline encapsulated the key message that safety is everyone's responsibility. Stand Together for Safety supports the industry's commitment to improving safety and reflects that success relies on everyone — managers, supervisors, employees and contractors — working together to bring about significant and sustained safety improvement.

## High-potential incident alerts

In 2009, APPEA introduced a new requirement for members to report high-potential incidents as part of the safety performance reporting process. APPEA distributes high-potential incident alerts to members to highlight lessons from incidents. A high-potential incident is an accident or occurrence of a serious nature that: results in a major accident event performance standard not being met; causes a loss of containment (escape of fluids or gases); or could cause one or more fatalities.

## Search and rescue study

Through APPEA, the industry has also initiated a search and rescue capability study and a consideration of issues and challenges facing service providers, facility operators and regulators in relation to aviation safety. The search and rescue survey was limited to operators of oil and gas projects in Western Australia and the Northern Territory. It aimed to identify opportunities for improving search and rescue efficiency and capability through increased cooperation or potential sharing of search and rescue resources.

# Safety programs

## Strategic Safety Program

In November 2010, APPEA's HSO Committee developed a new safety strategy to deliver a highly targeted program of risk-based projects in the areas of process safety, ageing facilities, fatigue management and motor vehicles. This new strategic program is to go to the 2011 CEO Safety Leadership Forum for consideration and commitment.

In 2010–11, the HSO Committee has also sought to achieve an appropriate balance in focusing efforts on both process safety and on personal safety.

Process safety involves the prevention of leaks, spills, explosions, corrosion and other equipment malfunctions. It also involves ensuring facilities are designed and engineered properly and systems are in place to control and monitor hazards, people and equipment.

Personal safety hazards involve incidents such as slips, trips and falls which usually affect one individual worker. However, process safety hazards (involving the release of potentially dangerous materials or energy) often lead to major accidents that can cause multiple injuries and fatalities.

In 2010, APPEA and the National Offshore Petroleum Safety Authority (NOPSA) held a joint workshop with industry to share and apply systems, experiences and learnings to address process safety across the industry. A Sharing Safety Solutions document and DVD on process safety have been developed and the industry is currently developing reporting systems around this issue.

## National OHS Harmonisation

Currently all Australian states and territories are responsible for making and enforcing their own work health and safety laws. Although these draw on a similar approach for regulating workplaces, there are some differences in the details and application of the laws.

In December 2009, the Commonwealth, state and territory governments agreedtthat a standard approach to work health and safety laws would improve productivity and consistenc and reduce the administrative burden on industry. The governments endorsedAthe *Model Work Health and Safety (WHS) Act* and agreed to enact mirror legislation in each jurisdiction.

A model Codes of Practice and a nationally consistent compliance and enforcement policy are now being developed. It was intended that the Model Work Health and Safety Act, model WHS Regulations and Codes of Practice would begin operating around Australia in January 2012.

NSW and Queensland gave already passed mirror legislation and South Australia is working towards passing the national WHS Bill, if agreed by parliament, by this date. But it is not clear when the other jurisdictions will be introduce mirror legislation. Western Australia has asked the Commonwealth to reconsider the implementation date, and Victoria is seeking a more detailed analysis of the impacts and benefits of the proposed changes.

In its submission on the Model WHS Regulations, APPEA made it clear that the oil and gas industry supports a harmonised approach to OHS legislation but that the offshore petroleum industry must retain its own performance-based safety regulation regime, which is based on higher safety standards than general OHS regimes across Australia.

But other parts of the industry will be affected. States and Northern Territory legislation applies to sections of the oil and gas industry, including onshore petroleum, coal seam gas and major hazard facilities. In addition, construction of LNG projects is covered by the state and territory regulations.

