

# Responding to Montara and Macondo

## *Actions by Australia's oil and gas industry*

International Regulators  
Offshore Safety  
Conference

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# Montara Incident - 21 August 2009

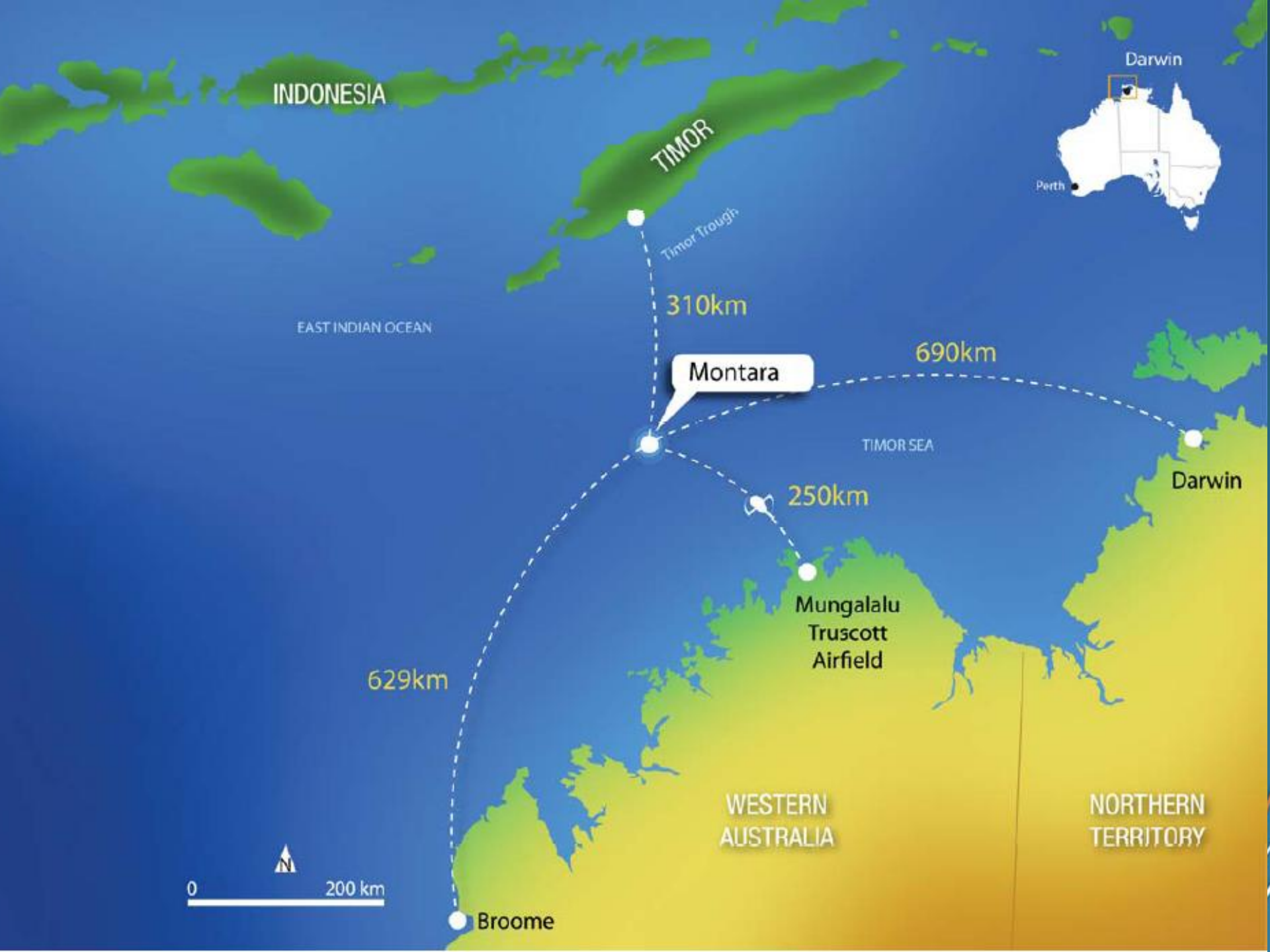


# Incident Timeline

- ≈ 7 March 2009 - failed cement shoe unnoticed
- ≈ 21 August 2009 - well kick, uncontrolled flow of oil, gas and condensate
- ≈ 1 November 2009 - relief well intercept, fire on WHP, oil flow into ocean stopped
- ≈ 3 November 2009 - “well kill”

Common to both Montara and Macondo incidents was that drilling risks were not identified and managed holistically.





