



Commission for Energy Regulation

An Coimisiún um Rialáil Fuinnimh

Compliance Assurance System

Part of the Petroleum Safety Framework

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Glossary of Terms and Abbreviations

List of Abbreviations

Abbreviation	Meaning
ALARP	As Low As is Reasonably Practicable
BOP	Blow-out Preventer
CER	Commission for Energy Regulation
ESD	Emergency Shutdown
HAZOP	Hazard and Operability Study
ICB	Independent Competent Body
ID	Identifier
IMO	International Maritime Organisation
IRB	Independent Review Body
MAH	Major Accident Hazard
MODU	Mobile Offshore Drilling Unit
PED	Pressure Equipment Directive (97/23/EC)
PSO	Petroleum Safety Officer
PSV	Pressure Safety Valve
QRA	Quantified Risk Assessment
SCE	Safety Critical Element
SMS	Safety Management System
SSIV	Subsea Isolation Valve

List of Defined Terms

Words and phrases defined in Section 13A of the Act shall, unless the context otherwise requires, have the same meanings when used in this document.

Term	Definition or Meaning
(the) Act	The <i>Electricity Regulation Act 1999</i> as amended, <i>inter alia</i> , by the <i>Petroleum (Exploration and Extraction) Safety Act 2010</i> .
ALARP Guidance	The <i>ALARP Guidance</i> document describes processes that must be used to determine whether a risk is ALARP. The <i>ALARP Guidance</i> document, as amended from time to time, forms part of the Framework.
Compliance Assurance System	The <i>Compliance Assurance System</i> document describes processes used by the CER and petroleum undertakings to assure compliance with the Act and the Framework. The <i>Compliance Assurance System</i> document, as amended from time to time, forms part of the Framework.
Facilities Verification Scheme	A Facilities Verification Scheme is a description of the work carried out by Independent Competent Body(s) to verify whether a petroleum undertaking has identified and continues to meet suitable performance standards for SCEs for pipelines and Facilities (except wells).
Facility	A piece of petroleum infrastructure other than a pipeline.
Framework	The Petroleum Safety Framework established under section 13I of the Act that comprises a collection of regulations, written regulatory documents and procedures which, taken together, describe the system the CER uses to regulate the activities of petroleum undertakings with respect to safety.
(the) General Duty	The duty placed on petroleum undertakings by section 13K of the Act to ensure that: <ol style="list-style-type: none"> a) Any petroleum activity is carried on in such a manner as to reduce any risk to safety to a level that is As Low As is Reasonably Practicable (ALARP); and b) Any petroleum infrastructure is designed, constructed, installed, maintained, modified, operated and decommissioned in such a manner as to reduce any risk to safety to a level that is ALARP.
Good Practice	The recognised risk management practices and measures that are used by competent organisations to manage well-understood hazards arising from their activities.
Independent Competent Body	An independent and competent organisation engaged by the petroleum undertaking, under the <i>Compliance Assurance System</i> , to execute a Verification Scheme.

Term	Definition or Meaning
Independent Review Body	An independent and competent organisation engaged by the petroleum undertaking, under the <i>Compliance Assurance System</i> , to carry out an Independent Safety Case Review.
Independent Safety Case Review	A review carried out in accordance with section 4 of the <i>Compliance Assurance System</i> document either as a condition of a safety permit or as a result of a direction by the CER.
Major Accident	An event, such as a major emission, fire, explosion, impact or structural failure of petroleum infrastructure, resulting from uncontrolled developments in the course of petroleum activities that could lead to a serious danger to human health whether immediate or delayed. Serious danger implies events which could impact multiple persons, including members of the public and/or workforce.
Major Accident Hazard	A hazard that if realised could result in a Major Accident.
Non-production Installation	Offshore or onshore equipment involved in Well Work Activities such as drilling, interventions, workovers and well testing. Such installations do not normally carry out processing or export of well fluids although some process equipment may be involved in well testing.
Notified Body	The definition of a Notified Body is as per the Pressure Equipment Directive (97/23/EC) or the ATEX Workplace Directive (99/92/EC) as appropriate.
Petroleum Incident Regulations	The <i>Petroleum Safety (Petroleum Incident) Regulations 2013</i> .
Production Installation	A Production Installation is equipment used in the extraction and/or processing of reservoir fluids and includes fixed and floating offshore installations, onshore installations and associated pipelines. A floating production storage and offloading vessel is a Production Installation due to its connection to the reservoir whereas a shuttle tanker is not.
Reportable Petroleum Incident	A Reportable Petroleum Incident is an event or occurrence that must be reported to the CER as set out in the Act, <i>Petroleum Incident Regulations</i> and associated guidance.
Safety Critical Element	Safety Critical Elements are parts of a Facility and its plant, including computer programs, a purpose of which is to prevent or limit the effect of a Major Accident, or the failure of which could cause or contribute substantially to a Major Accident.
Safety Management System	The framework of policies, processes and procedures that enable the petroleum undertaking to manage its safety risks and continually improve its safety performance.
Verification Scheme	Denotes the Facilities Verification Scheme and/or the Well Verification Scheme.

Term	Definition or Meaning
Well Verification Scheme	A Well Verification Scheme is a description of the work carried out by an Independent Competent Body(s) to verify whether a petroleum undertaking has identified and continues to meet suitable performance standards for well-related SCEs and that well integrity is maintained.
Well Work Activity	An activity that alters the pressure containment boundary of a well; or introduces wire, cable or hollow pipe into a well. Such an activity is designated and requires a well work safety permit.

1 Introduction

1.1 The Petroleum Safety Framework

The *Electricity Regulation Act 1999*, as amended *inter alia* by the *Petroleum (Exploration and Extraction) Safety Act 2010* (the Act) gives the Commission for Energy Regulation (CER) responsibility for the safety regulation of petroleum exploration and extraction activities in Ireland. The Act requires the CER to “establish and implement a risk-based Petroleum Safety Framework” (referred to in this document as the Framework). The Framework is the overall system established by the CER to regulate the safety of petroleum activities¹, in particular designated petroleum activities,² carried out by petroleum undertakings.³ The Framework established under the Act is a permitting regime, is goal-setting and risk-based, whereby petroleum undertakings are required to reduce risks to a level that is as low as is reasonably practicable (ALARP).

1.2 Compliance Assurance System

1.2.1 Legal Context

The Act confers upon the CER the *principal objective* in carrying out its functions to *protect the public by fostering and encouraging safety as respects the carrying on of designated petroleum activities*.⁴ The CER has a general function to *do all things necessary and reasonable to further its objectives and...exercise its powers and perform its functions in the public interest*.⁵

The CER has a number of specific functions, including in this context to:

- Incorporate in the Framework a system for the on-going audit and inspection of designated petroleum activities, the standards and systems for assessing safety performance; and
- Monitor and enforce compliance of petroleum undertakings with their obligations under Part IIA of the Act.⁶

Petroleum undertakings also have a range of duties under the Act.

Petroleum undertakings are obliged to comply with a General Duty⁷ to ensure that:

- a) Any petroleum activity is carried on in such a manner as to reduce any safety risk to a level that is ALARP; and
- b) Any petroleum infrastructure is designed, constructed, installed, maintained, modified, operated and decommissioned in such a manner as to reduce any safety risk to persons to a level that is ALARP.

¹ As defined in section 13A(2) of the Act.

² As defined in the *Petroleum Safety (Designation of Certain Classes of Petroleum Activity) Regulations 2013*.

³ As defined in section 13A(1) of the Act.

⁴ Section 13G of the Act.

⁵ Section 13H(1) of the Act.

⁶ Section 13H(2)(c) of the Act.

⁷ Section 13K of the Act.

The Act also provides for a range of specific duties for petroleum undertakings including:

- To refrain from carrying on designated petroleum activities or an established petroleum activity unless a safety permit is in force in respect of the petroleum activity concerned;⁸
- To prepare and submit a safety case with respect to designated petroleum activities for the approval of the CER in accordance with *Safety Case Guidelines*,⁹ and to conform with the approved safety case;¹⁰
- To notify the CER of Reportable Petroleum Incidents;¹¹ and
- To comply with Improvement Notices,¹² Prohibition Notices¹³ and other notices and directions issued by the CER.

A safety case submitted by a petroleum undertaking must include, amongst other things, particulars to demonstrate to the CER that adequate arrangements for monitoring, audit and for the making of reports on safety performance and compliance have been established.¹⁴ In addition, the petroleum undertaking must demonstrate in the safety case that it has met the requirements for independent verification by an Independent Competent Body (ICB) as set out in section 2.3.1 of this *Compliance Assurance System* document.

Non-compliance by a petroleum undertaking with its duties under the Act including non-compliance with its safety case or safety permit may result in enforcement action by the CER, including issuance of an improvement or enforcement notice, the revocation of the safety permit, and/or criminal prosecution.

1.2.2 Purpose of the Compliance Assurance System

Responsibility for safety rests with each petroleum undertaking. Each petroleum undertaking must satisfy itself as to the adequacy of, and ensure implementation of, measures to reduce risks to safety to a level that is ALARP. The adequacy of measures must be demonstrated within the petroleum undertaking's safety case. Where the CER approves a safety case, it will issue a safety permit to the petroleum undertaking. A petroleum undertaking must comply with its approved safety case and the conditions contained in the associated safety permit, as well as their obligations under the Act.

The *Compliance Assurance System* document forms part of the Framework, and must be complied with by petroleum undertakings. The overall purpose of the *Compliance Assurance System* in the Framework is to measure and ensure compliance by petroleum undertakings with their duties under the Act, their safety case and safety permit and the General Duty (as outlined above) to design, construct, operate and maintain their activities in such a manner as to reduce any safety risk to persons to a level that is ALARP. More specifically, the

⁸ Section 13E of the Act.

⁹ Section 13M of the Act.

¹⁰ Section 13O and 13P of the Act.

¹¹ Section 13S of the Act.

¹² Section 13Z(10) of the Act

¹³ Section 13AA(9) of the Act.

¹⁴ Section 13M(4)(e) of the Act.

Compliance Assurance System is the system that defines how:

- a) Petroleum undertakings must carry out verification, report on safety performance and carry out Independent Safety Case Reviews; and
- b) The CER audits and inspects petroleum undertakings for compliance and, as necessary and appropriate, may enforce and/or prosecute accordingly.

The *Compliance Assurance System* is framed in two parts. The first part sets out the requirements on petroleum undertakings to:

- Implement a Verification Scheme(s) using ICBs;
- Report on safety performance indicators to the CER on a quarterly basis; and
- Conduct Independent Safety Case Reviews.

The second part sets out the system the CER uses to audit and inspect petroleum undertakings to determine compliance with the safety case, safety permit and the requirements upon petroleum undertakings under the first part of the *Compliance Assurance System* bulleted above.

The outcomes of the CER's audits and inspections may form the basis of further engagement by the CER with the petroleum undertaking, enforcement action and/or prosecution under the Act. The CER's enforcement powers are progressive in nature and designed to facilitate interaction and cooperation with the petroleum undertaking in the first instance and to encourage compliance.

The *Compliance Assurance System* as part of the Framework is illustrated in Figure 1 on the following page.

1.3 Structure and Interpretation

1.3.1 Structure of the Document

Part 1 is comprised of three sections detailing the following requirements upon petroleum undertakings:

- Verification (section 2);
- Safety Performance Reporting (section 3);
- Independent Safety Case Review (section 4);

Part 2, Audit and Inspection by the CER of Petroleum Undertaking Compliance (section 5) outlines how the CER monitors compliance of petroleum undertakings with their obligations under the Act.

