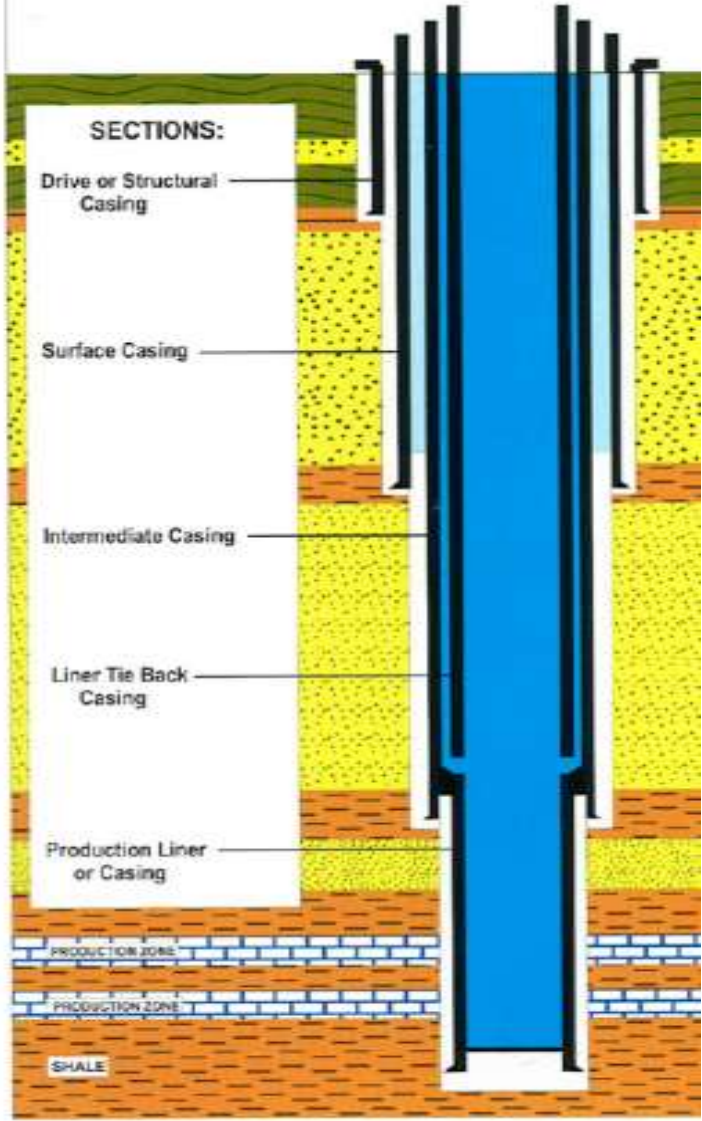




# Oil and Gas UK Well Integrity Guidelines



- The Well, the Completion and the Xmas Tree
- The Equipment and the People
- A Definition of Well Integrity
- Key UK Legislative Requirement for Well Integrity
- Oil and Gas UK Well Integrity Workgroup and Interfaces
- Evolution of the UK Well Integrity Guidelines
- Scope, Style and Content of the Guidelines
- Key Requirements in the Guidelines
- Updates in Issue 2 of the Well Integrity Guidelines
- Next Steps
- Summary



**Wellhead:** installed on top of the surface casing to cap the well and hold the casing strings and completion.

**Conductor:** isolates unconsolidated surface formation and may take structural loads. Typically 36" hole to contain 30" conductor.

