

# Petroleum Act compliance report 2008

Petroleum and Geothermal Group



**Government of South Australia**  
Primary Industries and Resources SA

# **Petroleum Act compliance report 2008**

**Petroleum and Geothermal Group**

**Report Book 2009/8**

**May 2009**

## **Petroleum and Geothermal Group**

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This report is also available on the PIRSA website (see above). Go to Petroleum, Legislation & Compliance, Compliance & Enforcement; Petroleum Act Compliance Report.

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### **Preferred way to cite this publication**

Primary Industries and Resources South Australia 2009. *Petroleum Act compliance report 2008*, Report Book 2009/8, Petroleum and Geothermal Group. Department of Primary Industries and Resources South Australia, Adelaide.

### **Cover**

Dave Cockshell inspecting Western Geco seismic gear, Bookabourdie, Cooper Basin, 2007 (photo 407535); Steam flow from Habanero 3 (March 2008) in the Cooper Basin where Geodynamics Limited is working to demonstrate the concept of producing energy from hot granites (courtesy of Geodynamics; photo 407240); Belinda Hayter (PIRSA) onsite during laying of the pipeline from Moomba (SA) to Jackson (Qld), 2008 (photo 407240); CO<sub>2</sub> removal towers, Moomba, Cooper Basin (photo 043372).

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## SUMMARY

- PIRSA completed its consultation on the draft Petroleum Act 2000 Amendment Bill and, in response to submissions received, finalised the Bill to amend the *Petroleum Act 2000* which will be ready for tabling in Parliament in April 2009.
- Five new statements of environmental objectives were approved and gazetted covering pipeline, production and geothermal power generation activities, see Section 3.2 for further details.
- A total of 217 activity notifications covering various geophysical, drilling and production operations were submitted and reviewed and, where required, approved by PIRSA.
- Companies built on last year's efforts and undertook and submitted to PIRSA self assessments of the effectiveness of their health, safety and environment management systems. Details are discussed and provided in Section 3.4.
- The Moomba Plant fitness-for-purpose review by PIRSA, in collaboration with SafeWork SA, was concluded.
- A total of 92 annual compliance reports were received by PIRSA from licensees for review.
- Field inspections by PIRSA continued during 2008 as in previous years. Results of these inspections in relation to restoration activities of geophysical seismic lines, wellsites and borrow pits show over 90% compliance was achieved. Details are provided in Section 3.9.
- A serious incident occurred in January 2008 resulting in a fatality on a drilling rig operating in the Cooper Basin. Details are provided in Section 4.
- Four serious gas supply outages and two cultural site disturbance incidents occurred. Details are provided in Section 4.
- There were six incidents of noncompliance resulting in PIRSA actioning 'Step 2: Persuasive measures' (in accordance with PIRSA's compliance and enforcement pyramid; Fig. 1). These noncompliances relate mainly to reporting and notification breaches. Details are provided in Section 5.
- There were two incidents of noncompliance resulting in PIRSA actioning 'Step 3 Compulsive measures'. Both these incidents resulted in PIRSA issuing a direction to the licensee to cease operations until certain conditions were satisfied. Details are provided in Section 6.
- Oil spills for 2008 totalled 26 m<sup>3</sup>, which remains at <0.01% of total oil produced for the year and resulted in low environmental consequences. Other industry compliance statistics for 2008 such as security of supply, OHS&W and gas release incidents, together with an analysis of their root causes, are provided in Section 8.

## 1 INTRODUCTION

The *Petroleum Act 2000*<sup>1</sup> covers all exploration and production activities for petroleum, gas storage and geothermal resources for onshore South Australia, as well as the technical regulation of gas transmission pipelines. In summary, the key objects of the Act include:

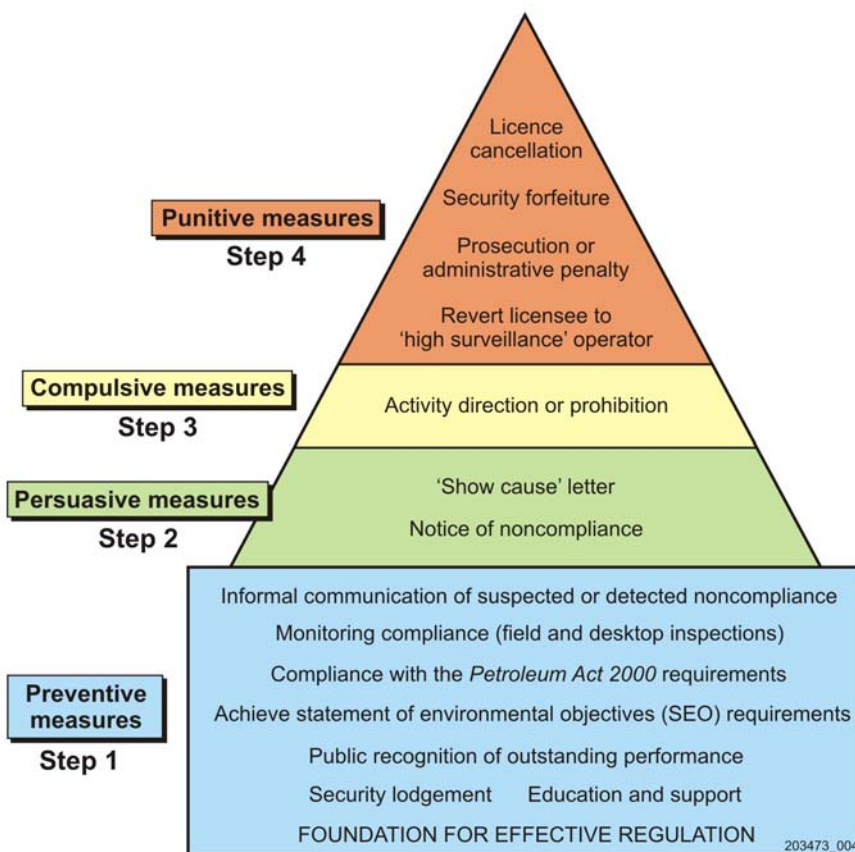
- providing security of tenure to licensees for the resources covered by the Petroleum Act
- protecting the environment and public from the inherent risks associated with the activities undertaken to exploit these resources
- ensuring appropriate levels of security of natural gas supply are provided for.

It is the pursuit of these objectives that drive the compliance and enforcement priorities of the Petroleum and Geothermal Group of PIRSA. This report covers the year 2008 and its purpose is to:

- outline PIRSA's regulatory activities in administering the Petroleum Act
- provide a summary of the regulatory performance of the industries covered by the Act.

## 2 COMPLIANCE AND ENFORCEMENT

Compliance of the industries regulated under the Petroleum Act is presented in the context of the compliance and enforcement pyramid (Fig. 1) adopted by PIRSA for monitoring and enforcing compliance.



**Figure 1** PIRSA Petroleum and Geothermal Group compliance and enforcement pyramid.

1 One of the intended amendments to the Petroleum Act is to rename this legislation as the 'Petroleum and Geothermal Act' to reflect its coverage of both upstream petroleum and geothermal energy licences.

The pyramid details a series of steps and measures available to PIRSA for facilitating, monitoring and, where necessary, enforcing compliance. PIRSA aims to maintain its regulatory activities at 'Step 1: Preventive measures', shown as the base of the pyramid in Figure 1. In cases where industry fails to adequately and appropriately respond to detected noncompliance, 'Step 2: Persuasive measures' is instigated. Only in extreme and exceptional cases would PIRSA expect to utilise Steps 3 and 4, 'Compulsive' and 'Punitive' measures, respectively, to enforce compliance and achieve acceptable environmental or administrative outcomes.

### 3 PREVENTIVE MEASURES

Preventive measures include:

- Maintaining an effective and efficient regulatory regime through one-window for all co-regulation pursuant to all state (such as the *Environment Protection Act 1993*) and Commonwealth Acts (such as the *Native Title Act 1993*) — with PIRSA having stewardship responsibility to manage that one-window for co-regulation.
- Administering the approval and compliance requirements of the Petroleum Act.
- Monitoring regulatory compliance (undertaken by both licensees and PIRSA), through audits and inspections (both field and desktop).
- Working collaboratively with licensees, industry and stakeholders to clarify and advise on regulatory requirements and expectations.
- Addressing stakeholder interests and requirements through the statements of environmental objectives to establish and maintain their trust.

During 2008 these preventive measures as they relate to both PIRSA and industry are discussed below.

#### 3.1 Preventive measures enabled through the Petroleum Act

It is widely recognised that the Petroleum Act and its associated Regulations deliver a best practice regulatory framework. This was acknowledged in 2008 through the draft [Commonwealth Productivity Commission review into regulatory burden on the upstream petroleum \(oil and gas\) sector in Australia](#). The final form of that review confirmed these findings<sup>2</sup>.

Since the promulgation of the Petroleum Act in September 2000, PIRSA continues to review the effectiveness of the Act to ensure it continues to facilitate acceptable industry behaviour and performance in relation to environmental protection, public safety, security of gas supply, and protection of other land user rights. In 2008 PIRSA released the draft Petroleum Act 2000 Amendment Bill 2008, and consulted extensively with both industry and non-industry stakeholders on it. The final Bill is expected to be tabled in the South Australian Parliament by the end of the first quarter of 2009.