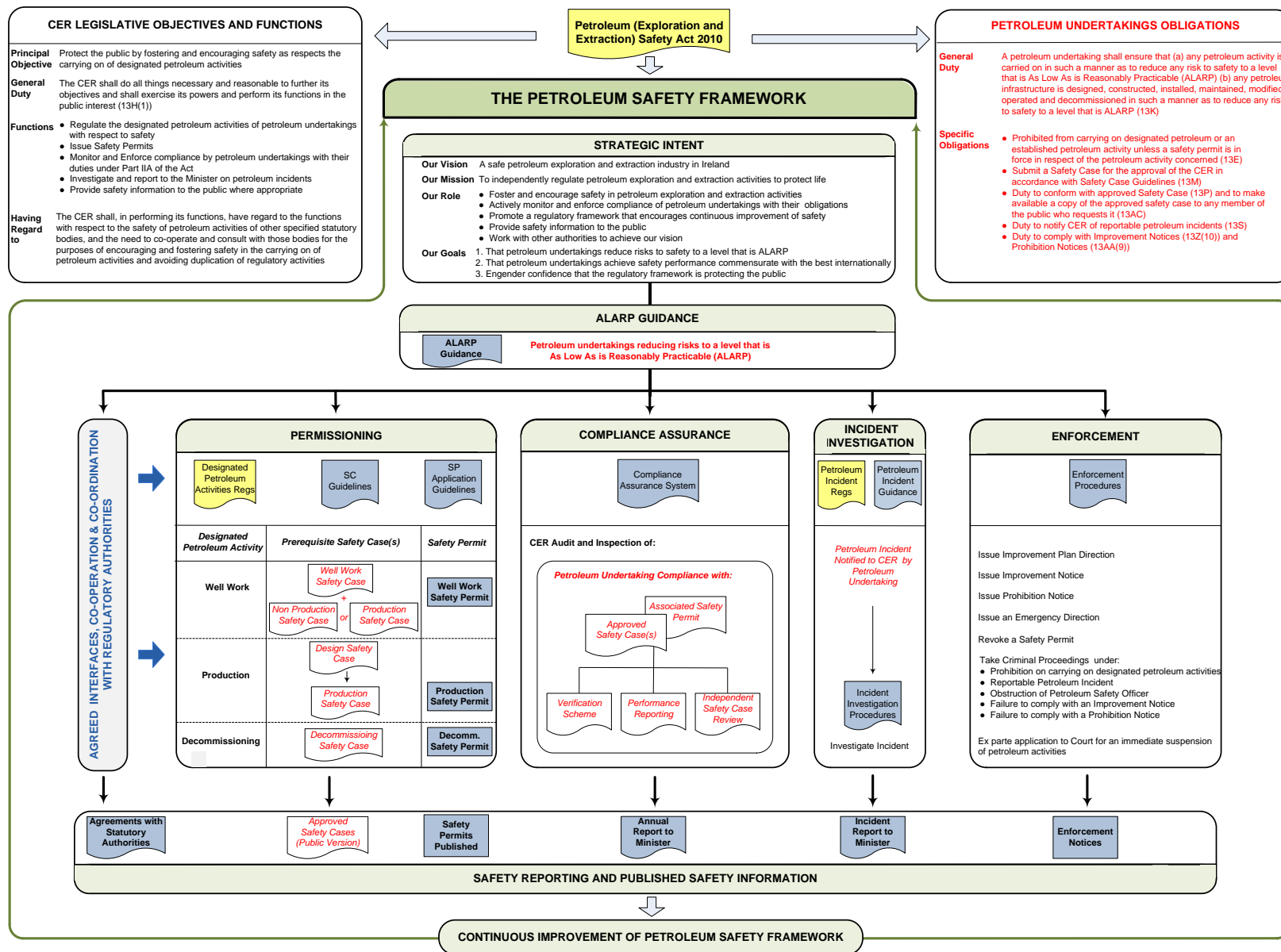


Figure 1: Overview diagram of Petroleum Safety Framework

1.3.2 Interpretation

For ease of reference, the CER has summarised certain provisions of the Act in this document. Such summaries are provided for convenience only and are not intended as a substitute for or legal interpretation of the Act and shall not relieve any petroleum undertaking from any obligation under the Act or operate as a defence to any failure to comply with its obligations under the Act.

In accordance with section 13B of the Act, nothing in the Act or within this document shall be read as to be restrictive of any other duty, requirement or obligation imposed by law in respect of safety which would otherwise apply to a petroleum undertaking.

Examples of the application of this *Compliance Assurance System* are provided in example boxes, which are illustrative only and are included to aid understanding and are not prescriptive or exhaustive. They do however represent the CER's understanding in relation to the subject matter of the example.

PART 1

COMPLIANCE ASSURANCE SYSTEM REQUIREMENTS TO BE IMPLEMENTED BY PETROLEUM UNDERTAKINGS

2 Verification

Petroleum undertakings must have in place Verification Schemes for verifying the suitability and performance of Safety Critical Elements (SCEs) and the maintenance of well integrity, by one or more organisations, termed Independent Competent Body(s) (ICBs). Verification is required for all petroleum infrastructure related to the carrying on of a designated petroleum activity, including offshore and onshore Facilities, pipelines, wells and for all phases of the petroleum infrastructure's lifecycle.

The petroleum undertaking is required to appoint one or more ICBs, in accordance with the procedure set out in section 2.1 below, to verify the initial (design) and continuing (operations) performance of the SCEs and well integrity. In this regard a:

- Well Verification Scheme must be in place for all wells and all well work; and
- Facilities Verification Scheme must be in place for all petroleum infrastructure that relates to each safety permit and is outside the scope of a Well Verification Scheme.

Verification is carried out by assessing and reviewing a cross-section of the petroleum undertaking's processes used to define and maintain SCEs and well integrity such that risks are verified to be ALARP. The verification must be such that the ICB is carrying out sufficient verification to be able to judge whether the SCEs are initially and will continue to meet their performance standards, or well integrity will and is being maintained.

A Verification Scheme must give a description of the work to be carried out by an ICB to verify whether the petroleum undertaking meets suitable performance standards for SCEs and maintains well integrity. It is the responsibility of the petroleum undertaking to establish and ensure implementation of the Verification Scheme. The Verification Scheme must, however, be reviewed by the ICB.

The responsibility for ensuring that the ICB carries out verification under the Verification Scheme rests with the petroleum undertaking.

The verification requirements are in addition to the requirement that the safety case must include, *inter alia*, sufficient information to demonstrate that adequate arrangements have been established for monitoring, audit and for the making of reports on safety performance and compliance.¹⁵

This section of the *Compliance Assurance System* document sets out the specific requirements for:

- Appointment of an ICB by a Petroleum Undertaking (section 2.1);
- Verification Scheme Processes (section 2.2);
- Safety Case Content and Linkage with Safety Permits (section 2.3);
- Facilities Verification Scheme Requirements (section 2.4); and
- Well Verification Scheme Requirements (section 2.5).

¹⁵ Section 13M(4)(e) of the Act.

2.1 Appointment of an ICB by a Petroleum Undertaking

2.1.1 Competence and Independence

2.1.1.1 Submission to the CER

A petroleum undertaking must submit its choice of ICB(s) to the CER for approval. For the ICB(s) that cover the scope of a Well Verification Scheme, or a Facilities Verification Scheme, a single submission must be made in a format defined by the CER¹⁶ in which the petroleum undertaking must:

- Demonstrate how the entire Verification Scheme will be carried out by the ICB(s);
- Provide confirmation that the ICB is certified to ISO 9001, or provide a demonstration that the ICB operates a quality management system that meets the same goals (for all work under the Verification Scheme);
- Describe how the ICB meets the independence requirements in section 2.1.1.3; and
- Describe any previous and current associations between the petroleum undertaking and the ICB, any potential conflicts of interest and how such issues will be managed.

The CER will approve¹⁷ or reject the ICB on the basis of the evidence provided in the submission (see section 2.3.2 in regard to when this needs to be done in relation to submission of an application for a safety permit). The CER will inform the petroleum undertaking as to the outcome of their review of the ICB; this will be as soon as is practicable, but in any event no later than 4 weeks after receipt of the submission.

Re-approval of an ICB is not required in relation to the submission of a material change to a safety case, so long as the petroleum undertaking is satisfied that the material change is within the competency of the existing approved ICB.

Section 2.1.1.2 below gives additional competency guidance that must be met by the ICB. Whilst this information is not required in the submission to the CER for ICB approval, the petroleum undertaking must be able to demonstrate at any time that the ICB is continuing to meet these competency requirements.

A petroleum undertaking may appoint more than one ICB to implement a Verification Scheme provided it can demonstrate that the entire content of the Verification Scheme is covered. Further details regarding multiple ICBs are given in section 2.1.2.

A petroleum undertaking may change ICB, subject to the requirement that the proposed choice of ICBs must be submitted to the CER for its prior review and approval (see section 2.1.3).

¹⁶ The appropriate form is provided on the CER website.

¹⁷ The CER's approval in no way relieves the petroleum undertaking of any responsibility under the Act, or of its duty to ensure that verification is carried out by suitably independent and competent persons.

2.1.1.2 Competence Guidance

Guidance is provided in relation to three key components of ICB competency, namely:

- That the ICB has persons with the necessary competence, skill, experience, knowledge and training;
- The system the ICB has in place to manage competency; and
- The work allocation system that the ICB has for ensuring that suitable numbers of competent persons carry out the verification activities required by the Verification Scheme.

Individuals

The ICB must have individuals available to carry out verification with suitable knowledge, experience and training to carry out the tasks allocated to them for the type of petroleum infrastructure being verified. They must have the competence to critically assess the petroleum undertaking's system for ensuring SCE are suitably designed and operated to meet performance standards that make the risk ALARP. This means that the ICB will need individuals who are competent in design assessments, maintenance systems, or the actual carrying out of maintenance on the petroleum infrastructure such that over all the ICB's individuals all of the technical areas are covered.

Competency System

The ICB must ensure the competency of individuals through procedures to evaluate and manage competency. These procedures must include:

- Job descriptions that state minimum qualifications and minimum experience requirements;
- A definition of the required competence;
- Periodic assessments that evaluate continuing competence and identify on-going training requirements;
- Training records to be made and maintained; and
- A procedure for the selection of persons with competency appropriate to the task. This could take the form of a competency matrix showing the aspects of the Verification Scheme that specific persons are competent to undertake.

Work Allocation System

The range of competencies needed to cover the wells, well-related equipment and the SCEs is extensive. It is expected that multiple technical specialists will be required by the ICB for verification, and that this will take due cognisance of the number of technical specialists the petroleum undertaking requires for its operations.

The ICB(s) must have a work allocation system that ensures that suitable numbers of competent persons carry out work under the Verification Scheme.

2.1.1.3 Independence

The ICB's persons carrying out verification activities must:

- Be impartial and free from direct financial or operational pressures, which could affect their judgement;
- Not verify their own work;
- Not be employed directly by the petroleum undertaking, or any constituent member thereof, its parent company or a company in the same group; and
- Not, if a person is working for an organisation identified in section 4.2.5 of the *Safety Case Guidelines*, or any constituent member of such a company, its parent company or a company in the same group, verify the work of that organisation.

2.1.2 Multiple ICBs

Verification may be carried out by more than one ICB provided the petroleum undertaking ensures that the entire content of the Verification Scheme is completed.

Where more than one ICB is appointed, the petroleum undertaking's Safety Management System must document the interface and communications between all parties, together with clear roles and responsibilities.

2.1.3 Change of ICB

In order to change ICB, or add an additional ICB, a new ICB submission must be made to the CER in accordance with section 2.1.1.

The petroleum undertaking must ensure that the following are made available to the incoming ICB (as applicable to their scope of verification):

- The current status of all verification activities;
- The list of open anomalies with the actions and planned closure dates; and
- The list of current verification reservations.