**Surface Casing:** isolates surface formations, typically 24" hole for 18.5/8" diameter casing.

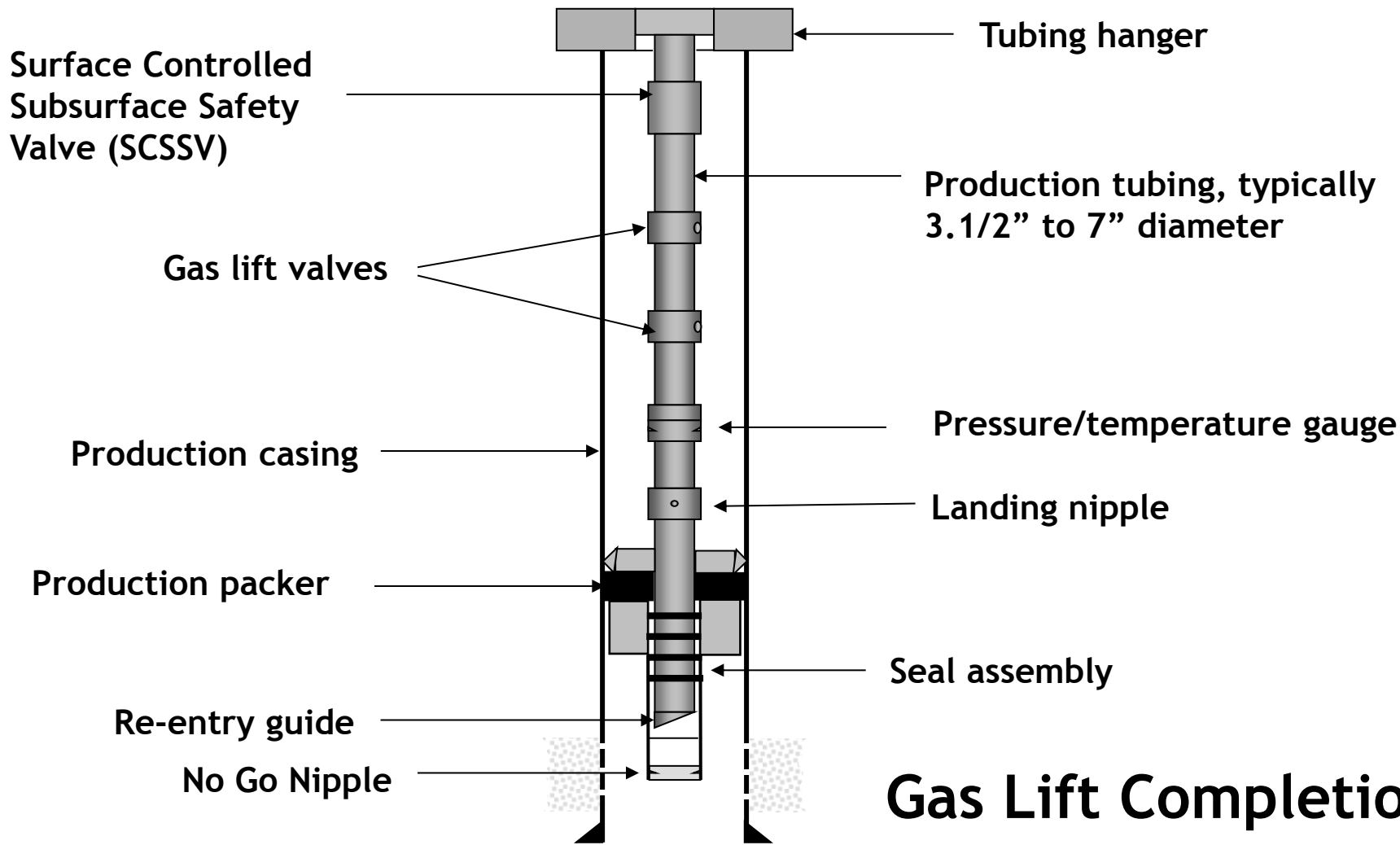
**Intermediate Casing:** isolates pressure/problem zones above the reservoir. Typically 17.1/2" hole for 13.5/8" diameter casing.

**Production Casing:** Typically set above the Reservoir, typically 12.1/4" hole for 9.5/.8" casing.

**Production Liner:** Set across the Reservoir into the production casing, typically 8.1/2" hole for 7" liner.

# The Well





## Gas Lift Completion

The Completion



# The Xmas Tree





# Equipment and People



“The application of technical, operational and organisational solutions to reduce the risk of an uncontrolled release of formation fluid throughout the well life cycle.”