The proposed amendments seek to enhance the Petroleum Act to cover new forms of complementary licences (for gas storage and facilities) and to improve the efficiency of its processes so that industry and stakeholder interests are satisfied more cost-effectively. Elements of these enhancements have been driven by the need to align certain provisions of the Act with national initiatives, through the Ministerial Council on Mineral and Petroleum Resources, seeking consistency in legislation across Australia.

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<sup>2</sup> Australian Government Productivity Commission <[www.pc.gov.au](http://www.pc.gov.au)>. Go to Publications, *Review of regulatory burden on the upstream petroleum (oil and gas) sector*, Productivity Commission Research Report.

### 3.2 Statement of environmental objectives — approvals and reviews

Effective preventive measures can only be established if the regulatory objectives for regulated activities are relevant to the risks associated with such activities and satisfy stakeholders' interests and concerns. This is achieved under the Petroleum Act via the development and approval of statements of environmental objectives (SEOs) through open and transparent stakeholder consultation. Under the Act, no activity can be undertaken unless it is covered by an approved SEO. Approved SEOs become project-specific regulations that are gazetted and made publicly available from the [Environmental Register](#) on PIRSA's website<sup>3</sup>.

SEOs are a means of enabling PIRSA to act as a one-stop shop on behalf of co-regulatory agencies. Embedding the objectives and standards of co-regulatory regimes in SEOs fosters mutual trust between government agencies charged with the co-regulation of resource exploration and production operations. Formal memoranda of understanding and administrative arrangements agreed by co-regulatory agencies can explicate mutual expectations and underpin both the efficiency and effectiveness of co-regulation. Trust engendered with SEOs is reflected with the memoranda of understanding and administrative arrangements established between PIRSA and key co-regulatory agencies, including South Australia's Department for Environment and Heritage, Environment Protection Agency (SA), Office of the Technical Regulator, SafeWork SA and Planning SA.

By incorporating the objectives and standards of co-regulatory agencies into SEOs, a breach of standards set by other legislation also becomes a breach of the SEOs pursuant to the Petroleum Act. Approval of SEOs brings into force area and operation-specific criteria to measure licensees' compliance with environmental objectives and outcomes.

Eight regional SEOs have been developed for: airborne geophysics in South Australia; geophysical operations in the South Australian Cooper Basin; geophysical operations in the South Australian Otway Basin; geophysical operations in the Arckaringa Basin; drilling and well operations in the South Australian Cooper Basin; drilling in the Arckaringa Basin; pipeline preliminary survey activities in South Australia; and non-seismic ground-based geophysical operations (such as electromagnetic, gravimetric and magnetic surveys) within South Australia. Regional SEOs can cover a range of landforms and activities with varying levels of impact risk. This variability is reflected in the SEOs, and specific local issues for individual work programs are addressed one-by-one when applications to undertake activities are lodged.

All other SEOs are operator-, operation- and area-specific. Pursuant to the Petroleum Act, all licensees are required to report on their performance against SEOs and, following the principle of transparency, these reports are available to the public from the Environmental Register.

During 2008 a number of new SEOs were developed and existing SEOs reviewed (Tables 1, 2).

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<sup>3</sup>[www.pir.sa.gov.au](http://www.pir.sa.gov.au) Go to Petroleum, Environment & Land Access, Environmental Register.

**Table 1** New SEOs gazetted in 2008 for regulated activities

Company	Activity	Location	Date gazetted
Epic Energy SA Pty Ltd	Pipeline (Pipeline Licence 18)	Ballera to Moomba	20 March 2008
Sapex Limited	Drilling	Northern St Vincent and Walloway basins	10 July 2008
Geodynamics Limited	1 MW geothermal power plant	Cooper Basin	28 August 2008
Victoria Petroleum NL (Victoria Oil Exploration (1977) Pty Ltd)	Production	Cooper Basin	30 October 2008
Stuart Petroleum Limited	Production	Cooper Basin	30 October 2008

**Table 2** SEOs reviewed and currently under review in 2008

Company	Activity	Location	Date gazetted
Officer Basin Energy Pty Ltd	Geophysics	Officer Basin	15 January 2009 (revised from 2003)
Beach Petroleum Limited	Production	Cooper Basin	Under review
Santos	Drilling and well operations	Cooper Basin	Under review
Santos	Production and processing operations	Cooper Basin	Under review
Epic Energy SA Pty Ltd	Pipeline (PL 1)	Moomba to Adelaide	Under review
Santos	Pipeline (PLs 5, 9, 15)	Cooper Basin	Under review
Envestra	Pipeline (PL 6)	Riverland	Under review
Australian Pipeline Trust	Pipeline (PL 7)	Moomba to Sydney	Under review
Gorodok Pty Ltd	Pipeline (PL 8)	Moomba to Sydney	Under review
Envestra	Pipeline (PL 11)	Berri to Mildura	Under review
South East Australia Gas Pty Ltd	Pipeline (PL 13)	Iona to Adelaide	Under review

PL pipeline licence

### 3.3 Activity notifications

In accordance with regulations 18 and 19, licensees are required to notify PIRSA prior to commencing any regulated activity within a licence area. For low-level supervision operators, 21 days notice is required. For high-level supervision operators, 35 days notice is required. In the case of the latter, regulation 19 requires the licensee to obtain approval before commencing their activities, where approval is granted on the basis of the licensees' demonstrated capability against regulation 16 operator assessment factors.

Activity notifications received by PIRSA for geophysical, drilling and production operations decreased from 289 in 2007 to 217 in 2008 (Fig. 2).

During 2008 these notifications included:

- 18 for geophysical activities (11 for high-level supervision), with notification provided for 13 seismic surveys and 5 other geophysical surveys. One activity notification was lodged to conduct the first seismic survey for geothermal exploration in South Australia by a geothermal operator. Similarly to 2007, PIRSA noted on several occasions the high standard of operational policy and procedure put in place by high-level supervision operators when undertaking geophysical operations during 2008.
- 88 for drilling activities (22 for high-level supervision), of which 17% were drilling notifications related to geothermal operations.
- 111 for production activities (40 for high-level supervision).

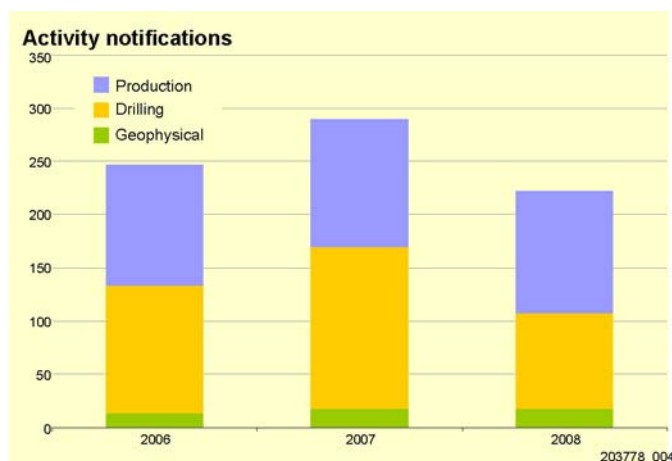


Figure 2 Activity notifications submitted to PIRSA, 2006 to 2008.

### 3.4 Operator capability assessment — health, safety and environment management systems and resources

As part of its preventive measures, PIRSA requires all high-supervision licensees to demonstrate their capability to achieve the relevant SEO and regulatory requirements prior to gaining approval to commence their activities. This demonstration eventually leads to low-supervision status under the Petroleum Act. The demonstration is required to address the effectiveness of licensees' management systems, competency and skills of licensees' human resources, and suitability of licensees' equipment (as per regulation 16 operator assessment factors).

As part of demonstrating capabilities against the regulation 16 operator assessment factors, licensees and contractors are beginning to carry out and report to PIRSA their management system self-assessments using the [self-assessment tool recommended by PIRSA](#) and published on PIRSA's website<sup>4</sup>. The main focus of the self assessment is to assess the effectiveness of licensee health, safety and environment (HSE) management systems, in particular workforce understanding, implementation and resultant behaviour in relation to the various elements of the system. The elements addressed by the self-assessment tool include:

- management commitment and leadership
- health, safety and environment policies and objectives
- responsibilities
- training and competencies
- contractor management
- communication
- risk and hazard identification and management

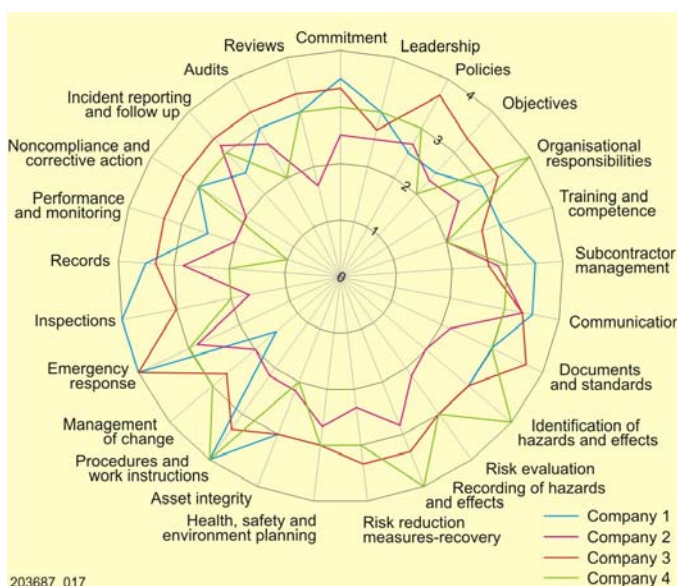
4 <[www.pir.sa.gov.au](http://www.pir.sa.gov.au)> Go to Petroleum, Legislation & Compliance, Activity Approval Process, HSE Management Systems.