The petroleum undertaking must ensure the accuracy of all records and that continuity of verification activities is maintained through a change of ICB.

2.2 Verification Scheme Processes

2.2.1 Overview of Schemes

2.2.1.1 Facilities Verification

A petroleum undertaking's Facilities Verification Scheme defines the work and process whereby the ICB verifies that the performance standards for the SCEs are suitably defined and that the SCEs operate to them throughout the lifecycle of the installation. For each performance criterion for each SCE, the Facilities Verification Scheme must define the verification activities that the ICB carries out.

The Facilities Verification Scheme is comprised of the activities carried out by the ICB:

- To verify:
 - The suitability and completeness of the chosen SCEs;
 - The suitability of the performance standards for the SCEs;
 - That the SCEs meet the performance standards from design through on-going operations to ensure risks to persons are ALARP;
- To raise and accept closure of anomalies; and
- To raise verification reservations.

As part of the above, the Facilities Verification Scheme must include review of procedures used to manage the performance of SCEs including, but not limited to, procedures used to:

- Assess the safeguards that may be needed should an SCE fail (often called operational risk assessment);
- Determine under what conditions maintenance can be deferred; and
- Determine maintenance intervals (e.g. risk-based inspection).

Detailed requirements for the Facilities Verification Scheme are given in section 2.4, and Appendix A gives an example list of verification activities, which are aligned to the SCE's performance standard.

2.2.1.2 Well Verification

A petroleum undertaking's Well Verification Scheme defines the work and process whereby the ICB verifies that well integrity is maintained, the performance standards for well-related SCEs are suitably defined and that the SCEs operate to them over the lifecycle of the well. For each performance criterion and for well integrity, the Well Verification Scheme must define the verification activities that the ICB carries out.

The Well Verification Scheme is comprised of the activities carried out by the ICB:

- To verify:
 - Well integrity from design through on-going operations;
 - The suitability and completeness of the chosen well-related SCEs;
 - The suitability of the performance standards for the well-related SCEs;
 - That the well-related SCEs meet the performance standards from design through on-going operations;
- To raise and accept closure of anomalies; and
- To raise verification reservations.

As part of the above, the Well Verification Scheme must include the review of the procedures that are used to manage the performance of well-related SCEs including, but not limited to, systems to:

- Assess the safeguards that may be needed should an SCE fail (often called operational risk assessment);
- Determine under what conditions maintenance can be deferred;
- Determine maintenance intervals (e.g. risk-based inspection); and
- Provide for dispensation to deviate from a defined well policy, or part of a performance standard (e.g. non operation of a downhole safety valve).

If Well Work Activity is being carried out with a Non-production Installation, the Well Verification Scheme must include verification of the suitability of the specific combination of the well and Non-production Installation that is being used for the well work.

Detailed requirements for the Well Verification Scheme are given in section 2.5.

2.2.1.3 Overlap of Verification Schemes

Where a well is connected to a Production Installation or Non-production Installation, there may be an overlap between the Facilities and Well Verification Schemes. To avoid duplication, where appropriate, verification carried out for a Well Verification Scheme may be cited by the petroleum undertaking as part of the Facilities Verification Scheme arrangements and vice versa, provided that there is no gap between them whereby, for example, a part of the well, or an SCE is not covered by any Verification Scheme.

2.2.2 Anomalies and Reservations

2.2.2.1 ICB and Petroleum Undertaking Process

If, in carrying out the Verification Scheme, the ICB determines that the petroleum undertaking is not in compliance with its performance standards, or associated procedures, or will or is not maintaining well integrity (the bulleted lists in the two sections above), the ICB must raise an anomaly,¹⁸ which is defined as follows:

An **anomaly** is a failure identified by the ICB of either the petroleum undertaking's system for maintaining well integrity, or the performance of a SCE, or the associated assurance processes, or the Verification Scheme itself, at any point of the lifecycle.

For any anomaly raised, the petroleum undertaking and the ICB must endeavour to agree the required action and the time within which this action must be completed such that the SCE achieves the performance standard, well integrity is maintained or the anomaly is otherwise satisfactorily closed-out. The petroleum undertaking must obtain the ICB's agreement that the planned closure date for rectification of the anomaly is as soon as is reasonably practicable and this may take into account other temporary risk reduction measures that have been put in place. The ICB must assess whether the action taken by the petroleum undertaking to correct or otherwise close-out the anomaly is suitable, but is not responsible for completing the action. If, in executing the action, the petroleum undertaking finds that substantially more work is required to rectify the anomaly, a new action and close-out date can be agreed with the ICB. The petroleum undertaking is responsible for completing the action.

¹⁸ This system of raising anomalies does not prevent an ICB from bringing to the attention of the petroleum undertaking any issue needing remedial action, or any improvement that should be considered for implementation that does not constitute an anomaly as soon as is reasonably practicable.

If the ICB and petroleum undertaking cannot agree on a suitable date for the closure of an anomaly, or on whether an anomaly has been suitably closed-out, the ICB must raise a 'verification reservation' to the petroleum undertaking, which is defined as:

A **verification reservation** is raised if the ICB and the petroleum undertaking cannot reach agreement on any part of a Verification Scheme, or on the timescale or action required for close-out of an anomaly.

All verification reservations raised must be notified to the CER by the petroleum undertaking within 1 week of being issued using the appropriate form¹⁹. For clarity, the requirement to notify the CER of a verification reservation is not satisfied by the safety performance reporting set out in section 3.

2.2.2.2 CER Process

On receipt of a verification reservation from a petroleum undertaking, the CER will identify and notify the action required, if any, by the petroleum undertaking to close the verification reservation. In deciding the appropriate action required, the CER may carry out an inspection or investigation in relation to the verification reservation.

2.2.3 ICB Review of Verification Scheme and Petroleum Undertaking Processes

The ICB must review the Verification Scheme and the petroleum undertaking's SCEs, performance standards and assurance processes if these:

- Have not previously been in operation on the installation or well;
- Is for a Non-production Installation coming into Irish jurisdiction; or
- Have been revised for any reason, in which case only the modified part needs review.

The review must cover the suitability of the:

- Chosen set of SCEs;
- Performance standards for these SCEs;
- Assurance (including maintenance, and inspection) routines used by the petroleum undertaking to ensure performance including their frequency;
- Assurance processes used in the management of SCE performance (e.g. operational risk assessment and deferred maintenance); and
- Verification Scheme itself, which must define suitable review that allows the ICB to make a judgement as to whether the petroleum undertaking is following their own assurance processes for the SCEs from design through to on-going operations.

Notwithstanding this, the ICB must also review the Verification Scheme as they work on it and raise anomalies in relation to it if it does not meet the requirements within this *Compliance Assurance System* document, or is otherwise unsuitable. This is especially important if there is a change in ICB.

If an ICB raises anomaly in relation to any of the five bullets above that the petroleum undertaking does not accept, and the difference of opinion cannot be resolved, a verification reservation must be notified to the CER (section 2.2.2).

¹⁹ The appropriate form is provided on the CER website.

2.2.4 ICB Verification Activities

2.2.4.1 Overview

A Verification Scheme must include all of the following:

- Review of design documents used to justify criteria in performance standards;
- Witnessing of tests;
- Visual examination;
- Review of maintenance and inspection records; and
- Review of procedures used in the management of SCEs such as deviations and dispensations.

The verification activities that need to be carried out and their frequency will vary between SCEs, also between different equipment items that make up an SCE, and the well. A suitable sampling approach may be adopted and guidance in relation to this is given in section 2.2.4.2.

2.2.4.2 Sample Size and Frequency of Verification

Verification is carried out by assessing and reviewing a cross-section of the petroleum undertakings processes used to define and maintain SCEs and well integrity such that risks are ALARP. Performance standards need to be defined by the petroleum undertaking for each safety critical function of each SCE,. Each function does not necessarily require to be verified every year, or every time a petroleum undertaking carries out maintenance on it. The sample size and frequency of reviewing a function of a SCE must be such that the ICB is carrying out sufficient verification over the installation to be able to satisfy itself that the SCE is initially and will continue to meet its performance standard, or well integrity will and is being maintained.

For many SCEs, there are a number of similar, or even identical, components in operation, e.g. gas detectors, pressure safety valves and petroleum-containing pipework. While the petroleum undertaking's assurance processes must cover all of these components on a regular basis, verification (during operations likely to be witnessing of tests and examination of maintenance records) only needs to be carried out on a sample of them at a frequency such that the ICB can be satisfied that the components either individually (e.g. PSVs, where each one must operate), or together (e.g. emergency lights, where normally only a proportion need to operate to meet the performance standard) meet the performance standard.

The frequency of verification of a particular function depends on the frequency of the petroleum undertaking's inspection and maintenance processes that provide assurance to the petroleum undertaking that SCEs are meeting their performance standards, and also varies for different types of verification, as illustrated in the example below. The verification of most performance standards may be by a combination of maintenance record review and visual examination or witnessing of tests, but the allocation between these activities varies for different SCEs.

Example

Pressure safety valves (PSVs) are normally inspected at intervals of between 1 and 6 years depending on the past performance and risk associated with non-operation of the PSV. On a typical offshore platform, or onshore site, there are several hundred PSVs meaning that sufficient certainty can be gained that inspection tests are being carried out correctly, and inspection records reflect actual tests, without witnessing all of the tests (which may or may not be carried out on site). The operational part of the Facilities Verification Scheme for PSVs must include at least (numerical values replaced by xx and yy):

- Witness the minimum of xx PSV and yy% of all PSV lift tests (pop tests) each year including, if any exist, some that failed their previous test;
- Annual review of appropriateness of PSV deferred maintenance assessment for minimum of xx PSVs and yy% of total deferrals (or all deferrals if fewer than this exist); and
- Bi-annual review of the petroleum undertakings assessment of PSV reliability.

The Verification Scheme must specify the extent of the testing of SCEs, i.e. a sample size. For any verification activity where a sample of records, or components is verified, the same sample must not be not repeatedly verified.

Example

The petroleum undertaking should consider the number of tests on components of an SCE that are required to be witnessed to allow the ICB to make a decision on whether the test is being carried out correctly and that sufficient certainty can be gained that the recorded test results mirror the actual test results. For example:

- A high integrity pressure protection system, preventing the over-pressurisation of a separator, may require the ICB to witness tests of 100% of the system; and
- A fire and gas detection system with many detectors may require the ICB to witness only a proportion of the detector tests (i.e. less than 100% of them).

2.2.4.3 Records of Verification

The petroleum undertaking must ensure that there are arrangements in place for making and keeping verification records for the lifetime of the installation showing:

- The ICB's review of the SCEs, performance standards, assurance routines and procedures and Verification Scheme (section 2.2.3);
- Verification activities carried out, such that it is clear what verification that has been carried out on what equipment, documents, or records, regardless of the outcome (i.e. positive reporting of all verification activities, not just when an anomaly is raised);
- The ICB's verification anomalies, including a record of the:
 - Anomaly itself
 - Planned date for closure of any anomaly;
 - ICB's acceptance of the closure of any anomaly; and
- The ICB's verification reservations.

2.2.5 Non-ICB Activities

2.2.5.1 Vessel Classification

Work done to satisfy vessel classification for mobile, offshore installations under the auspices of the International Maritime Organisation (IMO) may be used to satisfy aspects of a Verification Scheme. The petroleum undertaking must ensure that this work meets the requirements of the Verification Scheme, including suitable records being kept (see section 2.2.4.3), and that the organisation carrying out the work meets all the ICB requirements (see section 2.1). In this instance, the ICB and the petroleum undertaking must agree that the classification organisation meets all of the ICB requirements, including independence from the petroleum undertaking's assurance activities, and this assessment may be subject to inspection by the CER.