## **Statutory Instrument 913: The Offshore Installations and Wells (Design and Construction, etc.) Regulations 1996, Part IV, Wells, General Duty:-**

The well-operator, shall ensure that a well is so designed, modified, commissioned, constructed, equipped, operated, maintained, suspended and abandoned that –

- (a) so far as is reasonably practicable, there can be no unplanned escape of fluids from the well; and
- (b) risks to the health and safety of persons from it or anything in it, or in the strata to which it is connected, are as low as is reasonably practicable.

**Key UK Legislative Requirement for Well Integrity**





**Well Operators:**

- BP, Senergy,
- CNOOC Nexen,
- Shell, Centrica,
- Canadian Overseas Petroleum,
- Talisman Sinopec,
- Total, Chevron,
- Perenco, Tullow,
- Taqa, Hurricane,
- Conoco Phillips,
- Wintershall



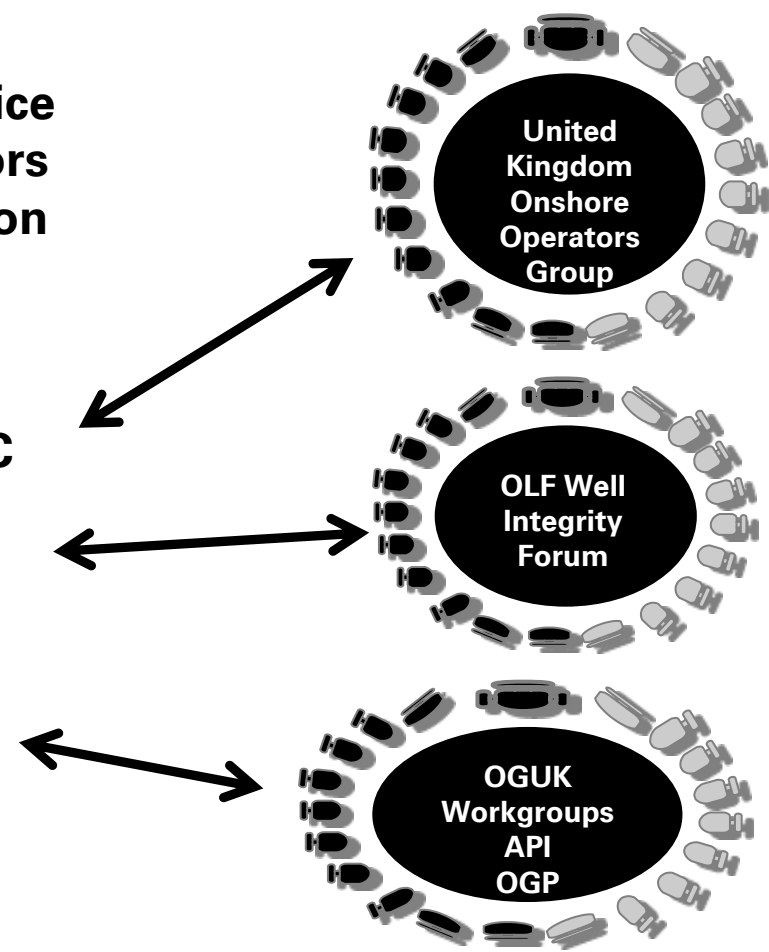
**OGUK**

**Well Service Contractors Association**

**IADC**

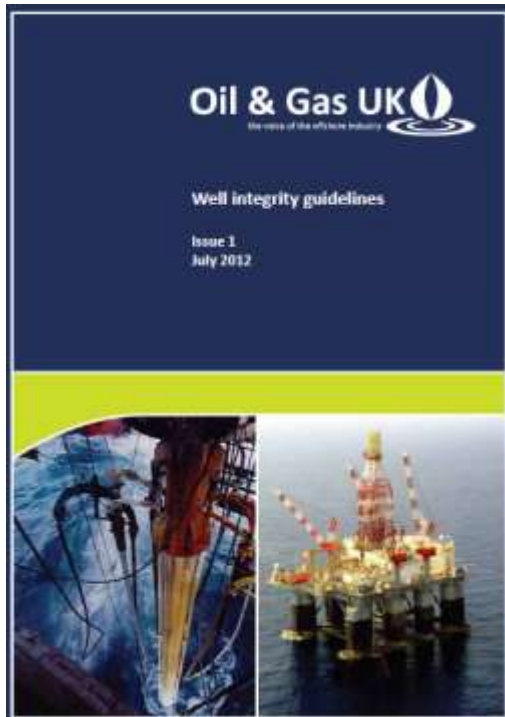
**HSE**

**DECC**

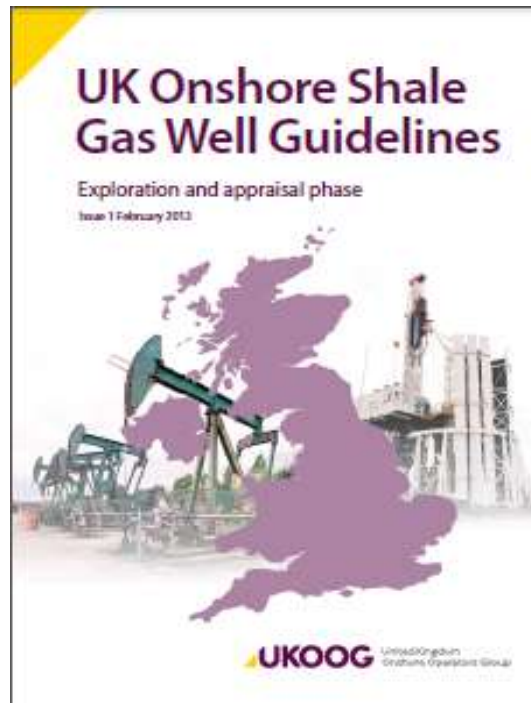


# Oil and Gas UK Well Integrity Workgroup and Interfaces

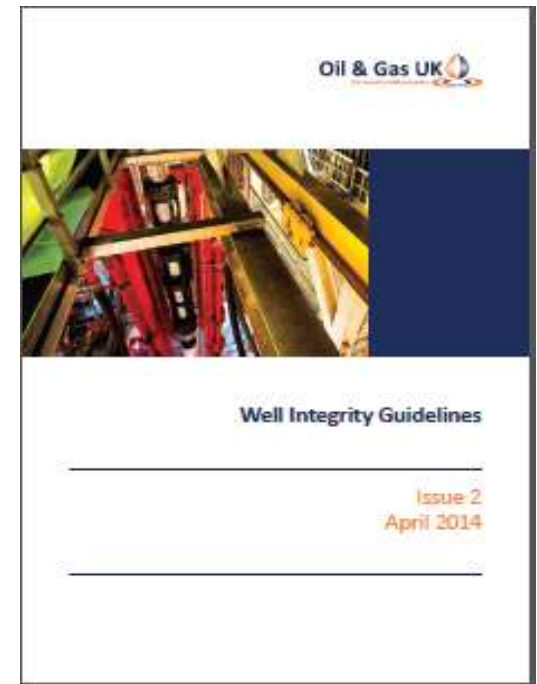




First issue written and published in July 2012, 18 months after the workgroup was formed.



Onshore shale gas guidelines cross reference the Well Integrity Guidelines and address additional shale gas specific issues.



Issue 2 published in April 2014, Issue 3 of the UK Onshore Shale Gas Guidelines published in April 2015

# Evolution of UK Well Integrity Guidelines



- Document Good Industry Practice to help Industry meet the requirements of UK legislation and avoid a loss of well integrity.
- 147 pages written for “the man on the rig” in a style designed to encourage discussion.
- Operators do not have to follow the Guidelines but should be prepared to justify how their approach reduces risk to “as low as reasonably practicable”.
- Relevant to all wells, and well operations, for the purpose of exploiting naturally occurring hydrocarbons – onshore and offshore.
- Focus on typical wells & standard operations. **Reference** existing standards and guidelines, rather than creating new.
- Address HSE guidance relating to well integrity, including the Well Construction Standards. Include guidance on roles and responsibilities.