- asset/equipment integrity management
- operating procedures and work instructions
- management of change
- emergency management
- inspection and auditing
- incident management and corrective actions.

The assessment criteria score each element on a scale from level 1 to level 4, where level 1 indicates poor performance requiring urgent attention for the particular element assessed, while level 4 represents best practice.

The self assessments assist both the licensee and PIRSA to gain an appreciation of where the individual licensees are with respect to the effective implementation of their management systems and to identify areas for improvement (e.g. areas targeted for more detailed audits). Being a self-assessment process, disclosure of the results are provided to PIRSA on the understanding that they are to be used as a basis for monitoring progress against continuous improvement of the company's system and not as a basis for regulatory enforcement or punitive action. However, they provide a basis on which PIRSA can work with the individual licensee to assist the licensee in gaining low-supervision status pursuant to section 74 of the Petroleum Act. This assistance involves PIRSA inspections and regulatory surveillance activities focusing on those areas identified by the self assessment as requiring improvement.

The results of the self assessments carried out during 2007 by four licensees and the results of those carried out by three different licensees during 2008 are presented in Figures 3 and 4 respectively. The results in Figure 4 show that during 2008 one licensee self assessment revealed best practice for the majority of management system elements (i.e. score of 4). Through various means, including PIRSA observing a number of internal licensee audits, the licensee demonstrated to PIRSA that such scores truly reflected the state of the licensee's management systems. Similarly, the licensee also demonstrated to PIRSA areas of required improvement for those elements which attained less than best practice scores.



**Figure 3** Results of self assessments carried out on company health, safety and environment management systems in 2007.



**Figure 4** Results of self assessments carried out on company health, safety and environment management systems in 2008.

In 2009 PIRSA will continue to seek to extend the application of this assessment tool to more licensees and contractors.

### 3.5 Quarterly compliance meetings

PIRSA strives to work in a cooperative and educative manner with licensees to proactively facilitate regulatory compliance. A key component of this strategy is the quarterly compliance meetings between PIRSA and individual licensees, where regulatory and compliance issues are discussed, reviewed and monitored. In the case of drilling operations, PIRSA also meets quarterly with individual drilling contractors to discuss compliance issues specific to drilling operations. In 2008 PIRSA continued to meet quarterly with Santos, Beach Petroleum Limited, Stuart Petroleum Limited, APT O&M Services (formerly Origin Energy Asset Management Ltd), Epic Energy SA Pty Ltd and South East Australia Gas Pty Ltd (SEA Gas). PIRSA also met with Origin Energy Resources Ltd and the APA Group during 2008.

In addition, PIRSA attends a number of industry forums such as the Santos-facilitated wellsite forum. This quarterly forum brings all licensees and contractors together to discuss and review various safety and environmental matters. The petroleum industry’s peak national body, the Australian Petroleum Production and Exploration Association (APPEA), also convenes an annual environmental conference which PIRSA attends.

PIRSA participates in, and convenes, forums to enable it to monitor and contribute proactively in compliance initiatives. Such forums involve the Australian Pipeline Industry Association (APIA), Australian Geothermal Energy Association (AGEA), South Australia Chamber of Mines and Energy (SACOME), Environmental Institute of Australia and New Zealand (EIANZ), Australian Environmental Law Enforcement and Regulators Network (AELERT), and peak professional bodies such as the Society of Petroleum Engineers (SPE), Petroleum Exploration Society of Australia (PESA), Australian Society of Exploration Geophysicists (ASEG) and Australian Geothermal Energy Group (AGEG).

### 3.6 Fitness-for-purpose reviews

In accordance with the preventive focus of Step 1 in the compliance pyramid, the Petroleum Act requires licensees to ensure that their facilities are maintained to be fit for purpose. In line with best practice regulatory requirements, the focus is on eliminating any risks, or where it is not possible to eliminate, to

minimise these risks to an acceptable level. Under regulation 30, licensees are required to assess and report to PIRSA on the fitness for purpose of their respective facilities at least every five years. These assessments are required to address the physical condition of the facilities and the effectiveness of the management systems utilised for operating and maintaining them. By reviewing these reports, PIRSA seeks to assess the integrity of the conclusions reached by the licensee. [Fitness-for-purpose assessment reports](#), together with PIRSA reviews, are available from the Environmental Register on PIRSA's website<sup>5</sup>.

In the fitness-for-purpose assessments discussed below, all licensees concluded in the reports that their facilities were fit for purpose. PIRSA's report review and validation process involved a detailed review of key areas of interest, to confirm the validity of the conclusions made.

### *3.6.1 Moomba facilities*

In 2008 PIRSA concluded its review of Santos's September 2006 fitness-for-purpose assessment report on the Cooper Basin oil and gas processing facilities (including the Moomba Gas Plant, pipelines and wells)<sup>6</sup>. This review was undertaken collaboratively with the Major Hazardous Facility Unit within SafeWork SA. The review concluded that the report adequately addressed the majority of the regulation 30 requirements, in particular, those relating to the current and ongoing:

- physical condition/integrity of facility equipment and utilities
- effectiveness of the facility management and maintenance systems
- management of risk to ensure safe and effective operations.

Notwithstanding the adequacy of Santos's 2006 fitness-for-purpose assessment report, PIRSA and SafeWork SA will continue to monitor Santos's performance in these areas through both site visits and document review of key system and risk mitigation control measures.

### *3.6.2 Moomba to Adelaide Pipeline*

A fitness-for-purpose assessment for the Moomba to Adelaide Pipeline, Pipeline Licence (PL) 1, was prepared and submitted to PIRSA by Epic Energy in February 2008. Following a review of this report, PIRSA sought further information and demonstration regarding the effectiveness of Epic Energy's management systems. On the basis of this information and the information provided in the report, PIRSA was satisfied that the requirements of regulation 30 had been satisfied.

### *3.6.3 Ballera to Moomba, Stokes to Mettika and Moon to Kerna pipelines*

A report detailing the fitness-for-purpose assessments undertaken by Santos for the Ballera to Moomba (PL 5), Stokes to Mettika (PL 9) and Moon to Kerna (PL 15) pipelines was submitted to PIRSA in April 2008. The report concluded that these pipelines are fit for the ensuing five-year period. PIRSA is currently reviewing the information provided in this report to verify this conclusion.

### *3.6.4 Riverland Pipeline*

A fitness-for-purpose assessment for the Envestra-owned Riverland Pipeline (PL 6) prepared by the pipeline operator, APT O&M Services Pty Ltd (part of the APA Group), was submitted to PIRSA in April 2008. This report concluded that the Riverland Pipeline is fit for service for the ensuing five-year period. PIRSA is currently reviewing the information provided in this report to verify this conclusion.

### *3.6.5 Drilling rigs*

During 2008 PIRSA continued its review into the fitness for purpose of drilling and workover rigs operating onshore in South Australia. These reviews focused on both the physical integrity of rig plant and equipment

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<sup>5</sup> <[www.pir.sa.gov.au](http://www.pir.sa.gov.au)> Go to Petroleum, Environment & Land Access, Environmental Register, Fitness for Purpose Assessments.

<sup>6</sup> Entitled 'Santos, Fitness for purpose report 2006 for compliance with the Petroleum Act 2000 South Australia'.

and the effectiveness of rig management and maintenance systems. The reviews included discussions with both licensees and their drilling contractors through office and field visits. PIRSA noted an increase in third party inspections of facilities organised by licensees and individual contractors. The third party inspection reports were analysed as part of PIRSA's reviews of drilling activities.

### 3.7 Annual reports

Under regulation 33, licensees are required to submit annual reports summarising the year's activities and declaring their level of compliance with the Petroleum Act and any relevant SEOs. The main purpose of this is to ensure licensees assess and review their performance regularly, and through this process proactively take corrective actions, where required, to rectify any identified deficiencies, and improve their performance on a continuous basis.

Should an annual report be deficient in any manner (i.e. not addressing regulation 33 appropriately, lacking essential information and detail, inappropriate content), PIRSA may request a resubmission of the report, and addendum to the report, clarification on the report's content or seek to invoke other enforcement action under PIRSA's compliance policy. PIRSA will continue to make such requests until it is satisfied with the detail and accuracy of the content, pursuant to the appropriate regulation.

All annual reports submitted to PIRSA under the Act are made publicly available on the Environmental Register. By making company performance a matter of public record, it is anticipated that appropriate compliant behaviour will be encouraged, as poor performance is subject to public scrutiny.

In 2008, a total of 92 annual reports (for single or multiple licences) were received by PIRSA. Of these, 64 annual reports have been reviewed for compliance with regulation 33 of the Petroleum Act and have been accepted by PIRSA. The remaining 28 reports are currently under review by PIRSA, to be completed in early 2009.