An example relating to vessel classification is given below.

Example

A MODU firewater pump test is witnessed by the vessel's classification society and found to meet all of the criteria in the performance standard. The Facilities Verification Scheme also requires an ICB to witness a firewater pump test. If the classification society meets the ICB requirements for this Verification Scheme, then its witnessing of the test will also satisfy this aspect of the Verification Scheme.

Note that this is only possible if the vessel classification activity covers all of the Verification Scheme requirements.

2.2.5.2 Notified Bodies

Under the Pressure Equipment Directive (PED) (97/23/EC) and ATEX Workplace Directive (99/92/EC), Notified Bodies check and review a manufacturer's processes such that the manufacturer is able CE mark a product, which confirms that it meets the relevant directive. If the directive is the criteria in the performance standard of an SCE, it is sufficient for the ICB to check the authenticity of the declaration of conformity for the equipment to confirm this aspect of the performance standard. The petroleum undertaking and ICB must agree that this is a suitable approach to allow the ICB to meet the requirements of the verification scheme and make a judgement as to whether the petroleum undertaking's assurance processes to meet the performance standard are operating as intended.

Example

A criteria in the performance standard for an item of pressure-containing equipment is that it meets the Pressure Equipment Directive (97/23/EC). This can be verified by a review of the declaration of conformity (with the Notified Body's name and number) and a visual inspection of the CE marking. For some equipment items, the verification scheme may require additional verification of welding qualifications or witness of pressure strength tests to be carried out by the ICB.

2.2.5.3 Other Code Requirements

Performance standards may include the requirement for equipment to meet a particular code that is recognised as meeting current Good Practice. Verification of this aspect can be by reviewing and confirming the applicability of work undertaken by another third party that meets the ICB requirements in section 2.1. The petroleum undertaking and the ICB must agree that the other party meets the independence requirements for an ICB and, regarding competency, that they are accredited to recognised standards in Ireland (e.g. ISO9010 and ISO17020) that means that they meet the ICB competency requirements for their workscope.

This party does not need to be approved by the CER, but may be subject to audit and inspection if used in the verification process. This arrangement can only cover verification of adherence to a recognised code in Ireland and so is unlikely to cover all the SCE requirements for a particular SCE.

Two examples are given below where verification can and cannot be carried out by review of another party's work.

Example

The verification that emergency lighting meets a particular code as required by its performance standard can be made through review of documentation from another party (meeting the ICB requirements) that it meets the code.

Verification of the time that the emergency lighting operates needs to be made by the ICB witnessing a test.

Example

The performance standard for a production tree states that it needs to be rated to 10,000psi. This can be verified by checking that there is a valid third party certification (from a third party that meets the ICB requirements) that states that the production tree is rated as such.

The wing valves in the same production tree need to close in 30s, which must be verified by witnessing of a test during the commissioning process.

2.3 Safety Case Content, Linkage with Safety Permits and Timings

2.3.1 Safety Case Content

Verification Scheme(s) must be described or referenced in the safety case in accordance with Table 1.

Safety Case	Documentation Requirements for the Verification Schemes
Design Safety Case	A summary of the Facilities Verification Scheme that will be implemented during design (as per the requirements in sections 2.2.1 and 2.4).
Production Safety Case	<p>The Facilities Verification Scheme and Well Verification Scheme must be referenced in the safety case and meet the requirements in sections 2.2.1, 2.4 and 2.5.</p> <p>The safety case must state that design and construction Facilities Verification²⁰ and Well Verification up to production have been completed and summarise the work done to achieve this.</p>
Non-production Safety Case	<p>The Facilities Verification Scheme must be referenced in the safety case and must meet the requirements in sections 2.2.1 and 2.4.</p> <p>The safety case must state that a process that meets the same aims as design and construction verification has been completed as detailed in section 2.3.4.3 and summarise the work done. If for reasons of practicality this verification work cannot be completed for when the safety case is submitted, it will be subject to an Additional Information Request, which may impact the timescale for safety case assessment. In any event, a Well Work Safety permit will not be issued until this verification has been completed, information sent to the CER and the submission assessed.</p>
Decommissioning Safety Case	The Facilities Verification Scheme and Well Verification Scheme must be referenced in the safety case and meet the requirements in sections 2.2.1, 2.4 and 2.5.
Well Work Safety Case	A statement that the design part of the Well Verification Scheme has been completed and a summary of this must be included in the safety case. The Well Verification Scheme for the remaining steps of verification (Well Work Activity to abandonment) must be referenced in the safety case and meet the requirements in sections 2.2.1.2 and 2.5.

Table 1: Verification Scheme documentation requirements for the safety case

²⁰ If, for reasons of practicality, this cannot be completed before submission of the safety case, it will be made a condition of the safety permit. It is not required for established petroleum infrastructure. If a Design Safety Case is not required, this applies to a process that achieves the same aims as design verification (see section 2.4.1).

2.3.2 ICB Submission Timings

2.3.2.1 Design Safety Case

The ICB submission must be made at the same time as, or before, the Design Safety Case is submitted to the CER.

2.3.2.2 Well Work Safety Case

The ICB must be approved by the CER by the time the Well Work Safety Case is submitted.

2.3.2.3 Other Safety Cases

For all other safety cases, approval of ICB(s) by the CER is required in order for the associated safety permit to be issued, or approval will be made a condition of the safety permit. The timing of the ICB submission must be made to enable this, but should not be before the submission of the safety case itself.

2.3.3 Production Safety Permit

For a new installation, a Facilities Verification Scheme must apply from 4 weeks after the time a Design Safety Case is submitted.²¹ From then until a Production Safety Permit is issued, the Facilities Verification Scheme must cover (see section 2.4 for details):

- Design, construction and commissioning (up to the point at which a Production Safety Permit is required).

Once the Production Safety Permit has been issued, the Facilities Verification Scheme must cover all the SCEs and assurance processes that are used in the management of SCE performance (e.g. operational risk assessment and deferred maintenance) for the designated petroleum activities (excluding wells covered under a Well Verification Scheme, but including commissioning activities that require a Production Safety Permit) that are carried out under that safety permit. The requirements of the Facilities Verification Scheme during production are given in section 2.4.3.

A Well Verification Scheme must be in operation for all wells operated under a Production Safety Permit (see section 2.5.3 for details).

The above requirements also apply to mobile installations that are brought into Ireland for production.

Verification must be carried out for all material changes.

²¹ Where a Design Safety Case is not required, this will be from the point at which the Production Safety Case is submitted, with a requirement to show that a process that achieves the same aims as design verification has been successfully completed or will be successfully completed (see section 2.4.1).

2.3.4 Well Work Safety Permit

The verification requirements are split into those for the well itself and those for a non-production installation or production installation depending on which type of unit is carrying out the Well Work Activity.

2.3.4.1 In Relation to the Well

Verification of the design of the well (including how it will be drilled), in accordance with the requirements in section 2.5.1, must be completed prior to submission of a Well Work Safety Case and from this point until well abandonment, a Well Verification Scheme must be in operation regardless of the permit that the well is being operated under.

Verification must be carried out for all material changes in relation to a well.

A suspended well remains subject to verification under a Well Verification Scheme. The requirements of the Well Verification Scheme during suspension are given in section 2.5.4.

The requirements of the Well Verification Scheme for a Well Work Activity that covers abandonment are given in section 2.5.5.

2.3.4.2 In Relation to a Production Installation

If a Well Work Activity is to be carried out from a Production Installation, the Production Installation will be subject to a Facilities Verification Scheme as detailed in section 2.4.3. The combination of this and the Well Verification Scheme must cover the SCEs relating to the Well Work Activities.

2.3.4.3 In Relation to a non-Production Installation

In the case of well work to be carried out from a Non-production Installation, verification by the ICB before the Well Work Activity commences must include:

- Verification that the chosen set of SCEs and their performance standards (termed initial suitability) are such that the risk from the hazards managed by them is ALARP;
- Verification that the SCEs are capable of meeting their performance standards, which can be carried out by confirmation of successful maintenance or testing, or direct witnessing of tests (for a suitable sample of each SCE). Work done previously (e.g. previous class or flag state surveys for a floating installation) may fulfil some of these requirements; see section 2.2.5 for further guidance;
- Verification that the assurance process for the SCEs are suitable;
- Verification that assurance procedures (e.g. operational risk assessment and deferred maintenance) are suitable; and
- Review of the Facilities Verification Scheme against the requirements of section 2.2.3.

The above verification must be complete before a Well Work Permit can be issued.

An operational Facilities Verification Scheme for the Non-production installation, following the guidance in section 2.4.3, must operate from the time the Well Work Activity commences. This is in addition to the requirements for a Well Verification Scheme for the well that the Well Work Activity relates to.

Verification must be carried out for all material changes on a Non-production Installation.

2.3.5 Decommissioning Safety Permit

In relation to decommissioning, Verification Schemes must be in place while the Decommissioning Safety Permit is in force. It must cover relevant operational aspects and take account of any changes from the verification activities that were carried out during production.

2.4 Facilities Verification Scheme Requirements

An ICB submission for Facilities Verification must be made at the same time as the Design Safety Case is submitted²². Thus, on-going from 4 weeks after the Design Safety Case is submitted, the ICB must verify that the design will deliver risks that are ALARP, performance standards for the chosen SCEs are suitable to reduce the risk to ALARP and that the SCEs will be capable of meeting their performance standards when commissioned and on an on-going basis.

The requirements for the Facilities Verification Scheme during design, construction (including commissioning up until the point when a Production Safety Permit is required), and production²³ are given below.

2.4.1 Design

Design covers the process of determining what will be constructed and how it will be operated.

The ICB must verify that the *ALARP Guidance* has been followed with respect to the decisions that have been made as to the choice of SCEs, their performance standards and ALARP consideration of safety critical risk reduction measures. The verification need not repeat the work done by the designer, but it must be in sufficient detail for the ICB to be satisfied that the design will meet these requirements. To do this, the ICB must review a suitable sample of the documentation, calculations etc that are part of an ALARP demonstration or justification for the chosen performance standards and not merely rely on the reputation, or past experience of the organisation that has carried out the analysis.

²² Unless the design safety case relates to a material change and the ICB has independence and competence to verify the work involved with the material change.

²³ The split into these areas is given to aid the description of the requirements, but does not necessarily mean that the Verification Scheme must be split in the same way.

Example

If a tie-back to an offshore installation does not have a subsea isolation valve (SSIV) on the pipeline, the ICB should review the ALARP assessment for this decision and check any risk calculations used in it. If there is an SSIV and it is given a performance standard for maximum allowable time to close, the ICB should verify this time, but it is less likely that this needs to include a review of calculations since reasonable changes in closure time are likely to be less critical than whether a SSIV exists at all.

Example

Petroleum containing pressure vessels are safety critical and, for a sample of the pressure vessels, calculations for the strength would need to be checked such that sufficient certainty in the correctness of them all can be gained. Use of a suitable software package may mean that less checking is needed to gain sufficient certainty. In some instance this may involve repeating calculations.

2.4.2 Construction**2.4.2.1 Overview**

Before a Production Safety Permit is required, the ICB must have verified that each SCE meets its performance standard. This verification may be by a combination of document review (e.g. testing records, technical deviations, close-out packs, etc) and witnessing (e.g. commissioning tests to demonstrate that performance standards are met). The combination of review, witnessing and examination must be such that the ICB can gain confidence that the SCEs are meeting their performance standard initially. Two examples of the mix of activities that provide this confidence are given below.