# The Montara Incident Root Causes

## Commission of Inquiry Findings

### 1. Failure to maintain two well barriers

- eg. cement shoe was compromised and one PCCC was not installed.

### 2. No verification of barriers

- well filled with seawater

### 3. Poor management of change

- Process with poor governance structure

### 4. Limited Competency

- Personnel and contractors did not have appropriate levels and no systems were in place to uncover it.

# History of Offshore Well Blowouts in Australia



# Australian Oil and Gas Industry's Response

- Strong and immediate action by industry - pulled together to provide peer review, specialist personnel and support to seal off the well blowout.
- Important to note that the emergency response to Montara at the time worked well, and saw 67 people evacuated without physical harm.
- APPEA's members have since carried out in depth reviews of design, integrity and operations of all their wells, their communication and verification protocols and emergency response preparedness.

# Collaborative Industry Actions





# Cross Industry Collaboration

≡ Collaborative efforts of the Australian industry have focused on two areas:

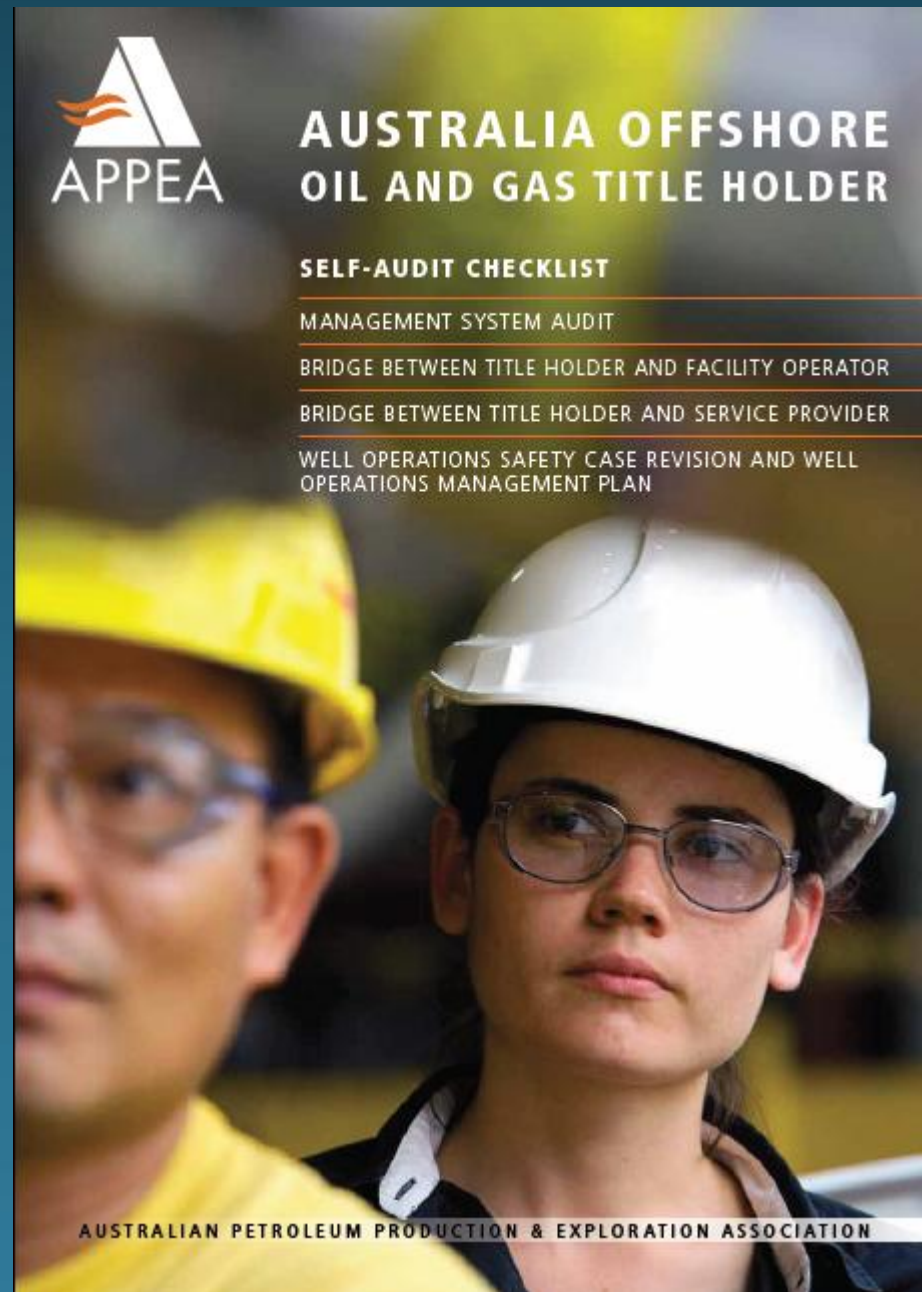
1. minimising the risk of these incidents occurring again; and
2. ensuring that we have the capacity to respond effectively and rapidly.