Table 3 shows the standard of annual report received by PIRSA at initial submission during 2008. Annual reports have been classified by:

- 1 the requirement to resubmit the report (denoting several to numerous major changes)
- 2 the requirement to submit an addendum to the report (addressing only minor issues)
- 3 the initial annual report is submitted in a suitable form.

**Table 3** Summary of quality of annual reports received by PIRSA during 2008

Types of reports	Acceptable	Addendum required	Re-submission required
Petroleum exploration licences	32	1	43
Petroleum production licences			
Petroleum retention licences			
Geothermal exploration licences			
Geothermal retention licences			
Petroleum licences	9	3	4
Preliminary survey licences			

### 3.8 Emergency response exercises

Another key component of the preventive measures is to ensure appropriate plans are in place for emergency incidents. Under the Petroleum Act, measures must, in particular, focus on the prevention of environmental, public safety and security of gas supply incidents. Regulation 31 requires that licensees maintain effective response procedures to be followed in the event of such emergencies. It also requires that

these plans be tested for their effectiveness at least once every two years, and that a report into the findings of the exercise be prepared and provided to PIRSA.

A number of emergency response drills were carried out in 2008 by Santos, Beach Petroleum, Stuart Petroleum, Epic Energy SA, APT O&M Services, SEA Gas and East Australian Pipeline Ltd (part of the APA Group). These included exercises relating to drilling, production and transmission pipeline operations, addressing the effectiveness of emergency response plans and procedures to potential:

- spill and fire incidents during typical tanker loading operations
- vehicle accidents
- uncontrolled gas releases during plant and well operations
- pipeline gas leaks resulting in loss and curtailment of gas supply to customers
- operating failures at facilities impacting on gas supply volumes
- pipeline damage incidents requiring repair strategies to be implemented
- serious injury to personnel operating single person remote facilities.

Emergency response drills conducted during 2008 included:

- A simulated incident of severe damage to the Moomba to Port Bonython liquids line (PL 2) caused when an excavator operator struck the buried pipeline during excavation work to detect and repair a coating defect. The objective of this emergency exercise was to test a new emergency response plan including new roles and responsibilities for personnel, communication processes, first on site preparedness and also repair procedures.
- Desktop simulation of Epic Energy's response to an incident in which a contractor hit the section of the South East Pipeline System (PLs 3 and 4) feeding Mount Gambier. The emergency response focused on testing the response team's understanding of their roles and responsibilities, first on site preparedness, notification processes and review of repair clamps.
- Desktop exercise designed to test the communication and teamwork of APA Group staff, and to test the emergency response plan developed for the Riverland and Berri to Mildura Pipelines (PLs 8 and 11 respectively). The exercise involved a simulated electrical failure at the Angaston Compressor, preventing compressor operation and impacting on the maximum amount of gas supply during the peak winter period.
- Desktop simulation and response planning for a gas leak detected by a landowner on the easement of the Moomba to Sydney gas and ethane pipelines (PLs 7 and 8 respectively). The simulated incident, conducted by East Australian Pipeline Ltd, was treated as a potential rupture incident requiring a reduction in pressure and subsequent threat to security of supply to New South Wales. The exercise tested the capability of the New South Wales team to manage a full response to a remote incident in South Australia.
- Emergency response to a progressively escalating incident simulation involving SEA Gas facilities located at the Iona gas hub in Victoria, which supplies the Iona to Adelaide Pipeline (PL 13). This exercise aimed at assessing emergency response and management protocols in conjunction with upstream asset operators and emergency critical stakeholders. The exercise focused on emergency response strategies, recovery and repair strategies, post-incident site accessibility and investigations by stakeholders.
- Simulation of an incident whereby a dark patch is identified on the Jackson to Moomba oil pipeline (PL 18) easement indicating a pipeline leak. The exercise tested Santos personnel as well as contractors in the areas of communication, command, control, coordination of resources and effectiveness of liaison procedures.
- Desktop simulation of Geodynamics' drilling Rig 100 medivac procedures. The exercise involved a simulated dropped block incident testing the emergency contact numbers and the effectiveness of evacuating injured personnel from the rig.

- Simulated technical fault in aircraft approaching the Moomba Gas Plant. This exercise considered all emergency response resources available and practised, developed and refined crisis management arrangements.
- Confined space rescue exercise aimed at practising and refining emergency management arrangements in the event of an incident. The exercise involved a rescue procedure and further treatment of the casualty.
- Simulated building fire requiring evacuation, testing camp occupants in evacuation procedures and requiring muster point controllers to practise muster point control procedures. This exercise also gave the fire fighting response team the opportunity to practise fire fighting skills (within the limitations of the simulated scenario).

Overall, PIRSA was satisfied that the response exercises carried out were of sufficient standard to address the effectiveness of the relevant emergency response procedures in accordance with the requirements of regulation 31.

### 3.9 Field inspections

On a regular basis during the year, as part of an ongoing field inspection program, PIRSA identified and targeted a number of key areas or themes to monitor compliance. In 2008 inspection activities covered geophysical operations, drilling operations, plant operations, pipeline operations, work site restoration activities, water disposal, oil spill management and truck transport<sup>7</sup>. Inspections carried out by PIRSA seek to ascertain the level of:

- *Effectiveness of licensee health, safety and environment management systems in meeting the requirements of the regulation 16 operator assessment factors.* For example, in 2008 PIRSA visited a number of drilling rigs with a focus on rig maintenance system effectiveness. PIRSA also visited a number of landowners through whose properties pipeline easements traverse, with a focus on assessing the effectiveness of licensee landowner communication and liaison procedures.
- *Compliance with the SEOs.* Monitoring compliance with the SEOs includes assessments of the effectiveness of rehabilitation of abandoned work sites (see [Goal Attainment Scaling](#) on the PIRSA website<sup>8</sup>). In most cases, inspections revealed that adequate compliance with relevant SEOs was achieved, while all detected breaches were of minor nature and promptly rectified, by the responsible licensee, to PIRSA's satisfaction.

#### 3.9.1 Wellsite inspections

PIRSA inspects restored wellsites and access tracks in the South Australian sector of the Cooper Basin to assess the level of compliance achieved against relevant restoration objectives. Figure 5 shows goal attainment scores of all inspection results over the term 1993 to 2008. The criteria used to assess against these objectives are detailed in the PIRSA '[Field guide for the environmental assessment of abandoned petroleum wellsites in the Cooper Basin, South Australia](#)' (available on PIRSA's website<sup>9</sup>). Restored wellsites and their associated access tracks are assessed against two key objectives: 'minimisation of visual impact' and 're-establishment of indigenous vegetation'. In the case of the latter, due to the time and rainfall dependency of achieving revegetation, the sites are inspected against two sets of criteria — a time frame for less than five years since the completion of the restoration work, and a time frame for greater than five years.

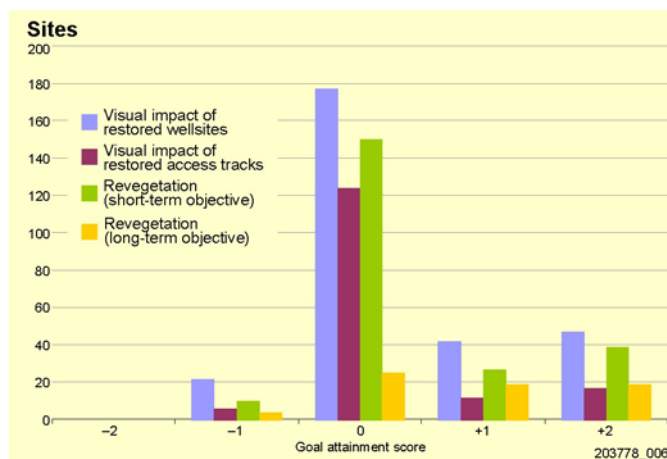
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7 Inspection of road transport operations was coordinated with the South Australia Police, with the police taking the lead role.

8 <[www.pir.sa.gov.au](http://www.pir.sa.gov.au)> Go to Petroleum, Legislation & Compliance, Environmental Regulation, Goal Attainment Scaling.

9 <[www.pir.sa.gov.au](http://www.pir.sa.gov.au)> Go to Petroleum, Legislation & Compliance, Environmental Regulation, Goal Attainment Scaling, Field Guides.

In summary, scores of –2 and –1 represent unacceptable restoration outcomes as observed and assessed against the criteria, whereas 0, +1 and +2 represent acceptable outcomes expected at various time frames since the completion of the restoration work on the wellsites and access tracks. The inspection results to date show that, in general, wellsite and access track restoration activities have been successful in attaining desired restoration objectives.



**Figure 5** Compliance of wellsite and access track restoration activities, 1993 to 2008.

In the case of the revegetation objective, the –1 scores were a result of past restoration practices (now discontinued) where sites were not ripped to facilitate revegetation. In all these cases it is expected that the impacts will naturally remediate, however, over a longer period of time than if current restoration practices were adopted at the time. In the case of visual impact objectives, the goal attainment score of –1 was a result of past practices (no longer utilised) where excessive foreign material was brought in to construct access tracks and wellsites. In many cases the colour of such material has resulted in a visual impact in contrast to the surrounding soil.

PIRSA will continue to monitor and goal attainment score rehabilitated wellsites in 2009.