Example

Additional emergency lighting is being provided for a new module on an offshore platform. In this case, the verification activities must include at least:

- Through review of procurement records, that the lights meet the code required in the performance standard;
- Once the emergency lights are installed:
 - That they operate for the required time on loss of normal power; and
 - Witness that the lighting levels defined in the performance standard are achieved.

2.4.2.2 Timing

Verification must not be left until the end of the construction process so as to improve the possibility of resolving anomalies satisfactorily and avoiding any tendency to accept the degraded situation that led to the anomaly being raised. Verification must be carried out throughout the construction process from the end of design through to when a Production

Safety Permit is required, including commissioning of those SCEs that can be commissioned without a Production Safety Permit. Verification is likely to be carried out in stages, but the full verification scope must ensure that all the performance criteria defined in the performance standard are verified.

Example

Gas detector locations and their response time (as required by the performance standard) must be verified by witnessing a suitable test once installed in location.

Example

Verification of a new riser ESD valve must include witnessing of:

- Pressure test of the valve at its place of fabrication to determine whether its passing rate meets the performance standard; and
- Test of the time taken for the valve to close once installed on site to determine whether it meets its performance standard.

In order that the ICB identifies anomalies as early as possible, some verification may be carried out at the procurement stage, such as review of a suitable sample of procurement documents (e.g. procurement orders, datasheets and delivery notes, etc). This may prevent an anomaly from only being identified during the commissioning stage when it is more difficult to rectify.

2.4.3 Production

A Facilities Verification Scheme during the production phase must include all of the following:

- Witnessing of tests;
- Visual examination;
- Review of maintenance and inspection records; and
- Review of related assurance procedures (e.g. deferral, operational risk assessment).

Guidance in relation to these methods is given below.

2.4.3.1 Witnessing of Tests

Where SCEs have an active performance standard (e.g. activation of deluge, detection of flammable gas, etc) the ICB must witness a sample of the petroleum undertaking's testing of the SCEs. The purpose of witnessing a test is to verify that it is being carried out correctly and that the results recorded are accurately reflected in the maintenance management system in order that sufficient certainty can be gained in the operation of the maintenance management system.

Example

The active performance standards that require the ICB to be physically present to witness tests include, but are not limited to:

- Emergency shutdown valve closure time;
- Emergency shutdown valve leakage rate;
- Fire water pump starting methods;
- Fire water pump flow rate;
- Gas detector response time; and
- Gas detector alarm levels.

2.4.3.2 Visual Examination

Where SCEs have a passive performance standard (e.g. dimensions, quantity, condition, etc) the ICB must visually examine a sample of the SCEs.

Example

Passive performance standards that require the ICB to visually examine the SCE include, but are not limited to:

- Escape routes;
- Emergency exit doors;
- Blast walls; and
- Passive fire protection.

2.4.3.3 Review of Maintenance and Inspection Records

As part of the verification process, the ICB must review the petroleum undertaking's maintenance and inspection records to confirm that the assurance process is robust and that scheduled maintenance and inspection has been completed on time and in accordance with documented procedures.

As part of checking the records, the ICB must verify that the scheduled maintenance will reveal any failure mode of the SCE such that preventative or remedial action can be carried out by the petroleum undertaking. The ICB must also review the frequency of a particular maintenance activity to ensure that it is appropriate, taking into account as appropriate the:

- Historical failure rate of the equipment; and
- Risk resulting from failure occurring accounting for the level of redundancy against such a failure.

As part of the review of maintenance and inspection records, the ICB must review the application of any procedures that are used to defer maintenance.

The ICB must review that the maintenance and inspection records refer to the as-found condition of the equipment and identify any remedial action that was required to reinstate SCEs or well integrity to meet the required performance standards.

Review of maintenance records must also be carried out in order to verify whether reliability criteria within the performance standards are being met. This is likely to be done on a sample basis (see section 2.2.4.2 for further details).

2.4.3.4 Review of Operational Deviations

The ICB must verify that risk assessments used to justify continued operation with a failed SCE (often termed operational risk assessment or deviation) are suitable and consider:

- The risks associated with the failure of the SCE;
- The impact of deviations or dispensations from the petroleum undertaking's policies or procedures; and
- How the risk remains ALARP, taking into account any additional risk reduction measures that are implemented.

In verifying this, the ICB must also review whether the petroleum undertaking's procedures to manage SCE failures and associated deviations or dispensations are adequate.

2.4.4 Decommissioning

The Verification Scheme(s) must take account of any changes from the verification activities that were carried out during production.

Records must be retained after decommissioning, according to the requirements in section 2.2.4.3.

2.5 Well Verification Scheme Requirements

The requirements for the Well Verification Scheme apply to all wells both offshore and onshore, including those wells that have been suspended and are planned to be abandoned.

A well is defined in terms of its pressure boundary. Any equipment used to control or contain the well pressure must be included in the Well Verification Scheme. This includes both downhole equipment for well pressure containment and equipment at or above the surface such as the wellhead, blow-out preventer (BOP) and/or the production tree (see section 1.3.3 of the *Safety Case Guidelines*).

The emphasis of the Well Verification Scheme is to ensure that the well design and the associated Well Work Activities are appropriate for the geological conditions anticipated and that the use of any pressure control equipment proposed is fit for purpose, in order to eliminate uncontrolled escape of fluids from the well and ensure that risks are ALARP.

The requirements for the Well Verification Scheme during design, Well Work Activities,

production, suspension and abandonment²⁴ are given below. This will include the review of relevant policies and procedures used by the petroleum undertaking and its contractors as far as they affect the well integrity and operation of well-related SCEs.

2.5.1 Design

The ICB must verify the well design including the design of the drilling process for the Well Work Activity. This verification must be by review of design documents (e.g. well engineering drawings, equipment specifications, calculations, datasheets, etc) and may include checking some design calculations. The well and drilling process will be designed within a certain envelope in which the petroleum undertaking has assessed the risk to be ALARP. Verification must cover the range of possibilities within the defined envelope and must confirm that well integrity will be maintained and the SCEs will meet the performance standards such that hazards are managed and risks ALARP.

Verification must cover all aspects of the well design pertaining to its integrity and SCEs, including a review of at least:

- The assessment and prediction of subsurface conditions to ensure that all relevant information has been considered;
- The casing and cement design and specification;
- The proposed mud properties to ensure that they are suitable to achieve well control;
- Direct pressure and temperature measurement and/or use of predictive methods to verify anticipated geological conditions;
- Pressure testing methods proposed to demonstrate integrity, including their suitability and frequency;
- The design and specification of pressure control equipment, taking into account anticipated subsurface pressure and temperature conditions; and
- How well abandonment will be achieved.

2.5.2 Well Work Activities

The ICB must verify that the Well Work Activity is carried out in accordance with the design and the well programme. This verification must be by a combination of review of a suitable sample of documents (e.g. drilling procedures, material certificates of casing, installation procedures, and testing records) and witnessing of the Well Work Activity by at least one visit by the ICB to the well site. This must include, but is not limited to, verification that:

- The material/equipment that is to be placed in the well (e.g. casing) meets the design requirements. This may be carried out by an external party as outlined in section 2.2.5.2 and the requirements of that section also apply here.
- The installation and pressure testing of the well casings and cement to ensure that no leak paths exist;
- The periodic assessment of actual subsurface conditions (e.g. leak-off test, formation integrity test, pore pressure prediction and actual pore pressure measurements using formation evaluation tools) and any consequent changes to the well design are being

²⁴ The split into these areas is given to aid the description of the requirements, but does not necessarily mean that the Verification Scheme must be split in the same way.

- carried out;
- Well control procedures (including periodic BOP testing and emergency drills) during the construction process are appropriate; and
- The well has been suitably completed by examination of the final pressure containment logs and, as appropriate, handover documentation that signifies the end of the Well Work Activity.

2.5.3 Production

The ICB must verify the petroleum undertaking's process for ensuring operation of SCEs and well integrity is maintained at all times through implementation of a suitable well integrity management system. This must cover all wells, including those that are suspended, and verification of routine operation and maintenance activities for wells that do not fall under the definition of Well Work Activity. This verification must cover at least review of:

- Preventative maintenance of above ground pressure control equipment, condition monitoring, inspection and maintenance of the well completion;
- Inspection and testing of safety critical valves (e.g. subsurface safety valves, gas lift valves, production master valves); and
- Deviations from normal operations.

Verification may be by document review, or witnessing of tests. There must be some witnessing of the operation of safety critical valves (see section 2.2.4 for how this may also be covered by a Facilities Verification Scheme).

2.5.4 Suspension

The ICB must verify the petroleum undertaking's process for monitoring the integrity of any well that is suspended. This verification may be by a review of a suitable sample of documents (e.g. well suspension procedures, review of inspection records or examination of periodic video records).

2.5.5 Abandonment

For the process of abandoning a well, the same verification requirements apply as for any other Well Work Activity.

In addition, the ICB must verify that the well has been suitably sealed so as to permanently maintain its pressure boundary by a review of a suitable sample of documents (e.g. abandonment procedures and records and pressure test results). The ICB must verify that the process for re-pressurisation of all the formations to virgin pressure, potential changes in fluid composition in the wellbore and the deterioration of well over time have been taken into account.

Once a well has been abandoned it will not be subject to verification.

3 Safety Performance Reporting

Petroleum undertakings must monitor and report on safety performance.²⁵ This is in addition to the petroleum incident reporting required under the Act.²⁶ This safety performance reporting provides the CER with data on each petroleum undertaking's safety performance on an on-going basis. The CER uses the data to monitor trends, recognise good practice and identify areas for audit and inspection. Safety performance reporting assists the CER in monitoring compliance by petroleum undertakings with their obligations under the Act and the Framework, and their compliance with the approved safety case and the associated safety permit.

Petroleum undertakings carrying on designated petroleum activities must measure and report safety performance indicators as detailed below to the CER every quarter from the time a safety permit is issued. The CER may also include additional indicators as specific requirements of a safety permit.

The safety performance indicators listed here are additional to any other indicators that petroleum undertakings monitor to assess the adequacy of their own systems.

3.1 Safety Performance Indicators

Safety performance indicators to be reported to the CER include leading and lagging safety performance indicators:

- **Leading safety performance indicators** are produced from active monitoring of risk reduction measures to ensure their continued effectiveness; and
- **Lagging safety performance indicators** are incidents as defined in the Act, *Petroleum Safety (Petroleum Incident Regulations)* and *Incident Reporting Guidance*.

Table 2²⁷ and Table 4 define the safety performance indicators that must be reported to the CER. For events or occurrences for which notification to the CER is required under the Petroleum Incident Regulations,²⁸ the associated incident report reference number(s) must be provided in the safety performance report. An incident must be recorded against all relevant safety performance indicators, e.g. a major injury caused by a worker falling overboard from an offshore Facility would be tallied under safety performance indicators B1 and F9.

Error! Reference source not found., which is applicable to indicators F2 and F3, shows the classification of releases for petroleum and non-petroleum liquids and gases, which is as per the *Incident Reporting Guidance*. Table 5 shows the supporting data that must be reported to the CER to enable analysis of data from different petroleum undertakings to be carried out.

²⁵ Section 13L(3)(f) of the Act.

²⁶ Section 13A(1) of the Act and the *Petroleum Incident Regulations*.

²⁷ See the *Incident Reporting Guidance* for additional guidance on these indicators.

²⁸ Submitting safety performance indicators relating to Reportable Petroleum Incidents does not constitute notification to the CER under the Petroleum Incident Regulations.

In the table, a distinction is made between a worker and a non-worker. Persons carrying on an activity in relation to the operation or activities of the petroleum undertaking are workers. Any other person (such as visitors to the site that are not engaged in a petroleum activity, or members of the public) is classed as a non-worker.