# Australian Industry Actions

1. A new self-audit tool to guide integrating permit holders' and contractors' well operations.
2. A Memorandum of Understanding on Mutual Aid for responding to offshore well incidents;
3. A commitment to designing and constructing a well capping solution for Australian conditions;
4. Increasing collaboration within the drilling industry;
5. Expanding the Australian petroleum industry spill response capability including through AMOSC.
6. Continuing to work closely with OGP's Well Expert Committee on international recommendations.

## The Self -Audit Checklist

- The Montara Inquiry Report identified the importance of effective and verified communication between the title holder and their contractors.
- Critical areas include planning, preparing and executing well activities, and emphasising the title holder has primary responsibility for well operations.
- The Australian industry has developed a self-audit tool to be used to assess/audit title holder's management system; and clarify responsibilities between the title holder and the facility operator.



# The Self Audit Tool Components

## Operational and safety management systems

- ☐ Description and exchange of each organisation's safety management systems, including but not limited to health, safety and environment (HSE) management, delivery processes, and technical validation of safety critical elements has occurred.
- ☐ Organisation description including decision hierarchy, decision escalation, nominated person in charge of well activities and change management and accountability/responsibility descriptions has been discussed and agreed.
- ☐ Job descriptions have been exchanged between the organisations for HSE-critical positions.
- ☐ The validation process (technical authorisation) for critical decisions has been agreed and communicated. This is not meant to imply that the facility operator has approval over or liability for all well design, construction and integrity issues. It just means that if contentious issues arise, there is a process in place for resolution.
- ☐ Appropriate representatives from both organisations have been engaged. If possible the person in charge of well-related activity on the facility should lead the sessions.

## Management of change

- ☐ Formal responsibilities and an interface mechanism between respective organisation management of change (MoC) processes has been detailed and distributed. The impact of the change has been detailed and each party signs off as having agreed to the change and understanding the impact.
- ☐ Visibility and sign-off requirements of representatives in the MoC process have been documented and distributed.
- ☐ A formal control mechanism and documentation process for MoC exists. For example material changes to the drilling program require sign-off to the same level as the original program.

## Exchange of information related to scope

- ☐ Information has been exchanged on activity scope, including contingencies and optional scope
- ☐ Communication on design basis, maximum anticipated temperatures and pressures has occurred.
- ☐ Communication of geological scenarios and impact on the facility, including any 'stop or hold points' has occurred. Stop or hold points may include achieving a specific leak off test (LOT) or formation integrity test (FIT) value or a valid verification of a barrier.
- ☐ Mutual events such as pre-spud meeting and inductions have been conducted that share information related to the activity.
- ☐ Design and suitability of well-control equipment has been agreed and signed off.
- ☐ Where applicable, inclusion of third parties has occurred in consultation with the title holder and facility operator (e.g. with regards to the description of safety critical barriers).

## Risk management processes

- ☐ The derivation and management of risk throughout the scope has been described and mutually understood.
- ☐ Mutual participation in relevant Hazard Identification and Operations (HAZIDs/HAZOPs) sessions to evaluate the effective identification of mitigations and controls associated with key risk events has occurred.
- ☐ A scope-specific risk register is in place and actively used during the activity.
- ☐ A plan to monitor effectiveness of risk management during execution of scope exists.
- ☐ Assurance activities associated with risk management have been agreed. These should focus on leading indicator rather than lagging indicators, i.e. monitoring the effectiveness of risk controls and recovery routines.