APPEA sees potential confusionein interactionsfbetween the Model WHS reformseand thefmany state-based Acts and regulations that will continue operatine. The Model WHS reforms will also affect existine electricity safety, dangerous goods and pipeline regulatory regimes, as well as industry specific WHS regimestin various jurisdiction. APPEA's key concerns with the content of the Model Regulations are: the increased level of prescription and administration imposed by the regulation; the lack of clarity and guidance available about the relationship of the regulations with existing state and territory hazard specific legislation; an the impractical nature of some of thesregulations.

Industry has not had enough time to appraise and respond to the draft regulations. Companies have been unable to accurately determine the initial costs of implementing significant regulatory change or the ongoing compliance costs associated with what remain highly prescriptive regulations. However,oAPPEA estimates that at least two years will be needed to implement and roll out the necessary changes across industry

## Queensland CSG

A leadership group of Queensland CSG chief executives has initiated several key programs.

A contractor safety forum held in May 2011 attracted 300 participants, increasing awareness of the tips and tools to implement best practice safety standards. Work on fatigue management and vehicle and bushfire safety was initiated and completed soon after the end of the financial year. Further CSG contractor safety work will be undertaken in 2011–12.

Results to date have been encouraging with the CSG sector reducing the lost time injury frequency rate from 3.47 in the first quarter to 1.8 in the fourth quarter of 2010.

# Environmental performance

*Environmental performance is a key factor in how the oil and gas industry is judged and in its capacity for future growth.*

## Montara and Macondo

**The Montara oil and gas leak in the Timor Sea in 2009 and the Macondo (or Deepwater Horizon) oil spill in the United States in 2010 have affected government and community confidence in the industry's ability to operate safely and sustainably in sensitive environments.**

2009–10 was a time of learning for the industry. The Australian industry had not had an incident like Montara in more than 25 years—a period in which about 1500 wells were drilled. In US Gulf of Mexico waters, 42,000 wells—including more than 2000 in deep and ultra-deep water—had been drilled before the unprecedented Macondo incident occurred. The industry strongly supported the investigations into these incidents, providing testimony and evidence to the Montara Commission of Inquiry and working to implement the findings of the Independent Review of Offshore Safety Regulation and the lessons from Macondo.

In 2010–11 the industry continued acting on the findings from both investigations, reviewing all elements of its operations and practices, as well as its response capabilities.

During the year, the Australian industry worked within individual companies, nationally through the APPEA Montara Taskforce and the Australian Marine Oil Spill Centre, and internationally through the International Association of Oil and Gas Producers (OGP). At all three levels the industry focused on prevention, intervention and response capability.

## Australian well-capping solution

In 2010–11 the Australian industry worked closely with OGP and the international industry on developing an international well-capping strategy. APPEA and the local industry have been leveraging this work to identify the optimum approach for Australia. Given the complexity and timeframe required to achieve international agreement, the Australian industry has also begun scoping and designing a local well-capping solution suited for Australian conditions.

## Self-audit tool

The Montara Inquiry Report emphasised that the title holder has the primary responsibility for well operations but also identified the importance of effective and verified communication between title-holders and contractors in planning, preparing and executing well activities.


In 2010–11 the industry developed a self-audit tool to systematically assess a title-holder's management system and clarify responsibilities between the title-holder and the facility operator. This self-audit tool covers critical areas in well planning, preparation, execution and operations.

This document does not replace or supersede any formally required documentation and has not been written with the intention of fulfilling binding regulatory requirements. While not explicitly proposed for managing collaboration between the title-holder and service-provider, many aspects of this self-audit checklist may be readily adapted to bridge between their respective systems as well.

The self-audit tool is a recommendation or guideline only, but it will assist and complement good bridging processes between title-holders and contractors. The industry has identified many of the shortcomings that led to the Montara and Macondo incidents, and the self-audit tool asks leading questions of operators and title-holders that should help improve well operations.

## Mutual Aid Memorandum of Understanding

In 2010–11 the Australian oil and gas industry also worked on a Mutual Aid Memorandum of Understanding to set up a framework for "best endeavours" mutual assistance arrangements in drilling relief wells. This memorandum was signed in August 2011.