Section 3.2 describes how the reporting is to be carried out.

ID	Safety Performance Indicator
A1	Number of worker fatalities resulting from a designated petroleum activity
A2	Number of non-worker fatalities resulting from a designated petroleum activity
B1	Number of injuries to workers resulting from a designated petroleum activity
B2	Number of injuries to non-workers resulting from a designated petroleum activity
B3	Number of workers affected by an occupational illness or disease
C	Number of occurrences of damage to the structural integrity of petroleum infrastructure that requires an immediate change in operations, response or action
D1	Number of occurrences of subsidence, or collapse of the seabed, likely to affect the foundation of a Facility or pipeline
D2	Number of occurrences of the structural integrity of petroleum infrastructure being compromised not accounted for in D1
F1	Number of uncontrolled fires or explosions
F2	Number of uncontrolled releases of petroleum gas that meet either the Major, Significant, or Minor thresholds
F3	Number of uncontrolled releases of petroleum liquid that meet either the Major, Significant, or Minor thresholds
F4	Number of uncontrolled releases of a non-petroleum hazardous substance that did or could have resulted in a fatality or a serious injury
F5	Number of uncontrolled releases from a well of fluids other than petroleum
F6	Number of occurrences of loss of mooring, stability or buoyancy of a vessel
F7	Number of collisions by a vessel, vehicle, crane, helicopter or aircraft with any petroleum infrastructure
F8	Number of unforeseen instances of a stand-by vessel being unable to be in a position to provide rescue to persons on offshore petroleum infrastructure regardless of whether it was required
F9	Number of occurrences of a person falling into the sea
F10	Number of occurrences of mustering on onshore or offshore petroleum infrastructure, other than for planned drills

ID	Safety Performance Indicator
F11	Number of evacuations of onshore or offshore petroleum infrastructure, other than for planned drills
F12	Number of activations of a blow-out prevention, diversion system, or any other emergency shutdown device to provide well control
F13	Number of occurrences of positive flow indication from a well as a result of an unplanned fluid influx
F14	Number of occurrences of detection of hydrogen sulfide in the course of operations at a well or in samples of well-fluids from a well where the presence of hydrogen sulfide in the reservoir being drawn on by the well was not anticipated
F15	Number of failures to maintain a planned minimum separation distance between two or more wells
F16	Number of occurrences of the collapse, overturning, or failure of any load-bearing part of any lift, hoist, crane, or derrick
F17	Number of failures of any equipment associated with a well undergoing Well Work that would cause or contribute to, or whose purpose is to prevent or limit the effect of the unintentional release of fluids from the associated well or reservoir
F18	Number of incidents that leads to damage of property not in the ownership of the petroleum undertaking outside the boundary fence of an onshore site
F19	Number of occurrences of dropping of an object that did, or had the potential to cause a petroleum incident under (a) to (e) of the definition of petroleum incident contained in section 13A(1) of the Act of 1999 and i to xviii of the definition of prescribed occurrence under the <i>Petroleum Safety (Petroleum Incident) Regulations 2013</i>

Table 2: Lagging safety performance indicators

Category	Mass of Gas Released	Volume of Liquid Released
Major	≥300 kg	≥300 litres
Significant	≥1 kg and <300 kg	≥60 litre and <300 litres
Minor	0.1 kg and <1 kg	≥5 litres and <60 litre
and for any category	Release Rate >3 kg/hr	Release Rate >100 litres/hr

Table 3: Classification of releases (as per Guidance for Reporting Petroleum Incidents)

ID	Safety Performance Indicator	Guidance
L1	Number of anomalies raised by ICB(s) in the previous 12 months	This safety performance indicator is reported every quarter for the previous rolling 12 month period. Details of the anomalies raised are not required to be reported.
L2	Number of verification anomalies that were not closed-out by the planned due date at the end of the quarter	
L3	Number of verification reservations that were not closed-out by the end of the quarter	
L4	Number of activations of an SCE	
L5	Number of SCEs with incomplete maintenance past a planned completion date at the end of the quarter	This is commonly called maintenance backlog. For this safety performance indicator, SCEs are counted in terms of discrete items, e.g. if 10 gas detectors have not had planned maintenance completed, 10 is reported
L6	Number of SCE maintenance hours required to remedy any backlog in safety performance indicator L5	
L7	Number of SCEs not meeting their performance standard at the end of the quarter	SCEs are counted as per safety performance indicator L5. Failure to meet any part of the performance standard is counted here
L8	Number of planned emergency drills not carried out within the quarter	

Table 4: Leading safety performance indicators

Description		Supporting Data
Man-hours worked	Total man-hours worked on petroleum activities during the quarter	

Table 5: Supporting data

3.2 **Format and Frequency of Reporting**

Petroleum undertakings must submit a report on the safety performance indicators to the CER in electronic format²⁹. The report must include a summary narrative on the safety performance indicators for the period covered, for example, giving reasons for the parameter being higher, lower, or similar to previous reporting periods. For Reportable Petroleum Incidents, an incident number must be given that cross-refers to the report made to the CER. The reporting parameters must be given in relation to each safety permit.

Petroleum undertakings are required to report the safety performance indicators to the CER on a quarterly basis within 6 weeks of the quarter ending, as in Table 6. Reporting of this data to the CER in these timeframes will be a condition of all safety permits.

Reporting Quarter	Latest Submission Date
1 January – 31 March	14 May
1 April – 30 June	14 August
1 July – 30 September	14 November
1 October – 31 December	14 February

Table 6: Safety performance indicator reporting deadlines

Petroleum undertakings must ensure that the systems in place for gathering the data for the safety performance indicators are robust. Petroleum undertakings must retain data relevant to the safety performance indicators. The CER may confirm the accuracy of the performance reporting data provided by a petroleum undertaking through audit and inspection (section 5).

²⁹ The appropriate form is provided on the CER website.

4 Independent Safety Case Review

Petroleum undertakings must review their safety case(s) in specific circumstances, as described in section 13N(2) of the Act, as follows:

- a) At least every 5 years;
- b) Whenever such a review is necessary because of new facts or to take account of new technical knowledge about safety matters;
- c) Whenever such a review is necessitated arising from (i) reports relating to audits (ii) reports on safety performance and compliance;
- d) In circumstances where the petroleum undertaking considers it appropriate to do so;
- e) Where the CER issues a notice in writing to a petroleum undertaking requiring it to do so; or
- f) Where a change is made to the safety management system which could significantly affect the ability of the petroleum undertaking to comply with its duty to reduce the risks to ALARP.

Where the review of the safety case is required to meet the obligation to carry out a 5 yearly review (as at (a) above), or in circumstances where the CER has directed the review (as at (e) above), a petroleum undertaking must direct an Independent Safety Case Review by an organisation termed an Independent Review Body (IRB), according to the requirements of this section of the *Compliance Assurance System* document. The IRB must be approved by the CER before the review commences.

An Independent Safety Case Review may also be a condition of a safety permit.

The safety case is a working document and so must represent current operations at all times. The purpose of an Independent Safety Case Review is to confirm that the:

- Safety case continues to demonstrate that all risks to safety have been reduced to ALARP, in the light of changes in Good Practice, improvements in technology or other advances (e.g. new facts or to take account of new technical knowledge about safety matters);
- Safety Management System (SMS) is being implemented as it is described in the safety case; and
- Verification processes are being implemented as described in the safety case.

Although the Independent Safety Case Review will necessarily consider past performance, fundamentally it is a forward-looking process, which is intended to allow the petroleum undertaking to review its processes, ensure that its procedures are being fully applied as described in the safety case, and identify any improvements required to the petroleum infrastructure and/or SMS for the risks to safety to remain ALARP.

The intention of the review is not to find issues that would be identified by the petroleum undertaking, or the ICB during the course of their normal business, but to review whether the risk as described in the safety case will be ALARP given changes that have occurred over the preceding 5 years and may occur over the next 5 years.

This section of the *Compliance Assurance System* document sets out the requirements to be followed by petroleum undertakings for the Independent Safety Case Review:

- Independent Safety Case Review Timing (section 4.1);
- Appointment of an IRB by a Petroleum Undertaking (section 4.2);
- General Requirements (section 4.3);
- Technical Requirements (section 4.4); and
- Content of the Independent Safety Case Review Report (section 4.5).

4.1 Independent Safety Case Review Timing

The petroleum undertaking is responsible for completing the Independent Safety Case Review. For a review instigated by the 5 yearly process, a review report must be submitted within 5 years of the last review being approved by the CER. The example box below illustrates a typical schedule for a petroleum undertaking to complete such a 5 yearly review. For an Independent Safety Case Review directed by the CER, the timescale in which it must be completed will be specified.

Example

For an Independent Safety Case Review of a Production Safety Case, the review may progress as follows:

- 0–2 months: The petroleum undertaking selects the IRB and submits their choice to the CER;
- 3–8 months: The Independent Safety Case Review takes place and the list of findings is prepared and action close-out dates agreed with the IRB (during this time some actions may be closed-out and, if relevant, may be included in the Independent Safety Case Review report as recent improvements);
- 9–12 months: The Independent Safety Case Review report is prepared and submitted to the CER. The safety case is also updated as a result of the review and goes through the material change process as necessary

4.2 Appointment of an IRB by a Petroleum Undertaking

4.2.1 Submission to the CER

The Independent Safety Case Review must be carried out by an organisation, or a number of organisations that are competent and independent. Such a body is termed an Independent Review Body (IRB). The IRB(s)³⁰ must have individuals, who between them have the competencies to complete the requirements defined in this section.

³⁰ Note that the singular IRB is used in the remainder of this document, but this does not disallow the possibility of the petroleum undertaking to use more than one IRB to cover the required review scope.

Before commencing an Independent Safety Case Review, the petroleum undertaking must submit information relating to their choice of IRB to the CER for approval³¹ using the appropriate form.³² The CER will approve the IRB on the basis of the evidence provided in the submission. The CER will inform the petroleum undertaking whether approval is given as soon as is practicable, but in any event no later than 4 weeks after receipt of the submission.

In the submission, the petroleum undertaking must:

- Provide confirmation that the IRB is certified to ISO 9001, or provide a demonstration that the IRB operates a quality management system that meets the same goals (for all work under the Independent Safety Case Review);
- Describe how the independence of the IRB meets the requirements in section 4.2.3;
- Describe any previous and current associations between the petroleum undertaking and the IRB, any potential conflicts of interest and outline how such issues are managed; and
- If more than one IRB is used, how they cover the required review scope between them.

The CER will approve the petroleum undertaking's choice of IRB if they meet these criteria.

4.2.2 Competence Guidance

Guidance in relation to two components of competency are given:

- The competence of individuals employed by the IRB; and
- The system the IRB has in place to manage competency.

4.2.2.1 Individuals

Individuals within the IRB that carry out the review must have suitable knowledge, experience and training to be competent to carry out the tasks allocated to them for the type of petroleum infrastructure being assessed.

4.2.2.2 Competency System

The IRB must ensure the competency of individuals through procedures that detail how competency is evaluated and managed. These procedures must include:

- Job descriptions that state minimum qualifications and minimum experience requirements;
- A definition of the required competence;
- Periodic assessments that evaluate continuing competence and identify training requirements;
- Training records to be made and maintained; and
- A procedure for the selection of persons with competency appropriate to the task, which could take the form of a competency matrix showing the aspects of the review that specific persons are competent to undertake.

³¹ The CER's approval in no way relieves the petroleum undertaking of any responsibility under the Act, or of its responsibility to ensure that the Independent Safety Case Review is carried out by suitable independent and competent persons.

³² The appropriate form is provided on the CER website.