# Scope and Style of the Well Integrity Guidelines

## GENERAL

- Summary
- Key legislation
- Well Integrity Management System
- Well barriers
- Pressure testing
- Management of change
- Risk assessment
- Reference documents

WELL

LIFE

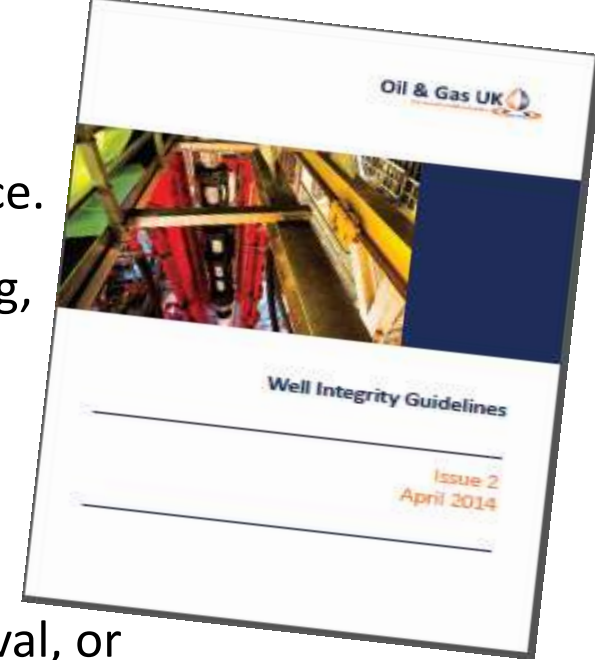
CYCLE

- Well design & operations planning
- Drilling
- Well testing
- Completion
- Commissioning
- Operate & maintain
- Intervention & workover
- Suspension & abandonment

Content

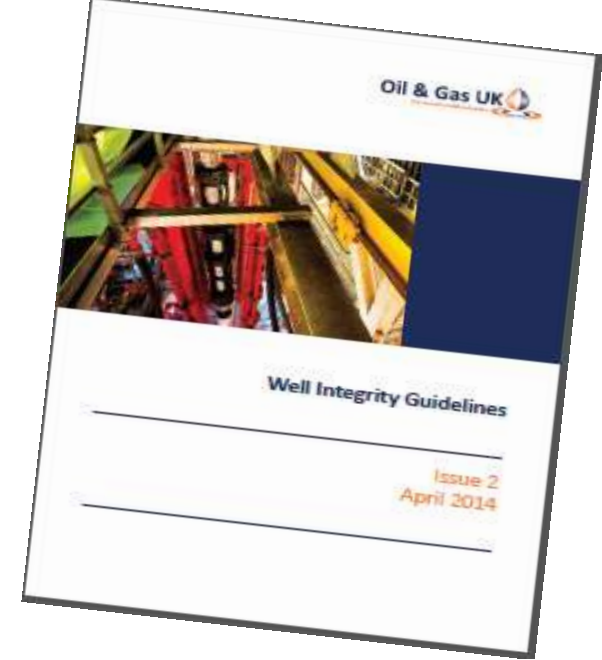


- Well integrity can be assured by keeping adequate barriers between the hazards in the well and the surface.
- The selection, installation, monitoring, checking, testing, maintenance and repair of barriers are the most important aspects of well planning and operations.
- There should be at least two barriers available throughout the well life cycle. Barriers should be explicitly described in procedures and plans. The removal, or degradation, of a well barrier should be carefully considered.
- A cemented shoe track is not a barrier unless specifically designed to be so.
- All well designs should start with an assessment of the hazards from the well. The design should ensure that the risks are ALARP and the well should be designed for all anticipated uses. Hazards should be reviewed throughout the life of the well and any significant changes assessed.