## Competency and training requirements

- ☐ Each organisation has described its competence validation process.
- ☐ Identify and list all personnel/positions that should hold valid well control certificate for the duration of the activity scope. Recognised certificates are either International Well Control Forum (IWCF) or WellCap.
- ☐ Emergency response training and regularly participated in emergency response training events are verified as having been completed.
- ☐ A deviation process is in place to manage any positions without agreed competencies.
- ☐ Audit, review and compliance checks are in place.



# Self Audit Tool Components Cont.

## Barrier definition and integrity

- ☐ A barrier philosophy is in place, agreed and tested.
- ☐ At least two qualified, tested barriers are in place for each phase of the activity.
- ☐ The activities that can be conducted with reduced barrier status have been agreed. Generally the only activity that can be conducted with just one barrier is to re-instate a second barrier.
- ☐ Relevant barrier diagrams/representations are in place for each phase of the activity including contingency suspension barriers. These representations should include barrier verification confirmation and acceptance criteria.
- ☐ The definition of accepted and tested barrier is in place and agreed. This includes pressure test criteria.
- ☐ The deviation process and validation of barrier risk assessment has been agreed before an activity begins. Any deviations against either party's standards should be reviewed and signed off and the agreed mitigation steps put in place and communicated to site representatives.

## Emergency response

- ☐ Description of emergency response plans, and bridging documents is in place.
- ☐ A formal duty process to assure 24/7 coverage of both license holder and facility operator exists. Handovers are included in the duty process and documented.
- ☐ Personnel from license holder and facility operator have confirmed training requirements for emergency response training and regularly participate in emergency response training events.
- ☐ Consideration has been given to drills and exercise schedules, including representatives from each organisation.

## Process for well control contingency planning requirements

- ☐ A well control plan has been prepared for the specific scope. This should contain information on prognosed pore pressure and fracture strength gradients, locations of possible over pressures and weak zones.
- ☐ Shut in methodology and well control flow charts are in place and agreed by both organisations.
- ☐ An agreed audit/drill schedule is in place to test the effectiveness of well control plans, including but not limited to choke, shut in and weight up drills. The crew training/ drills records and participation records should be recorded in daily reports and in competency records on location. The drill frequency is such that the crews are adequately trained and responsive in line with risk profile of the activity.
- ☐ Any differences in the approach/protocols between the title holder and facility operator have been included in a bridging document that has been mutually prepared and signed off.
- ☐ An audit/verification plan has been agreed to monitor mitigation measures and how these have been implemented and communicated to the site personnel.

## Mutual aid — relief well capability

- ☐ Agreements or other arrangements are in place internally to license holder with other operators in the area for emergency provision of a rig and if applicable stimulation vessels, supply vessels, etc. in case these are not available on short notice from within their own operations.
- ☐ It is known what critical equipment is needed in case of a blowout and whether and how it can be made available on short notice. Contractual arrangements are in place (e.g. blowout preventers (BOPs), wellhead, pumps, tanks, remotely operated vehicles (ROVs), pump/frac boats, fire hydrants, capping equipment etc).

## Well design requirements

- ☐ For every section with BOP protection, kick-tolerances have been calculated. Kick tolerance thresholds and limitations should be agreed between license holder and facility operator. This should include practical limitations of facility equipment (detection thresholds), and risk profile of the activity.
- ☐ A method of communicating well control risk is in place for each shift. Consideration has been given to the risk of casing wear, drill pipe hard-banding, planned and actual overbalance with margins for swab, riser margin, the maximum allowable annulus pressure.
- ☐ Survey procedures and frequency and anti-collision risks have been described.
- ☐ Particular attention has been given to cementing. The integrity of cement barriers can be affected by many factors. Actions that should be taken include:
  - isolating hydrocarbon-bearing zones in order to prevent gas flow after cementing and sustained annulus pressures
  - checking casing/liner cement programs on hydrostatic static/dynamic overbalance throughout the cement job with special attention to (unweighted) spacers in the open hole
  - selecting the cement setting times for the entire cement column
  - testing secondary pressure test if the float equipment fails
  - assessing the integrity of the casing(s) in case of a sidetrack well
  - evaluating annulus pressures as well as cement sheath integrity.