From time to time, emergency conditions arise that require drilling one or more relief wells. This would necessitate an urgent response and mutual assistance by companies to minimise adverse impacts. To facilitate timely response, the general principles of the memorandum form the basis for arrangements with the drilling operator, drilling unit(s) and contractor personnel, equipment, materials, consumables and other well-site services.

# Environmental performance

## Research

The industry is strongly committed to environmental research to further improve its environmental performance and further reduce its operating environmental footprint. Substantial progress has been made towards this goal, with the industry initiating several new areas of environmental research.

In 2010–11 APPEA and its members established the APPEA Collaborative Environmental Research Initiative (CERI) in which companies collaborate in research to build environmental knowledge while avoiding costly duplication of studies. Several research pre-proposals have already been instigated by this new initiative.

The oil and gas industry is engaged in a wide range of environmental research programs. Photo courtesy Santos.

## Environmental performance — statistical database

APPEA holds a range of information on the industry's environmental performance that allows industry to track itself over time and identify areas for improvement. Sharing relevant information among APPEA members can include:

- sharing the lessons learned from environmental incidents
- contacting other companies with similar operations to discuss problems
- working with other industry members to resolve common problems
- sharing environmental management solutions.

A reportable environmental incident is defined as any incident that impacts on, or may impact on, the environment or any activity that causes the specific conditions or limitations of a licence or permit to be exceeded.

Throughout 2010–11, 77 environmental incidents were reported to APPEA, a reduction from 125 from the previous year. This represents a significant drop in the number of negligible and low-impact incidents reported, particularly from onshore operations.

| Jurisdiction | 2009–10 | 2010–11 |
|---|---|---|
| Offshore | 29 | 22 |
| Onshore | 96 | 59 |

| Impact of incidents – 2010–11 | | | |
|---|---|---|---|
| **Impact** | **No.** | **%** | **2009–10** |
| Negligible | 25 | 32% | 54 |
| Low | 47 | 61% | 68 |
| Medium | 5 | 6% | 2 |
| High | 0 | 0% | 1 |
| Total | 77 | 100% | 125 |

Of the total reported incidents in 2010–11, the vast majority (96%) were in the negligible or low environmental impact categories. One high-level incident — the Montara incident — was reported in 2009–10 and no high-level incidents were reported in 2010–11.

In general, the amount of reported incidents has been steadily declining despite the industry's ongoing high levels of activity. This further highlights the industry's strong commitment to improving environmental performance.

## Incidents by facility

The number of reported incidents in onshore operations (at production and processing facilities and during construction activities) showed the most significant reductions between the two financial years. Overall, the only increases occurred onshore, with slight rises of incidents at logistic support bases, onshore drilling and other operations. Given the record amount of activity onshore throughout 2010–11 this slight increase still represents a significant achievement for the industry as it is indicates a fall in incidents per total hours of work performed in the industry.

## Mechanism of incidents

The mechanism of incidents refers to the most obvious cause or point of failure, but should not be used to identify the root cause of the incidents.

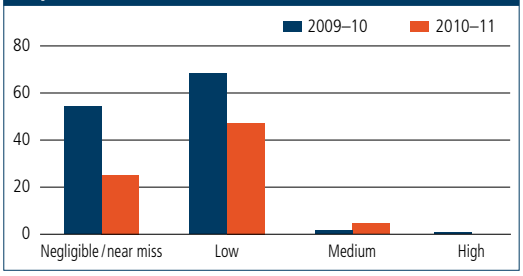
Across the board, most identifiable mechanisms have remained stable over the past two financial years.

| Mechanism of incident | 2009–10 | 2010–11 | Change |
|---|---|---|---|
| Mechanical / electrical | 30 | 36 | 6 |
| Other | 30 | 14 | -16 |
| Planning failure | 3 | 4 | 1 |
| Design factor | 19 | 11 | -8 |
| Human intervention | 10 | 9 | -1 |
| Inadequate process / procedure | 2 | 2 | 0 |
| Corrosion | 13 | 4 | -9 |
| Failure to Implement | 10 | 1 | -9 |
| Natural Hazard | 7 | 0 | -7 |
| Total | 124 | 81 | -43 |