### 3.9.2 Geophysical operation inspections

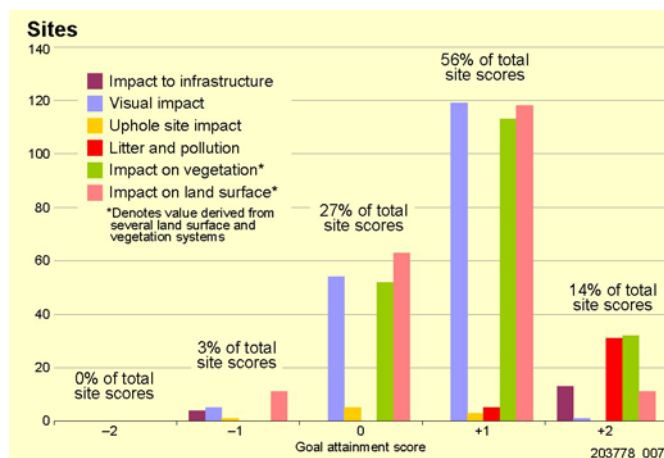
Goal attainment scores from field inspections of geophysical operations conducted in 2008 are shown in Figure 6. These inspections are an assessment of the condition of recently abandoned seismic lines in the Cooper, Eromanga and Arckaringa basins. The assessment, in effect, measures the degree to which objectives set for line preparation (the process of greatest potential impact), survey operations and restoration, as included in the relevant SEOs, have been met.

The goal attainment score criteria used for assessing seismic lines are provided in the relevant SEO and PIRSA's 'Field guide for the environmental assessment of recently completed seismic lines in the Cooper Basin, South Australia', September 2006 (available on PIRSA's website<sup>10</sup>).

Six areas of impact are usually assessed, with 'visual impact', 'impact on vegetation' and 'impact on land surface' the key indicators of whether operators are meeting their environmental obligations in line preparation. The distribution of scores presented in Figure 6 highlights the attainment of a desirable outcome (scores of 0, +1 and +2) in over 90% of recorded observations. This is an excellent outcome for operator

<sup>10</sup> <[www.pir.sa.gov.au](http://www.pir.sa.gov.au)> Go to Petroleum, Legislation & Compliance, Environmental Regulation, Goal Attainment Scaling, Field Guides.

compliance with regulatory objectives and community expectations. Furthermore, with over 90% of goal attainment scores recorded in the desirable range, the expectation that these seismic lines will recover to the level of natural variability in the landscape in the short to medium term is likely to be realised.



**Figure 6** Compliance of seismic line preparation activities with the relevant SEO in 2008.

### 3.9.3 Significant geophysical operation inspection activities

Officer Basin Energy Pty Ltd's first seismic program in Petroleum Exploration Licences (PELs) 81 and 253 in the early part of 2008 and their second program in December 2008 were the focus of geophysical operation inspections during the year. These surveys were undertaken in a frontier province with minimal existing infrastructure. The Ahava Energy seismic program in PEL 139 was also a focus of geophysical operations inspections in the second half of the year. As both companies have limited experience operating under the Petroleum Act, extensive on-ground and aerial monitoring was deemed to be required. The monitoring process has enabled interactive feedback to be provided to the operators on achievement of objectives under the SEO, validation of the SEO controls and development of goal attainment criteria, particularly for the Officer Basin Energy surveys.

Other inspections conducted in the Cooper Basin identified that licence operators undertaking geophysical field operations during 2008 continued to exhibit an excellent culture of compliance. PIRSA inspections focused on operations conducted in sensitive areas, such as Cooper Creek Heritage Area and operations on salt lakes.

### 3.10 Geophysical operator audit reports

To conform to the requirements of the appropriate SEO, three environmental audit reports for geophysical survey field operations were submitted to PIRSA. Remaining environmental audit reports are due for submission in 2009.

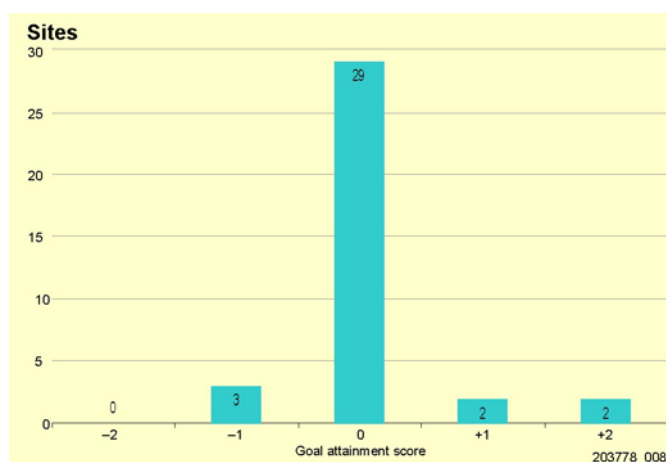
### 3.11 Legacy issues

Santos and its joint venture partners, as licensees of the now expired PELs 5 and 6, have set aside funds to offset the residual environmental effects of their seismic exploration activities in the Merninie Range, to the north of Innamincka. The funds are administered under a formal deed of arrangement between Santos and the Minister for Mineral Resources Development, and are dedicated for projects that are to provide a tangible benefit to the environmental assets of the Innamincka Regional Reserve. The Department for Environment and Heritage, as the manager of the Innamincka Regional Reserve, has nominated a series of projects within the reserve that fit the requirements contained in the deed of arrangement.

A feral animal control project costing ~\$20 000 was conducted during May 2008. A cultural heritage clearance with the relevant native title claimants was also conducted. Further projects are in planning stage, with on-ground work and flora and fauna surveys scheduled to commence in 2009.

### 3.12 Water disposal facility inspections

In the South Australian sector of the Cooper Basin, co-produced water is disposed of through evaporation and seepage ponds, operation of which is covered by SEOs. Figure 7 shows goal attainment scores of all inspection results carried out during 2007 and 2008 of water disposal ponds in the South Australian sector of the Cooper Basin against SEO objectives. The criteria used for visual assessment of these ponds are detailed in Appendix 5 of the 'South Australia Cooper Basin Operators statement of environmental objectives: production and processing', October 2003 (available on PIRSA's website<sup>11</sup>). Over 90% of the sites inspected are compliant, with the noncompliances (–1) detected relating to visible oil detected on intermediate holding ponds. This was caused by temporary process upsets in the water separating facility/operation. As this oil was confined to the holding ponds and had not discharged into the open area evaporation / seepage area of the pond system any serious environmental harm was mitigated.

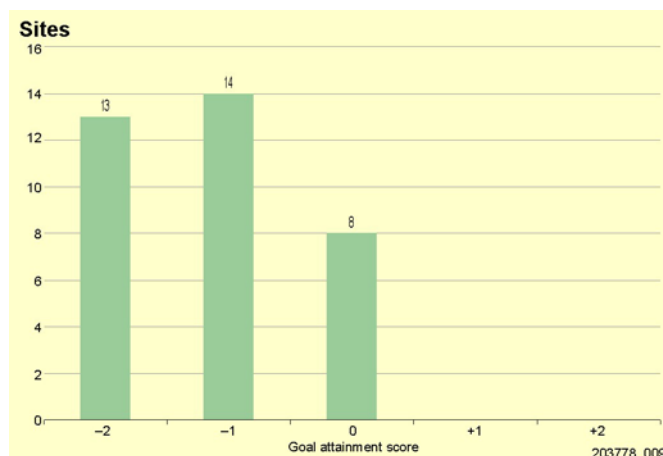


**Figure 7** Compliance of water disposal facilities in the Cooper Basin, 2007 to 2008.

### 3.13 Borrow pit inspections

In the South Australian sector of the Cooper Basin, material used for the construction of roads, wellsites and any other site for the exploration and production of regulated resources is often extracted from pits — known as borrow pits — within close proximity of the proposed work sites. Borrow pit locations are reported to PIRSA as part of all activity notifications (where relevant) and are entered in a database for future monitoring against SEO goal attainment score criteria to ensure appropriate rehabilitation. The current results of borrow pit inspections have shown poor performance against the relevant SEO requirements (Fig. 8) and PIRSA will continue to focus on this area as part of its regulatory priorities in 2009.

<sup>11</sup> <[www.pir.sa.gov.au](http://www.pir.sa.gov.au)> Go to Petroleum, Environment & Land Access, Environmental Register, SEO, EIR and ESA Reports, Production and Processing Activity Reports, Cooper Basin, South Australian Cooper Basin Joint Venture.



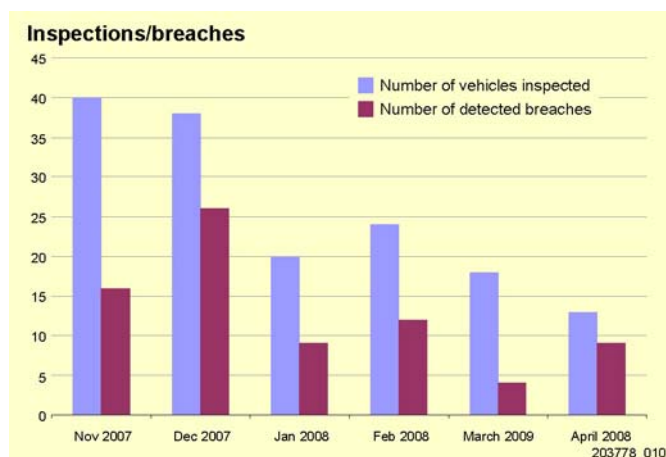
**Figure 8** Compliance of borrow pits in the Cooper Basin in 2008.