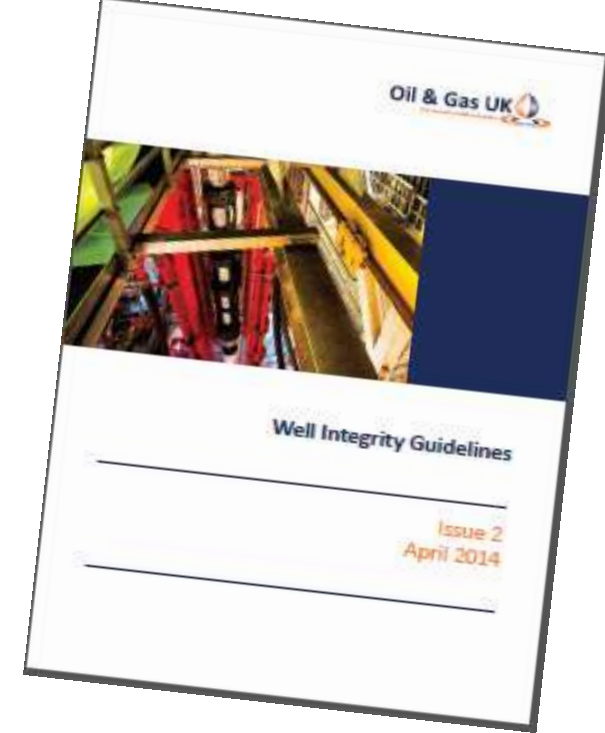
## Key Requirements to Maintain Well Integrity

- The well operator is responsible for assessing the well risks and reducing them to ALARP. This should be demonstrated to the offshore installation duty holder.
- All wells should be designed with suspension and final abandonment in mind.
- Well operator's should have a policy for well integrity and a well integrity management system to interpret and apply the Policy. This should include a management of change procedure.
- The "human element" is very important in all aspects of well integrity. Duty holders should provide an effective management system and ensure that personnel are competent in the tasks that they are required to perform.



## Key Requirements to Maintain Well Integrity

- Well Integrity Management System section added.
- “Educational” content removed.
- Greater emphasis on the effects of degradation.
- Updated pressure testing, kick tolerance and deciding acceptance criteria, available documents cited.
- Use of “step-down” charts emphasised for inflow testing.
- Example design factors and wellhead seal testing updated.
- New section “Setting Operating Limits based on MAASP”.
- Fully revised Annulus Management guidance.
- Added guidance on well integrity Regulatory reporting.
- New section on coiled tubing pressure control equipment.
- New section on considerations for cuttings re-injection wells.
- Collision avoidance and pumping (stimulation) guidance updated.



*Issue 2 addressed Issue 1 feedback, additional material requested by Industry, alignment with Norsok D-010 Rev4 and draft OGP well integrity technical documents*

# Updates in Issue 2 of the Guidelines



- Working on Issue 3 to address the following:-
  - Feedback on Issue 2.
  - Update and expand on well life extension.
  - Update Regulatory Requirements to align with Safety Case 2015 Regulations.
  - Align with ISO 16530 Life Cycle Well Integrity Governance.



- Will update and re-issue the Shale Gas Guidelines to align with Issue 3.
- Guidelines have been integrated into the Robert Gordon University syllabi, intent to work with other academic institutions to do the same.
- Guidelines have been incorporated into well control training (IWCF) and questions are being added to the well control examinations.

## Next Steps





- Developed through a collaborative approach to provide Guidance on Good Industry Practices to maintain well integrity and meet UK Regulatory Requirements.
- Applicable to all wells in the UK, onshore and offshore, for the purpose of exploiting naturally occurring hydrocarbons.
- Wherever possible align with ISO, API and Norsok documents.
- Cover the full well life cycle and include: references, key UK legislation, HSE wells guidance, management system considerations, roles and responsibilities, principles and practices to be applied throughout the life cycle.
- Continually evolving, Issue 3 due in 2016.
- Guideline content being integrated into academic syllabi and well control training and examination.

## Summary: UK Well Integrity Guidelines





“Acquire a copy of the Well Integrity Guidelines (available from [www.oilandgasuk.co.uk](http://www.oilandgasuk.co.uk)) and use them to help you fulfil your duties. Feedback to [wlcpf@oilandgasuk.co.uk](mailto:wlcpf@oilandgasuk.co.uk)”

Close