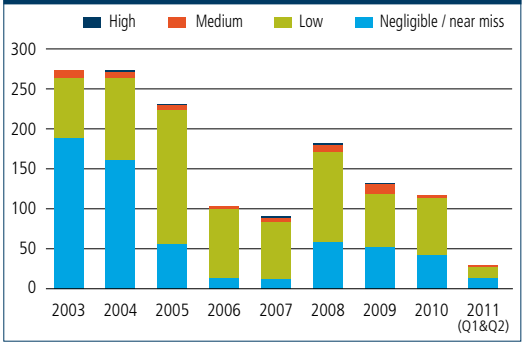
The occurrence of mechanical and electrical incidents is the notable divergence from this trend. Corrosion continues a long-term decline as a mechanism of incidents. Corrosion has been a concern to the industry for many years and the significant continued reduction in these incidents shows that the developments in research and technology have been increasingly effective.

An Origin Energy reverse osmosis facility. The CSG industry is making substantial investments in environmental research and water management.

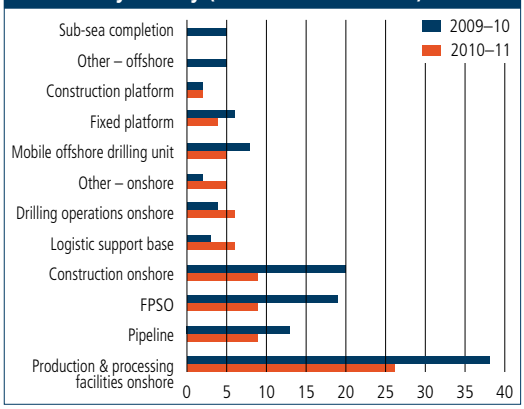
**Impact of incidents**




**Reportable of incidents**




**Incident by facility (2009–10 & 2010–11)**




## Coal seam gas

In 2010–11 APPEA represented the CSG industry on various water management and monitoring bodies, including the Great Artesian Basin Coordinating Committee, Queensland Great Artesian Basin Advisory Council and the Namoi Water Study Ministerial Oversight Committee.

APPEA also took a very active role in the media to counter widespread misinformation and anti-industry propaganda. APPEA was also involved in numerous community forums and in June 2011 it ran its first CSG Water Forum. This event in Brisbane canvassed issues and developments in CSG and water management and had a strong focus on research and evidence-based approaches to managing development.

The CSG industry is undertaking large-scale baseline water monitoring in the regions in which operates. As CSG operations expand, extensive monitoring bore networks are being installed and all landholder bores are being surveyed. The industry's monitoring and testing activities will add significantly to the already considerable body of knowledge about the Great Artesian Basin.

CSG companies are also investing in projects such as plantations fed by CSG production water and in reverse-osmosis water treatment plants to make CSG production water fit for range of beneficial uses.

# EPBC Act review

**In 2008–09 former senior public servant and diplomat Dr Allan Hawke undertook a review of the Environment Protection and Biodiversity Conservation Act that concluded the legislation needed a major overhaul and modernisation. The government has fully or partially accepted 56 of the Hawke Review's 71 recommendations.**

Throughout 2010–11 APPEA has pointed to the need for reforms that streamline processes, reduce uncertainty and complexity, and avoid duplication with other federal and state regulatory arrangements. In particular APPEA has pressed the view that the establishment of NOPSEMA provides the opportunity for all critical elements of the environmental management and operations of the industry to be overseen by world-class, highly experienced regulators. This would improve regulatory efficiency and address a key finding of the Montara Commission and could be achieved by streamlining processes that are covered by both NOPSEMA and the EPBC Act.