4.2.3 **Independence**

The IRB's persons carrying out the review activities must:

- Be impartial and free from direct financial or operational pressures, which could affect their judgement;
- Not review their own work;
- Not be employed directly by the petroleum undertaking (or any constituent member thereof), its parent company or a company in the same group;
- Not, if a person is working for an ICB for the installation being reviewed, or any constituent member of such a company, its parent company or a company in the same group, review the work of that organisation; and
- Not, if a person is working for an organisation identified in section 4.2.5 of the *Safety Case Guidelines*, or any constituent member of such a company, its parent company or a company in the same group, review the work of that organisation.

4.3 **General Requirements**

4.3.1 **Independent Safety Case Review Scope**

The scope of the Independent Safety Case Review must include, but may not be limited to:

- How changes in technology, Good Practice etc have been reflected in the design and operational parameters of the petroleum infrastructure;
- How maintenance, inspection and testing of SCEs are ensuring that risks are ALARP;
- Whether changes to the petroleum infrastructure have been managed such that the risk is still ALARP;
- Whether there have been any detrimental changes to SCEs or their performance;
- Whether lessons are being learnt from incidents and abnormal or unexpected events;
- How the petroleum undertaking has ensured that the risk continues to be ALARP considering:
 - New knowledge and understanding;
 - Changes to risk assessment techniques and assumptions;
 - Safety critical changes to codes and standards;
 - Further risk reduction measures that must be implemented (see section 4.2.3 of the *ALARP Guidance* document); and
- Changes in management of safety and human factor aspects affecting the designated petroleum activities.

4.3.2 **Workforce Involvement**

The workforce, including safety representatives, must be consulted and involved in the Independent Safety Case Review to allow them to identify further risk reduction measures of procedures, systems and hardware for consideration.

The petroleum undertaking, in conjunction with the IRB, must decide how the workforce will be involved in the Independent Safety Case Review. Ways of achieving this include ALARP workshops (see example box below), and/or interviews and observations of working practices at the Facility. It is important that open discussions take place between persons from the IRB and the workforce.

Example

ALARP workshops are structured brainstorming exercises used to identify potential risk reduction measures that are needed to ensure that the risk remains ALARP in light of new technology etc and are a structured opportunity for the workforce to have a positive impact on safety.

ALARP workshops should be arranged to allow onshore and offshore workforce to participate. The workshops should be independently chaired. The scope of the workshop should include discussion of potential improvements to procedures, systems and hardware including those that eliminate, prevent, detect, control and mitigate Major Accident Hazards and may take into account aspects such as:

- The condition of the system;
- Possible improved arrangements on other installations that could be considered on the installation being reviewed;
- Safety performance indicators and trends;
- Incidents that may have been prevented by improved SCEs;
- Changes in operations and conditions;
- Changes to the plant and the process;
- Changes in organisational arrangements;
- Maintenance records indicating the condition of equipment and work to ensure its integrity;
- Audit and inspection reports;
- Changes in Good Practice, including new knowledge and technology;
- The management of human factors; and
- Issues arising due to ageing and obsolescence.

Information from the other parts of the Independent Safety Case Review can be fed into the ALARP workshops to help seed ideas for risk reduction measures.

Any findings that arise from the workforce consultations must be collated for consideration (see section 4.3.3).

4.3.3 Findings and Reservations

4.3.3.1 IRB and Petroleum Undertaking Process

In carrying out the Independent Safety Case Review, the IRB identifies 'findings',³³ which are defined as follows:

A **finding** is a failure identified by the IRB of either the petroleum undertaking's systems or operations with respect to the safety case and associated documents, or a further risk reduction measure that must be considered, and then potentially implemented, for the risk to remain ALARP.

³³ This system should not prevent an IRB from bringing to the attention of the petroleum undertaking any issue that they identify and consider needs remedial action, or is an improvement that should be considered for implementation as soon as possible.

Where a finding is raised, a response by the petroleum undertaking is required, and action must be considered, and potentially taken by it to close the finding.

Identification of findings are the main focus of the Independent Safety Case Review. For any finding raised, the petroleum undertaking and IRB must agree the action required to close out the finding, which will be by:

- Completion of a suitable change to a hardware or procedural system or similar; or
- An assessment to determine whether an additional risk reduction measure identified in the finding is needed for the risk to remain ALARP.

The petroleum undertaking must obtain the IRB's agreement on the planned action for each finding and their closure date, which must be as soon as is reasonably practicable. The petroleum undertaking is responsible for completing the work identified in the action.

Where a finding is closed-out by the petroleum undertaking carrying out a technical assessment, that assessment may result in an action (i.e. a change made to a hardware or procedural system or similar). If the result of the technical assessment is not known when the Independent Safety Review is concluded, then the timescale for completion of this action does not need to be agreed by the IRB.

If the IRB and petroleum undertaking cannot agree on a suitable date for an action to close a finding, or on whether the action, or finding is suitable, the IRB must raise a 'review reservation', which is defined as follows:

A **review reservation** is raised if the IRB and the petroleum undertaking cannot reach agreement on the validity of a finding, or on the timescale or action required for close-out of a finding.

Review reservations are included within the Independent Safety Case Review report, which is sent to the CER. The CER process for dealing with review reservations is given in section 4.3.3.2.

An example of the possible workflow is given below with two possible close-out scenarios and a review reservation scenario.

Example

Finding: The gas detection layout was defined before line-of-sight gas detector technology became developed enough to be used reliably. It is not known if the risk of fire and explosion is ALARP as there are no line-of-sight detectors on the Facility.

The petroleum undertaking and IRB agree that the finding should be closed-out (barring any remedial work) within X months of the completion of the Independent Safety Case Review.

- *Close-out Scenario A:* The petroleum undertaking carries out a gas detector layout assessment taking account of all available technologies and the need to meet current Good Practice and for the risk to be ALARP. It shows that the current arrangement is ALARP as additional line-of-sight gas detectors provide little benefit.

- *Close-out Scenario B*: The petroleum undertaking carries a gas detector layout assessment and determines that additional detectors are needed. These are installed X months later and are the subject of a CER inspection.

Review Reservation: The petroleum undertaking and IRB cannot agree on the date for the finding to be closed-out. This is raised as a review reservation in the Independent Safety Case Review Report.

4.3.3.2 CER Process

On receipt of an Independent Safety Case Review report containing a review reservation from a petroleum undertaking, the CER will identify and notify the action required, if any, by the petroleum undertaking to be able to close the review reservation. The CER may undertake inspection in relation to the review reservation.

4.4 Technical Requirements

The petroleum undertaking is responsible for ensuring that the Independent Safety Case Review is thorough. The intention of the review is not to find issues that would be identified by the petroleum undertaking, or the ICB during the course of their normal business, but to review whether the risk as described in the safety case will be ALARP given changes that have occurred over the preceding 5 years and may occur over the next 5 years. Guidance on the CER's expectations for this are given below.

Example

The Independent Safety Case Review is not intended to record individual failures such as the failure of an emergency light, but to identify systemic failures in either the ICB's verification, the petroleum undertaking's assurance activities, or to identify that new, better lighting technology exists and should be considered.

4.4.1 Management Systems Review

4.4.1.1 Operation of the Safety Management System

The SMS must be reviewed to confirm it remains suitable, including a review of actual practices onshore and offshore to:

- Check alignment with the safety case text and referenced supporting documents; and
- Determine whether improvement can be made to the processes.

The SMS review must be thorough and may consider the suitability and application of the:

- Safety policy, i.e. that it is clear how the safety case aligns and implements the policy;
- Safety organisation:
 - The organisation structure, individual accountabilities and responsibilities, need to be reviewed to determine whether each is adequate in terms of safety

management and are an accurate reflection of current arrangements. The review should consider offshore and onshore arrangements, long-term contractors and interfaces;

- Staffing levels, working hours, shift and crew handovers and deputisation arrangements. This includes confirming that staffing (persons on board) is provided at a level that does not require significant extra hours to be worked, that safety critical information is correctly conveyed during handovers and that arrangements for deputising key persons are clear to those involved;
- Communication and workforce involvement in safety, e.g. meetings, toolbox talks, safety awareness initiatives, safety surveys, safety notices etc; and
- Competence management, e.g. reviewing company information to confirm that persons carrying out safety critical work are and have been assessed as competent.
- Planning and implementation:
 - Safe control of operations including that tasks are scheduled and completed by competent persons;
 - Operational/task risk assessments, i.e. review of records and practices for compliance with applicable procedures and guidance;
 - Management of change to ensure the process is robust and correctly implemented (see section 4.4.1.2); and
 - Control and update of documentation, e.g. the currency of the safety case itself, process and instrumentation diagrams following modifications, etc.
- Safety performance monitoring:
 - Review of arrangements to detect weaknesses in the SMS that need to be resolved, e.g. unsafe conditions, safety inspections, equipment failures, asset integrity statistics, deferred maintenance etc. The focus should be on safety performance indicators relating to MAHs and be beyond those required under Safety Performance Reporting in section 3;
 - Analysis of incidents reported since the last review in order to establish that lessons have been learnt, covering:
 - A suitable sample of incident reports to determine whether:
 - The incident's severity classification was appropriate;
 - The immediate cause was identified robustly;
 - Root cause analysis was carried out where required;
 - Actions prescribed as a consequence of the incident are comprehensive, appropriate and completed according to agreed close-out date; and
 - That multiple incidents and underlying trends are being monitored.
 - Confirmation that lessons learnt are effectively communicated to the workforce; and
 - Analysis of audits and reviews of the SMS, including planning of audits, implementation, tracking and closure of actions. The analysis should check the quality and thoroughness of the audits and reviews and that any actions have been fully completed prior to close-out or an adequate explanation for why not recorded. Evidence of a lack of consensus between the auditor and the person responsible for the action should also be looked for and considered.

4.4.1.2 Management of Change

A suitable sample of the changes made to the petroleum infrastructure in the past 5 years must be reviewed to ensure that a robust process for management of change, including design approval and close-out is being implemented.

4.4.1.3 Human Factors

The review must cover human factors issues in order to gauge whether they are being appropriately managed. The IRB should consider the following for review:

- Managing human failures (e.g. through risk assessment and incident investigation);
- Procedures (e.g. review of a sample of procedures to determine how well they support persons carrying out work);
- Training and competence (e.g. determine whether safety responsibilities and tasks align with competence assurance arrangements, review of training provided, including building on the job experience);
- Staffing (e.g. staffing levels, workload, supervision and contractors);
- Organisational change;
- Safety critical communications (e.g. shift handover and permit to work);
- Human factors in design (e.g. control rooms, human computer interaction, alarm management, lighting, thermal comfort, noise and vibration);
- Fatigue and shiftwork;
- Safety culture (e.g. behavioural safety and learning organisations); and
- Maintenance, inspection and testing (e.g. maintenance error).

4.4.2 Operation of the Verification Schemes

The operation of the Facilities Verification Scheme and Well Verification Scheme must be reviewed to identify any improvements in the verification process. The review must consider the suitability of the performance standards and their contents for a suitable sample of SCEs and, for the Verification Scheme(s):

- ICB's verification anomalies that have been raised including their close-out;
- ICB's verification reservations that have been raised;
- Communication between the petroleum undertaking and the ICB(s);
- Audits of the ICB by the petroleum undertaking; and
- Completion of the verification activities, including a review of sampling.

4.4.3 Consideration of Petroleum Infrastructure Ageing

Petroleum infrastructure ageing must be considered (where appropriate) as part of the review, including obsolescence and life extension issues for at least structural integrity, petroleum containment, controls and instrumentation, and other SCEs that may suffer degraded performance due to ageing.