### 3.14 Road transport safety compliance

In accordance with the Petroleum Act’s public safety protection objective, PIRSA maintains a regulatory focus on public safety risks associated with various regulated activities. One such risk relates to road transport of heavy equipment, such as drilling rigs and crude oil tankers, on public roads. A key strategy adopted by PIRSA in facilitating compliance with this objective is through a collaborative initiative with the South Australia Police (SAPOL) and the Road Transport Division within the Department for Transport, Energy and Infrastructure (DTEI). Through this approach the industry is educated on the road transport regulatory requirements with respect to transporting oversize and heavy loads and is informed through PIRSA on SAPOL–DTEI detected road transport breaches.

During early 2008 monthly compliance statistics collected through SAPOL and DTEI heavy vehicle surveillance activities in the Cooper Basin region were provided to PIRSA to seek assistance to resolve detected heavy vehicle breaches relating to petroleum and geothermal activities. This inspection program was suspended in May 2008 due to operational constraints, but is expected to recommence in early 2009.

The number of total monthly breaches with road transport regulations and vehicle permit conditions detected by SAPOL and/or DTEI for all heavy vehicles inspected in the Cooper Basin area during late 2007 through to April 2008 are shown in Figure 9. The results show a demonstrable improvement compared to trends indicated in 2007 (see 2007 compliance report). It is believed that this improvement is largely attributable to the increased surveillance and reporting of contractor breaches to respective licensees, used by licensees to enforce contractual conditions on transport companies to ensure vehicle compliance with all road regulations and permits.



**Figure 9** Compliance of heavy vehicles in the Cooper Basin from November 2007 to April 2008.

### 3.15 Education and support initiatives

A key component to any preventive measure is the need for regulators to effectively educate and advise industry on regulatory requirements to support their efforts in achieving compliance. An effective means for providing such education and support initiatives is through various regulatory and industry forums where PIRSA's regulatory requirements and philosophy can be communicated effectively and efficiently to industry representatives and other stakeholders. Initiatives undertaken in 2008 included:

- Continuing to present at public meetings convened by PIRSA and the Natural Resources Management boards/groups. PIRSA presented at Beltana to inform landowners of licensees' obligations under the Petroleum Act in relation to environmental protection and landowner notification provisions. Landowners were also informed of their rights under the Act in terms of negotiating access arrangements with the licensee and compensation for any deprivation of use of their land resulting from a licensee's activities.
- Continued involvement in the Standards Australia ME38 committee responsible for the review and update of the Australian Standard AS 2885 for gas and liquid petroleum pipelines. PIRSA contributed to the revision process for Part 3 of the Standard regarding pipeline operation and maintenance. PIRSA was also involved in a strategic planning session for the Australian Pipeline Industry Association which addressed future challenges facing the pipeline industry.
- Continued regular attendance at industry forums at a national level including drill-safe forums, AELERT Conference, APPEA Safety Conference, APPEA Environmental Conference and Cooper Basin wellsite forums. These forums provide an opportunity to promote the objective-based legislation and regulatory framework administered in South Australia as well as an opportunity to interact with industry and interstate regulatory professionals to discuss issues affecting the industry.
- Provision of technical compliance assistance to interstate jurisdictions. This assists both regulators and industry in providing consistent expectations across jurisdictions.

### 3.16 Data compliance

The Petroleum Act requires explorers and producers to provide PIRSA with geotechnical and ancillary data relevant to their operations. The data requirements are specified in the Regulations. The data becomes a future asset for the state and is used to assist future explorers in investment opportunities. Guidelines for the format, timing and content of the data have been developed by PIRSA to assist companies comply with these requirements. Some guidelines are particularly detailed due to the highly sophisticated and complex nature of the data involved in the petroleum and geothermal industry and many companies find it a challenge to meet them in the first instance. PIRSA provides considerable assistance to new explorers in attempting to

meet the guidelines. This assists in developing capacity to comply in the future, as well as facilitating the collation of statewide assets for future use.

## 4 SERIOUS INCIDENTS

Section 85 of the Petroleum Act defines a serious incident as an incident arising from activities conducted under a licence in which:

- (a) a person is seriously injured or killed
- (b) an imminent risk to public health or safety arises
- (c) serious environmental damage occurs or an imminent risk of serious environmental damage arises
- (d) security of natural gas supply is prejudiced or an imminent risk of prejudice to security of natural gas supply arises.

Furthermore, pursuant to regulation 12, more specific definitions of events which constitute a serious incident under the broad definition in section 85 are provided in respective SEOs.

Any serious incident must be reported to PIRSA immediately and then followed up by a detailed report explaining the root cause and corrective actions taken to prevent its re-occurrence. The Act requires licensees to take appropriate action to ensure that any long-term damage is avoided (i.e. breach to relevant SEO), and that adequate corrective action is taken to minimise the likelihood of the re-occurrence of such an incident. Therefore one of the purposes of requiring licensees to prepare and submit detailed reports into the cause of such incidents, and the proposed corrective actions to prevent their reoccurrence, is to ascertain whether a breach has occurred and warrants further enforcement action.

During 2008 the following serious incidents were reported:

- *Drilling rig PDI 709 fatality, 27 January.* On 27 January 2008 a fatality occurred on drilling rig PDI 709 (now operating as WDI 709) while contracted to Santos for drilling Mudera 12 in the Cooper Basin. The investigation into the incident is being led by SafeWork SA, with PIRSA assisting through providing technical advice on drilling rig matters. SafeWork SA investigations into this incident at the time of the writing of this report were continuing.
- *Moomba Plant gas supply outage, 8 July.* At ~11 am on 8 July 2008 the Moomba Plant experienced a gas supply outage. This was caused by a significant loss of plant steam generating capacity, resulting primarily from a major boiler trip. Gas supply was restored on 10 July, with stable and normal plant operation re-established by 13 July. Major causal factors contributing to this outage incident have since been responded to by Santos to the satisfaction of PIRSA. They related to maintenance scheduling of boilers and improvements to the reliability and maintenance of boiler-forced draught fan operations.
- *Moomba Plant gas supply outage, 10 August.* At ~1.30 pm on 10 August 2008 the Moomba Plant experienced a gas supply outage caused by a major boiler trip. Normal plant operation was re-established by 13 August. The loss of plant steam production, caused by an incorrect overpressure reading in the high-pressure steam header by the boiler control system, was the direct cause of the outage. This incorrect reading in turn reduced the steam load from each boiler, as expected for safety reasons. Major causal factors of this outage have since been responded to by the operator to PIRSA's satisfaction. They related to a faulty pressure transmitter and incorrect pressure and boiler load controller configuration.
- *Moomba Plant gas supply outage, 18 August.* At 1 pm on 18 August 2008 gas supply from the Moomba Plant into the Adelaide and Sydney pipelines ceased as a result of a detected gas leak in the main sales gas line immediately upstream from the Adelaide (MAP) and Sydney (MSP) pipelines' flow control valves. The Moomba Plant was placed into circulation mode (not shut down) while the pipeline leak was repaired. This allowed sales gas to be re-introduced into the MAP and MSP as soon as the leak was repaired, which was within 24 hours of detection. The leak was a result of a crack on a weld connecting a small bore gas sampling line to the sales gas line. The major causal factors have since been responded to by

the operator to PIRSA's satisfaction. They related to excessive vibration caused by increased pressure drop across the MSP flow control valve.

- *Whyalla gas outage, 16 May.* On 16 May 2008 a significant flow restriction occurred at the Epic Energy Whyalla township meter station. This flow restriction led to a decision at ~5 pm on 16 May by the operator of Whyalla township gas distribution system (Envestra) to cease supply to the township. By 6 pm on 18 May 2008 gas supply to the township was restored. Direct cause of the flow restriction from the meter station was a blockage at a conical piping reducer downstream from the sales gas meter. The blockage was caused when shattered material from the diaphragm meter swept downstream, accumulating in the piping reducer. Corrective actions taken to reduce the likelihood of a re-occurrence of such an incident included cessation of the use of diaphragm meters for township supply applications and measures to improve emergency response to gas supply incidents.
- *Cultural heritage site disturbance, Jackson to Moomba Pipeline.* On 28 January 2008 clear and grade activities carried out by a pipeline construction company contracted to Santos on the South Australian section of the Jackson to Moomba oil pipeline right-of-way resulted in a disturbance to cultural heritage sites identified earlier by the Yandruwandha and Yawarrawarrka (YY) People. In response, Santos put an immediate directive to all key Santos and contractor field- and office-based personnel to cease all clear and grade activities on the South Australian section of the pipeline right-of-way until this matter was investigated and resolved. The YY legal representative, Chairman of the YY Committee and consultant archaeologist were consulted and engaged in the investigation by Santos. In response to the causal factors leading to this incident, the corrective actions taken to reduce the likelihood of a re-occurrence of such an incident include: improvements to marking identified sites; communication protocols across all parties on such issues, including drawings identifying cultural heritage exclusion zones and communicating status of heritage clearance approvals; contractor procedures and checklists; and field supervision protocols.
- *Cultural heritage disturbance, Callawonga West evaporation area.* During the last week of July 2008 earth works carried out by contractors on behalf of Beach Petroleum at the Callawonga West evaporation area disturbed an area that was identified as an exclusion zone from a work area clearance carried out by the Dieri People. The Dieri People were consulted in the investigation and in response to the causal factors identified a number of improvements to the induction and training requirements for contractors and employees. Work instructions were implemented to minimise the likelihood of a re-occurrence of such an incident.