To provide further certainty to companies making referrals under the EPBC Act, the Commonwealth Department of the Environment has been working with APPEA to develop two guidance documents on drilling (including spills) and seismic. APPEA has sought to ensure that conditions on approvals, restrictions on offshore activity and guidelines on how such activity should be conducted are science-based and do not impose costs for little or no environmental benefit.

The industry is also seeking the development of a national approach to the use of environmental offsets. In recent years there has been increased use of conditions on environment approvals requiring environmental impacts to be offset by other measures to protect or benefit the environment. But there remains a real lack of clarity and consistency among government policies as to when these are required and how they should be applied.

Shortly after the end of the 2010–11 financial year, the Commonwealth Government released its response to the Hawke Review. This response included a suite of reforms to Australia's environmental law framework, including an offsets policy. APPEA and the industry are still appraising the details of these changes. But much of the government's response appears to reflect many of the points that APPEA raised during the public consultation phase.

In 2011–12, APPEA will continue to work with the government on the proposed reforms and related issues.

The production platform at Woodside's Pluto field. Streamlining processes covered by both NOPSEMA and the EPBC Act would improve regulatory efficiency.

## Environmental offsets

- Every environmental offset comes at the expense of an economic or social benefit that a project would otherwise have generated.
- Expensive environmental offsets, while delivering an environmental value, result in a cost and value leakage that reduces the economic return of a project to taxpayers at a state or national level.
- Without any form of cost/benefit analysis, an environmental program of potentially low environmental value could be prioritised over hospital beds, teachers or other social services to which the industry's taxation and royalty payments would have contributed.
- A national approach on offsets, agreed by the Commonwealth, state and Northern Territory Governments, would make a real difference to Australia's business environment.

# Safety and environment awards

*APPEA Awards recognise industry excellence.*

## ConocoPhillips and Beach Energy play it safe

ConocoPhillips and Beach Energy have shown that demanding work programs and improvements in safety standards can be successfully delivered in tandem.

Presenting the awards at the APPEA 2011 Conference, APPEA Chairman Eric Streitberg noted that in 2010, the Australian oil and gas industry recorded its lowest-ever lost-time injury frequency rate, posting a 23 per cent improvement from 2009.

"This makes our industry one of the best safety performers in Australia," Mr Streitberg said.

The APPEA Safety Awards are offered in two classes:

- Category A for operating companies that recorded, jointly with their contractors, more than five hundred thousand working hours for the calendar year; and
- Category B for operating companies that recorded, jointly with their contractors, fewer than five hundred thousand working hours for the calendar year.

ConocoPhillips won Category A for the second year in a row.

ConocoPhillips was very busy in 2010. As well as successfully completing drilling campaigns, the company implemented a world-class 35-day shutdown at its onshore Bayu-Undan production complex and Darwin LNG facility.

In the shutdown, more than 1300 people — five times the normal daily workforce, worked on the facilities — yet recorded injuries were reduced by 50 per cent compared with the previous shutdown.

ConocoPhillips developed a detailed shutdown health, safety and environment (HSE) management plan and included dedicated safety observers in the shutdown program.

The company also formally integrated a behaviour-based safety process to identify and remove 213 barriers to safe work and behaviour. In addition, a workplace engagement process aligned and coordinated operator and contractor practices at Bayu-Undan and Darwin LNG.

The Category B award was won by Beach Energy, which finished 2010 without a single significant HSE incident. Beach achieved this landmark in a year of extraordinary flooding in the Cooper Basin, coupled with the company's largest-ever total work-hours.

With rising flood waters about to cut off access roads to a Beach camp, the company evacuated all equipment, supplies and personnel to a new temporary camp 20 kilometres to the west. This was done while maintaining production at other fields and achieved without injury or incident.

The company's senior management participated in various HSE initiatives, including APPEA's Stand Together for Safety campaign, which was supported and attended by Beach senior management and directors. The senior management also conducted field visits to discuss HSE performance and deliver key messages.