# Self Audit Tool Components Cont.

## Simultaneous operations (SIMOPS)

- ☐ In the case of simultaneous or concurrent operations a site-specific SIMOPS plan has been prepared and signed off.
- ☐ The complexity and uniqueness of SIMOPS activities involving multiple facility safety cases (e.g. Jack Up drilling installation in the vicinity of production jacket) has been specifically considered with detailed assessments, SIMOPS matrices and a manual of permitted operations.
- ☐ Dedicated HAZID/HAZOP events have taken place.
- ☐ A single focal point for SIMOPS activities has been identified on a chain of command, coordinating all SIMOPS-related activities and interfaces.
- ☐ Exercises and drills with field personnel have been conducted to evaluate the effectiveness of risk mitigations and control mechanisms.

## BOP & diverter system, choke manifold, LP & HP mud system

- ☐ License holder and facility operator have a written and agreed status on well control equipment that should comply at a minimum with industry codes (i.e. API RP 53). The organisations should have in place an agreement on the systems' configuration, redundancy levels and operability.
- ☐ Consideration has been given to the rated hang-off weights for fixed pipe rams (PR) and variable bore rams (VBR) (for relevant pipe sizes), pipe-shearing procedure, and shearing force sufficient to cut the pipe in use.
- ☐ Capacity and certification of all pipe work, including temporary pipe work is available; for facility operator, title holder, and third-party supplied equipment.

## MoU for Mutual Assistance

- ⇒ Sets up a framework for 'best endeavours' mutual assistance arrangements in drilling relief wells.
- ⇒ The Parties acknowledge that emergency conditions may arise that require drilling relief wells.
- ⇒ This would necessitate an urgent response and assistance by industry to minimise adverse impacts.
- ⇒ For timely response, the general principles of the MoU will form the basis for arrangements with the Drilling Operator, drilling unit(s) and contractor personnel, equipment, materials, consumables and other well-site services .



# **Memorandum of Understanding: Mutual Assistance**

**To Facilitate the Transfer of Drilling Units and  
Well-Site Services between Operators in  
Australian and Timor Leste-administered Waters  
to Overcome Emergency Conditions**

# An Australian Well Capping Solution

- ≡ The Australian and international industry has been working on the development of a capping strategy that will incorporate a regional and local capability.
- ≡ Australia has been leveraging this work to identify the optimum option for Australia.
- ≡ The Australian industry has commenced scoping and designing a local well capping solution suited for Australian conditions.
- ≡ This technology will form part of an integrated global, regional, and local approach.



# Industry Capacity to Respond - AMOSC



Industry has improved response by:

1. reviewing spill response equipment requirements and pre-positioned equipment to sensitive locations;
2. doubling the core group of spill responders available to work in an offshore incident;
3. developing new spill management response training;
4. investigating benefits & limitations of dispersants;
5. investing in a major program of trajectory monitoring; and
6. facilitating better access to international expertise.



# Montara Commission Report: Offshore Petroleum Regulation

- Identified serious concerns with the regulatory disconnects between safety critical functions, including environmental management, well design and operation, and integrity of facilities.
- As a result, the Commonwealth will seek to establish two new regulatory bodies:
  - ❑ NOPSEMA (a single integrated independent authority, responsible for safety, well integrity and environmental plans); and
  - ❑ NOPTA - responsible for the administration and regulation of petroleum titles in Commonwealth and State waters if State Governments chose to delegate this role to the Administrator.

# Industry's growth affected by our capacity to meet community expectations

- ≈ An increased industry led focus on environmental and safety management.
- ≈ Essential for maintaining community support and access to existing and new areas.
- ≈ Need to improve the performance of the industry, particularly around:
  - ≈ process safety;
  - ≈ drilling operations; and
  - ≈ integrity of ageing facilities.

# Conclusions

- ≡ We must always be prepared to challenge our performance and learn any lessons.
- ≡ We can - and will - deliver the safe and sustainable industry the Australian community demands.
- ≡ We must also acknowledge the total dedication and skills of so many in our industry, including you here today.
- ≡ For more than a decade, we have had a better safety performance than the retail, teaching, tourism, manufacturing and mining industries.



We have much to celebrate in an exciting industry with so much to offer the Australian community.

Australian Petroleum Production & Exploration Association (APPEA)