## 5 PERSUASIVE MEASURES

In the case where noncompliance with the Petroleum Act or reportable or serious incidents are not responded to appropriately by the licensee, Step 2 persuasive measures on the compliance and enforcement pyramid (Fig. 1) is triggered. The purpose of such measures is to instigate urgent corrective action from the licensee through formal expression of concern from the regulator regarding the licensee's compliance and the threat of more punitive action.

In 2008 there were six Step 2 cases relating to the following incidents:

- *Stuart Petroleum — construction and operation of Dunoon 2 and Might and Power 1 flowlines and Harpoono Facility modification without approval.* On 19 September 2008 PIRSA became aware that Stuart Petroleum had commenced extended production testing on the Dunoon 2 and Might and Power 1 wells (PEL 113) beyond the maximum test period and without relevant approvals under the Petroleum Act. Stuart Petroleum also commenced extended production testing activities without obtaining approval for the operation of flowlines from these wells to the Harpoono Facility and for the operation of the modified Harpoono production facility. Stuart Petroleum was issued a formal letter (Step 2) of noncompliance on 7 October. As a result Stuart Petroleum submitted compliant notification and in turn this noncompliance was resolved leading to the granting of PIRSA approval on 13 October.

- *Victoria Petroleum NL (Victoria Oil Exploration (1977) Pty Ltd) — Tigershark 1 abandonment noncompliance.* Victoria Petroleum was noncompliant with the 'South Australian Cooper Basin drilling and well operations SEO' (November 2003) during the abandonment of Tigershark 1 (PEL 104) by not setting a plug isolating the Birkhead–Hutton–Poolowanna units from the basement (Warburton Basin). PIRSA issued a letter of noncompliance on 21 November. Victoria Petroleum provided an adequate response and demonstrated that the risk of crossflow from the basement is negligible.
- *Innamincka Petroleum Limited — extended production testing activities without approval.* In January 2008 Innamincka Petroleum inadvertently extended production testing on Flax 3 and 4 wells beyond the 10-day maximum initial production testing period without relevant approval under the Petroleum Act. Upon becoming aware of this breach the company immediately suspended all testing activities. PIRSA immediately issued a formal noncompliance letter on 23 January requesting Innamincka Petroleum submit a compliant notification for PIRSA approval prior to re-commencing these testing activities. As a result this noncompliance was resolved leading to the granting of PIRSA approval on 30 July and corrective actions were implemented by Innamincka Petroleum to PIRSA's satisfaction to avoid a repeat of such a regulatory breach.
- *Santos — PDI rig 709 fatality incident report.* The report into Santos's investigation into the PDI 709 fatality incident on 27 January 2008 (submitted to PIRSA on 5 May 2008) was found to be deficient in satisfying the requirements for serious incident reports under the Petroleum Act. Failing to resolve these deficiencies through discussions with Santos, PIRSA issued Santos with a formal letter of noncompliance on 7 May 2008 advising Santos of the report's deficiencies and that any further appropriate action will be considered subject to the final findings of SafeWork SA's investigation into the incident. At the time of writing this report SafeWork SA's investigation had not been completed.
- *Santos — cultural heritage disturbance, Jackson to Moomba Pipeline.* PIRSA issued Santos with a formal noncompliance on 21 February 2008 regarding the lateness of the initial reporting of the incident (occurred 28 January, first reported to PIRSA on 15 February). PIRSA requested Santos to make necessary improvements to its regulatory reporting procedures. Notwithstanding this breach, in light of Santos's immediate and appropriate actions post the incident, including ceasing all clear and grade activities on the right of way and entering into immediate communication with the Yandruwandha and Yawarrawarrka People to identify and resolve their concerns, PIRSA considered that no other enforcement action was necessary.
- *Eagle Bay Resources — failure to furnish an annual report to the minister, pursuant to regulation 33, for PEL 182.* On 11 February 2008 PIRSA provided an informal warning to Eagle Bay Resources that the licence annual report was overdue by 19 days. No report had been received after seven weeks from the issue of this warning. As a result, PIRSA issued a formal notice of noncompliance, requesting a commitment to submit the annual report within 20 days. The licensee met this request.

## 6 COMPULSIVE MEASURES

In the case where Step 2 persuasive measures fail to deliver the required compliant behaviour, or where it is decided the offence is serious enough to warrant proceeding to Step 3 compulsive measures immediately, ministerial directions or prohibitions under the Petroleum Act are available. In 2008 the following two Step 3 directions were issued:

- *Santos, drilling rig PDI 709 fatality incident, 27 January.* On 29 January PIRSA issued Santos with a formal direction to not recommence any drilling operations with PDI Rig 709 until it was demonstrated to the satisfaction of both PIRSA and SafeWork SA that all hazards on the rig which posed serious safety risks were being managed to be as low as reasonably practicable (ALARP). This direction was lifted on 26 February in response to Santos and the drilling contractor having demonstrated that appropriate measures were put in place to manage all serious safety risks on the rig to ALARP.
- *Santos, cultural heritage disturbance, Jackson to Moomba Pipeline.* On 21 February PIRSA issued Santos with a direction to cease all clear and grade activities on the South Australian section of the Jackson to

Moomba Pipeline right of way. The direction was lifted on 6 March after it was demonstrated that any concerns of the Yandruwandha and Yawarrawarrka People as a result of this incident were addressed to their satisfaction.

## 7 PUNITIVE MEASURES

As a final measure, for extreme cases where noncompliant behaviour cannot be dealt with effectively through Steps 2 and 3, prosecution and ultimate licence cancellation measures are available. To date no such measures have been required to ensure compliance.

## 8 COMPLIANCE STATISTICS

The following graphs provide a snapshot of the upstream petroleum and geothermal industries' performance in terms of incidents (both reportable and serious) and the findings of the root cause analysis into these incidents.

For all incidents in 2008, the licensee responses and preventive corrective actions satisfied the Petroleum Act's and PIRSA's requirements.

### 8.1 Spill incidents

All incidents involving the uncontrolled release of hydrocarbon or other contaminants (including produced water) into or onto an area that has not been designed for the specific purpose of containing such a release, are deemed to be spills, regardless of the volume released. For example, if a tank containing oil ruptures and the contents released are contained inside the impervious bunded area surrounding the tank (installed to prevent environmental damage), this is not deemed a spill and hence is not required to be reported as a spill. On the other hand, in the case of a similar incident where a portion of the oil overflows the bund, then this is deemed a spill and must be reported in accordance with the regulatory requirements. Spill incidents are reported and monitored due to their potential environmental risks, such as pollution and contamination of water and soil, the degradation of vegetation and/or the productive capacity of the land affected.

Figure 10 is a graph of all spills reported since 2001 to end 2008 for the onshore petroleum and geothermal industries in South Australia. The graph shows the portion of these spills that are oil as opposed to other contaminants. The relative frequency of types of fluids spilled in 2008 is shown in Figure 11.

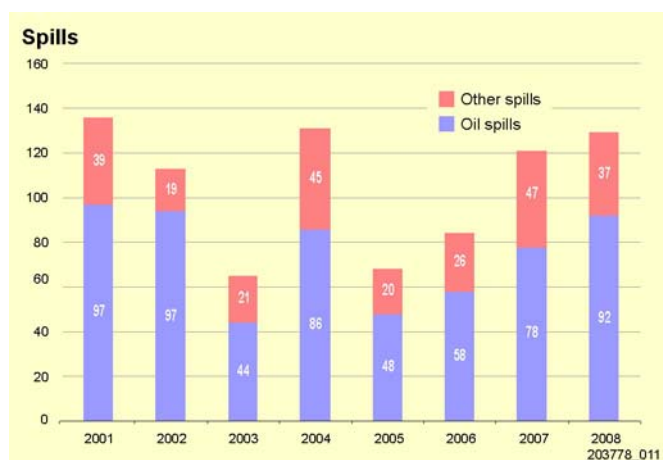


Figure 10 Annual regulated substance spills, 2001–08.

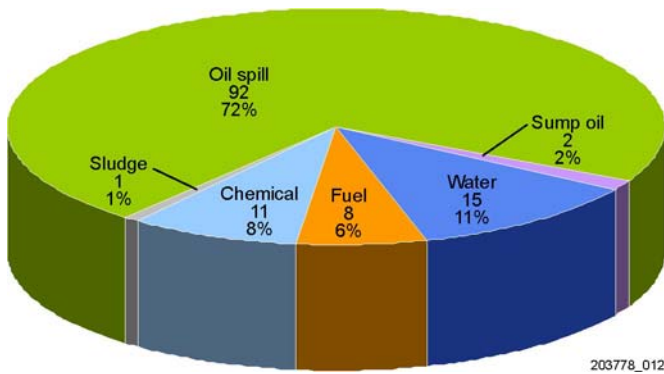


Figure 11 Categories of regulated substance spills in 2008.