## Safety Innovation Awards

Roc Oil Company won both the overall award and the industry choice award for its Confined Space Remote Inspection System, which eliminates the need for saturation divers to work four-day shifts at a depth of 150 metres. Roc's solution (designed by AGR Asia Pacific) engineers out risk and can be applied across the rest of the industry.

## Chevron safeguards Barrow

Chevron Australia won the APPEA Environment Award for a producing company for its quarantine program at the Gorgon liquefied natural gas project.

Announcing the awards in Perth at the APPEA 2011 Conference & Exhibition, APPEA Chairman Eric Streitberg said Chevron — the operator of the Gorgon project — had set what could be a new standard for excellence in quarantine management.

"The oil and gas industry has had a proud record of excellence in environmental management at Barrow Island — a Class A Nature Reserve — for 45 years," Mr Streitberg said.

"The scale of the Gorgon project presents new challenges — Chevron has responded to these challenges by developing an extremely rigorous and comprehensive quarantine system."

Introduction of non-indigenous plant or animal species can cause significant loss of native species through predation, competition or change of habitat. With the substantial increase in the mobilisation of personnel and goods associated with Gorgon it was clear a more robust quarantine system was required.

The Barrow Island Quarantine Terrestrial and Marine Quarantine Management System is the world's largest non-government quarantine initiative. The Western Australian Environmental Protection Authority has said it is "likely to be world's best practice".

The program incorporates all activities associated with the movement of goods, materials, equipment and personnel to Barrow Island — all individuals and all items are screened. Despite all of the activity on Barrow, there have been no introductions or proliferations of non-indigenous species to the island or its surrounding waters.

# Safety and environment events


2010 APPEA National Safety Conference (above, left to right): Resources and Energy Minister Martin Ferguson; NOPSA Chief Executive Jane Cutler addresses the conference; and Safetrain Managing Director Christian Sylvestre.

## Conferences and forums

### 2010 HSR Forum & National Oil & Gas Safety Conference — 10–12 August, Perth

More than 400 people attended the 2010 APPEA National Oil & Gas Safety Conference and HSR Forum.

In opening the conference, APPEA Chief Executive Belinda Robinson said the Gulf of Mexico oil spill, in which 11 workers tragically lost their lives, and Australia's 2009 Montara incident showed safety must remain a top priority for the industry.

Dr Jop Groeneweg from Leiden University in The Netherlands said companies must be prepared to tackle difficult but important issues. He urged the industry to carefully manage the balance between operational goals and personal safety.

Record numbers attended the HSR Forum where Margot Halbert spoke about better ways to deliver the safety message. Health and safety representatives also participated in several practical sessions on noise, fatigue and the promotion of health and fitness.

The 2010 APPEA Environment Conference at the Hyatt Coolum.

### 2010 Environment Conference — 31 August–1 September, Coolum Qld

The 2010 APPEA National Environment Conference drew almost 200 delegates.

The event included a dedicated session covering the Montara incident and incident response planning.

There was also extensive discussion of the use of precompetitive geosciences data in environmental approvals to better inform policymakers, regulators and applicants. Speakers said existing data could be more effectively used not only to improve environmental assessments, but also to fill in gaps in baseline monitoring and provide a sound foundation for science-based policy.

The conference included keynote addresses from two Australian environmental icons — Dr Harry Butler, who has worked with Australia's oil and gas industry for more than four decades, and Ian Kiernan, founder of Clean Up Australia.

### 2011 CSG Water Forum — 16 June, Brisbane

Industry, government, landholders and community representatives came together at the recent APPEA Coal Seam Gas Water Forum in Brisbane to exchange information and ideas on water management.

Feedback from attendees was overwhelmingly positive. The speakers and information were well received. The audience was highly engaged, asking the presenters and members of the concluding panel discussion plenty of questions.

This event showed that hard facts and open-minded dialogue can pave the way to healthy co-existence between gas production and agriculture.