The number of spill incidents shown in Figure 10 needs to be considered in the context of the severity (in terms of environmental consequence of the spills, and the volume of oil spilled). Figure 12 shows that the oil spilled expressed as a percentage of total oil production is small and trending lower, from ~0.18% (805 m<sup>3</sup>) in 2001 to <0.01% (26 m<sup>3</sup>) in 2008. The relatively higher percentages in 2001 and 2002 represent two major spill incidents that occurred in those years — a pipeline leak in 2001 released 500 m<sup>3</sup> (more than half the total volume spilled in that year) and a breach in an oil interceptor pond wall in 2002 released 200 m<sup>3</sup> of oil (again more than half the total spill volume for that year). Between 2001 and 2008 only one incident (the 2001 pipeline leak of 500 m<sup>3</sup>) was deemed as having the potential to cause serious environmental harm and was hence treated as a serious incident under the Petroleum Act. Other than the 2001 spill, notwithstanding that the reported oil spills have been found to be of low environmental consequence, the industry has continued to implement and improve the effectiveness of industry’s oil spill prevention and management plans. This is reflected in the generally decreasing trend shown in Figure 12.

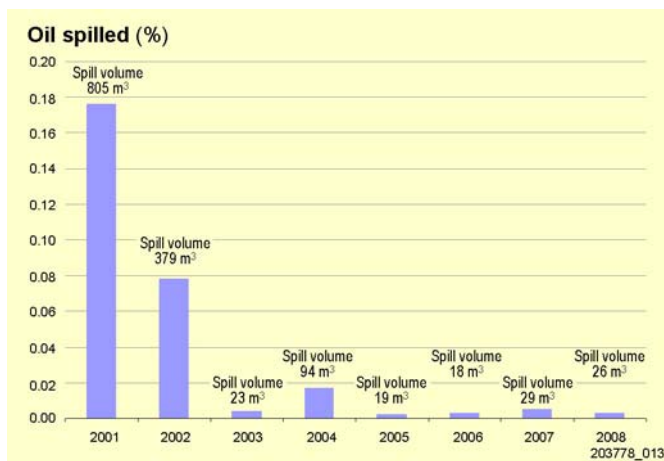
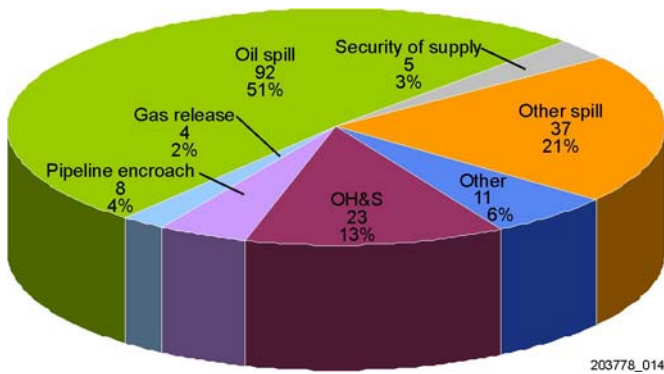


Figure 12 Percentage of volume of oil spilled to total oil produced, 2001–08.

## 8.2 Other incidents

The Petroleum Act includes objectives pertaining to public safety, security of supply and the protection of interests of other land users and landowners. Therefore any incident that may impact on compliance with these objectives must be reported to PIRSA. Figure 13 gives a breakdown of all incidents reported to PIRSA for the year 2008 into the various categories.



**Figure 13** Categories of incidents in 2008.

### 8.2.1 Oil and other spills

As has been the case in other years, the majority of spill incidents relate to oil and other substance spills (72% in 2008) rather than other substance spills. In terms of severity, these have been low consequence events.

### 8.2.2 Security of supply

Security of supply incidents relate to gas processing facility or gas transmission pipeline incidents which have resulted in sufficiently long outage to warrant concern regarding a potential for interruption or restrictions to gas supply. As detailed in Section 4, four out of the five security of supply incidents (3%) constituted potentially more serious consequence and hence were given considerable regulatory scrutiny and attention.

### 8.2.3 Pipeline encroachment

Pipeline encroachment incidents include detected unauthorised third party entry or activity on pipeline easements. Such incidents are taken seriously by pipeline companies because they often indicate a failure of the systems to pick up unauthorised encroachments and activities on the easement. Notwithstanding that, the eight incidents reported during 2008 were of immaterial harm and of low risk. The need to avoid unauthorised activity is of paramount importance to safeguard the pipeline against any potential threats to its integrity and hence the extent of any unauthorised activity needs to be monitored and mitigated against accordingly. Pipeline companies seek to achieve this through various initiatives such as landowner easement access agreements, warning signs along the pipeline easement, regular landholder liaison programs, and the use of the 'dial before you dig' service.

### 8.2.4 Gas release

Gas release incidents relate to uncontrolled and unintended gas releases at processing facilities and pipelines. Such incidents may be indications of equipment integrity issues that may have security of supply and/or safety implications. In the case of the four incidents reported during 2008 none were of sufficient seriousness to warrant concern and further investigation by PIRSA.

### 8.2.5 OHS&W

OHS&W incidents include 'slips, trips and falls', near misses and dangerous occurrence type incidents, minor injuries, and in the rare case serious injuries and fatalities such as the PDI Rig 709 incident on January 2008 as reported in Section 4. Such incidents are strictly occupational health and safety legislation incidents administered by SafeWork SA (SWSA). However PIRSA, through an agreement with SWSA, is also copied on such incident reports by the licensees to assist in close working cooperation with SWSA to maintain and

promote the one-stop shop to government for the industry. In the case of OHS&W incidents, PIRSA engages with SWSA in the consideration of whether any further regulatory attention or investigation is required. For example, in the case of the January 2008 drilling rig fatality incident, PIRSA and SWSA coordinated the regulatory response where SWSA took the lead investigation role with PIRSA providing drilling rig technical advice.

#### 8.2.6 Other

Other incidents relate to all other incidents not specific to the other categories but which have the potential to adversely affect the environment and third parties (workforce, public and landowners) if left unattended. For example, landowner complaints, road incidents and heritage disturbance incidents.

### 8.3 Root cause analysis

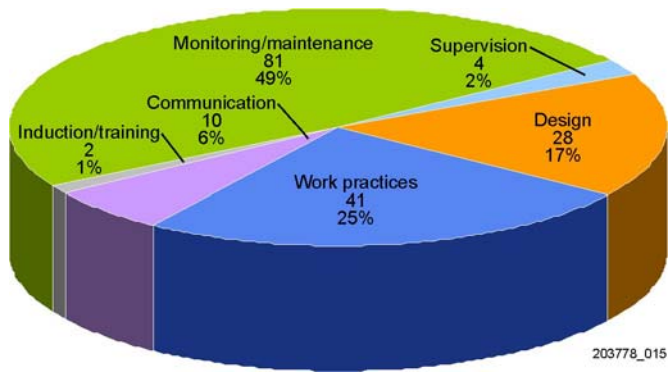
As highlighted earlier, through regulation 16 operator assessment factors, the PIRSA focus is on licensees' capabilities to achieve SEO compliance in terms of personnel competency, fit-for-purpose equipment and management system effectiveness. Consistent with this approach, PIRSA requires the investigation of the cause of all incidents by licensees to be analysed in these terms. To this end, PIRSA has recommended to licensees the adoption of the following causal factor definitions when analysing the primary contributors to the cause of incidents (see [Incident Reporting](#) on PIRSA's website<sup>12</sup>):

- *Design*. The suitability and fitness for purpose of the equipment utilised in the activity.
- *Monitoring/maintenance*. Inadequate monitoring of, and preventive maintenance on, the equipment utilised in the activity.
- *Work practices*. Unclear, incorrectly used, or the absence altogether of, written procedures.
- *Communication*. Absence of, or error in, communication between personnel performing the activity.
- *Supervision*. Absence of, or inadequate support, oversight or supervision of, those carrying out the activity by the person in charge (supervisor).
- *Risk management*. Inadequacy of the risk review or assessment of the activity (e.g. job hazard analysis (JHA), permit to work (PTW), hazard analysis (HAZAN) / hazard and operability (HAZOP)) carried out prior to the activity.
- *Induction/training*. Appropriateness of training, skills and/or induction of the personnel carrying out the activity.

Figure 14 summarises the root cause analysis of reported incidents during 2008. These findings show that the majority of incidents in 2008, like in 2007, continue to be a result of deficiencies in the monitoring and maintenance of equipment. Also, as was the case in 2007, the majority of incidents, other than those which resulted in serious incidents, continue to be of low environmental consequence and hence have not warranted any urgent remedial action to totally eliminate their re-occurrence. PIRSA is satisfied that the level of corrective action to such incidents is appropriate and PIRSA continues to monitor the progress of such corrective actions at quarterly compliance meetings with the relevant licensees. Furthermore, the outcome of these root cause analysis findings will continue to influence PIRSA's inspection activities in 2009, in particular PIRSA's scrutiny of licensee fitness-for-purpose reviews and audits.

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12 <[www.pir.sa.gov.au](http://www.pir.sa.gov.au)> Go to Petroleum, Legislation & Compliance, Guidelines, Incident Reporting.



**Figure 14** Summary of root causes of incidents in 2008