The review must consider whether:

- There are robust structural, pipeline and process integrity management systems in place that account for ageing and possible life extension;
- Suitable fabric maintenance of process equipment and the structures is being carried out;

- Integrity management efforts are not solely being concentrated on current and near future threats, as petroleum infrastructure needs long term plans to address ageing and life extension if it is to operate for an extended period.
- Ageing and life extension are being explicitly addressed in the safety case; and
- Suitable periodic integrity management audits are being performed to aid in the formulation of ageing and life extension protocols.

4.4.4 Review of the ALARP Demonstration

The Independent Safety Case Review must include a review of the ALARP demonstration in the safety case (section 4.4 of the *Safety Case Guidelines*, and the *ALARP Guidance* document). The review must include assessment of whether the following are still current and assessed using current Good Practice:

- Techniques used to identify hazards and determine risks;
- Hazards and risk reduction measures;
- QRA to ensure that the risk from the petroleum infrastructure is accurately represented, including:
 - The data used in the QRA to represent operating conditions of the petroleum infrastructure and that used in calculating the cumulative risk, such as historical failure data;
 - A comparison of the leak data with the petroleum undertaking's experience; and
 - Assumptions are documented and justified.
- Risk reduction measure not deemed reasonably practicable to implement.

4.5 Content of the Independent Safety Case Review Report

The Independent Safety Case Review report, which is submitted to the CER by the petroleum undertaking using the appropriate form,³⁴ must contain the following information:

- The names of everyone involved in the Independent Safety Case Review including those who led it and those who carried it out;
- How the review was carried out;
- The dates during which the review took place;
- Details of workforce involvement, including consultation with the safety representatives; and
- A demonstration that the review process is robust and independent of the petroleum undertaking.

The Independent Safety Case Review report must demonstrate that the petroleum undertaking met the requirements given in section 4.3 and 4.4.

The report should contain the list of:

- Findings, where an action is still under consideration, including the method by which the action will be closed-out; and
- Findings that will be closed-out by completion of any action, and details of the action itself.

³⁴ The appropriate form is provided on the CER website.

All the findings, and all the risk reduction measures considered but found not to be reasonably practicable to implement, or closed-out during the review, do not need to be included. However these should be recorded and retained by the petroleum undertaking as the CER may inspect these at a later date. Any review reservations raised by the Independent Safety Case Reviewer must also be included.

The report must also summarise any revisions made, or intended to be made, to the safety case as a result of the review.

If a material change is made to the safety case as a result of the review, then the safety case must be resubmitted to the CER for approval as per any other material change.

PART 2

AUDIT AND INSPECTION OF PETROLEUM UNDERTAKINGS BY THE CER

5 Audit and Inspection of Petroleum Undertakings by the CER

The CER must establish a system for on-going audit and inspection of designated petroleum activities under the Framework. The purpose of the CER's audits and inspections is to ensure, through acquiring objective evidence, that each petroleum undertaking is complying with the Act, its approved safety case(s) and the conditions of the associated safety permit. As outlined above, the petroleum undertaking is itself required to ensure and demonstrate compliance through verification, safety performance reporting and Independent Safety Case Review. The CER's audit and inspection system operates in parallel with the processes carried out by petroleum undertakings and will, in part, be informed by the outcomes of verification, safety performance reporting and Independent Safety Case Review.

The CER's audit and inspection system assists the CER in meeting its duty to 'monitor and enforce compliance of petroleum undertakings with their obligations' under Part IIA of the Act.³⁵ The outcome of audits and inspections by the CER may form the basis of enforcement action and/or, where necessary and appropriate, criminal prosecution by the CER under the Act.

This section of the *Compliance Assurance System* document sets out how the CER audits and inspects petroleum undertakings with reference to the type of safety permit held, as follows:

- Production Safety Permit (section 5.3);
- Well Work Safety Permit (section 5.4); and
- Decommissioning Safety Permit (section 5.5).

5.1 Audits and Inspections

In general terms, audits are based on examination and/or inspection of records, reports and other evidence produced or generated by a petroleum undertaking relating to, for example, safety operation, safety performance, the Safety Management System, and designs, including verification records, safety performance reports and Independent Safety Case Review reports.

Inspections are physical examinations of petroleum infrastructure, systems and parts of systems and hardware, for the purposes of assessing the integrity, and/or operation of these systems. Inspections will be carried out by petroleum safety officers (PSOs) appointed by the CER for this purpose. Further details are given below on the role and powers of PSOs.

For clarity, the use of either term, namely 'audit' or 'inspection', in this document does not limit the scope or extent of the CER in exercising its powers and functions under the Act.

³⁵ Section 13H(2)(c) of the Act.

The CER will carry out scheduled audits and inspections of petroleum activities and petroleum infrastructure for each safety permit and associated safety case(s). The scheduled audits and inspections will be supplemented by unscheduled audits and inspections where necessary and appropriate. Triggers for these may include, but are not limited to:

- Information received concerning potential non-compliance with a safety permit or safety case;
- Information that verification, or Independent Safety Case Review may not be being carried out with enough independence or competence;
- Reservations raised by an ICB; and
- Information that a safety case may not reflect the true situation with respect to the safety of the petroleum infrastructure.

Audits and inspections will be risk-based, structured around the contents of the safety case and safety permit, and will be carried out throughout the lifecycle of a petroleum activity.

For each safety permit issued (and associated safety case(s)), the CER will maintain an audit and inspection programme for a rolling 5 year period (the 'Audit and Inspection Programme'). The Audit and Inspection Programme will comprise of annually scheduled audits and inspections. The number and extent of the scheduled audits and inspections of an individual petroleum undertaking will be proportionate to the extent of their overall designated petroleum activities.

While a risk-based approach will be applied to audits and inspections, the CER will aim to carry out at least 1 inspection of a piece of petroleum infrastructure associated with each safety permit each year, and aim to have petroleum infrastructure associated with each safety permit inspected by all relevant technical disciplines at least once every 5 years.

For activities regulated under a Well Work Safety Permit or Decommissioning Safety Permit, the duration of the Audit and Inspection Programme will equate to the expected duration of the permit itself. This is expected to be shorter than 5 years, reflecting the shorter term nature of designated petroleum activities under these permits. Scheduled inspections will be carried out during periods when the designated petroleum activity is being planned or carried on.

Individual Audit and Inspection Programmes will be kept under review by the CER and revised as appropriate.

In addition, insofar as possible, the CER will co-ordinate with other statutory bodies on audits and inspections to reduce overlap of regulatory activities and to increase regulatory efficiency.

5.2 **Petroleum Safety Officers**

The CER will appoint Petroleum Safety Officers (PSOs) to assist it in discharging its functions under the Act. The Act confers PSOs with a number of powers,³⁶ including:

- a) At any time, to board, enter, inspect, examine and search any place which he/she has reasonable grounds for believing is used for the purposes of or in connection with a designated petroleum activity and while there, make such inspection, carry out such tests or examinations as may be necessary to ascertain whether the Act is being complied with and for those purposes to take with him/her and use any equipment or materials he/she considers necessary, of any:
 - Petroleum infrastructure;
 - Upstream pipeline;
 - Activity process or procedure;
 - Plant, vessel or equipment; or
 - Records.

A PSO prevented from entering a place in the exercise of his powers may apply to the District Court for a warrant authorising entry.

- b) To carry out an investigation of a petroleum incident when appointed by the CER to do so;
- c) To direct that the place and anything at, in or on it, be left undisturbed for so long as is reasonably necessary for any search, examination, investigation, inspection or inquiry under the Act;³⁷
- d) To take any measurement or photograph or make any electrical or electronic recording which he or she considers necessary for the purposes of any such examination or inquiry;
- e) To take samples of any fluid or gas or other substance found at that place;
- f) As regards any article or substance the PSO finds at that place, to require any relevant person in authority to supply the officer without charge with any such article or substance;
- g) To require any relevant person in authority to produce to him/her such documents, records or materials (and in the case of information in a non-legible form to reproduce it in a legible form) as are in that person's possession or control relating to the matter under inquiry and to give such information as the PSO may reasonably require in regard to such documents, records or materials;
- h) To inspect and take copies of or extracts from any such documents, records or materials or any electronic information system at that place or premises, including in the case of information in a non-legible form, copies or extracts from such information in a permanent legible form or require that such copies be provided;
- i) To remove and retain such records for such period as may be reasonable for further examination;
- j) To require any relevant person in authority to give any information that the PSO may reasonably require for the purposes of any search, examination, investigation, inspection or inquiry under the Act;

³⁶ Section13W(3) of the Act.

³⁷ Section13W(3)(c) of the Act.

- k) To require any person he/she finds at that place to give such assistance and facilities within the person's power or control as are reasonably necessary to enable the PSO to exercise any of his/her powers under the Act; and
- l) To exercise such other powers as may be necessary for the purposes of the exercise by CER of its functions under the Act.

Where a PSO is of the opinion that the condition of any petroleum infrastructure or any part of such infrastructure or an upstream pipeline or any activity, process or procedure carried on, from or in connection with, such infrastructure or pipeline, poses such a substantial and imminent risk to safety that the activity should be ceased until specified measures have been taken to reduce the risk to a level that is ALARP the PSO will immediately inform CER and they may issue an emergency direction to the petroleum undertaking. The emergency direction will state that the activity must be immediately ceased and any measures required to reduce the associated risk to a level that is ALARP.

Where the PSO is of the opinion, following inspection, examination or search, that there is a substantial and imminent risk to safety, the PSO may take any of the following steps:³⁸

- a) Instruct any person to evacuate the premises or place until the PSO is of the opinion that it is safe. This instruction is only in relation to a premises that the PSO has already boarded, inspected, examined or searched to ascertain whether the Act is being complied with;³⁹
- b) Instruct any person to perform or refrain from performing any act, if in the opinion of the PSO, the performance or non-performance of such act is necessary in order to reduce or prevent any danger arising from the carrying on of any petroleum activity;
- c) Search for any escaped oil or gas, or any leak or defect in any part of any petroleum infrastructure, upstream pipeline or plant or equipment;
- d) Interrupt the flow of any oil or gas, or disconnect any part of any petroleum infrastructure, upstream pipeline or plant or equipment;
- e) Liaise with any other authorised person appointed by a body that has functions that are similar or ancillary to the functions of the CER with respect to the safety of petroleum activities.

Where the PSO is of the opinion, following inspection, examination or search, that there is not a substantial and imminent risk to safety relating to a petroleum activity, the PSO will report on its findings to the CER. Based on this report, the CER will form a view as to whether or not enforcement action is required.

It is an offence under the Act to obstruct or impede a PSO in the exercise of powers conferred under the Act, including to fail or refuse to comply with any instruction, requirement or direction of a PSO, to give a PSO false or misleading information, to alter, suppress or destroy any document, record or material that a person has been required to produce or may reasonably expect to produce and to interfere with any action taken by a PSO to interrupt the flow of oil or gas or to disconnect any part of any petroleum infrastructure, upstream pipeline or plant.

³⁸ Section 13W(4) of the Act.

³⁹ Section 13W(a) of the Act.

5.3 *Audit and Inspection in Relation to a Production Safety Permit*

Audits and inspections will be carried out by the CER in relation to a Production Safety Permit, and will include:

- The design process;
- The readiness to operate; and
- Compliance with the Production Safety Case and Production Safety Permit, including:
 - Procedures;
 - Petroleum infrastructure;
 - Competence;
 - Verification;
 - Safety performance indicators
 - Independent Safety Case Review; and
 - General Duty.

5.3.1 *Audit and Inspection of the Design Process*

In order to ensure compliance with the Design Safety Case and the verification process that must be carried out, it is necessary to carry out audits and inspections between the Design Safety Case being submitted and the Production Safety Permit being issued.

The CER will use audit of Facilities Verification as the primary means for confirming compliance with the Design Safety Case. The CER may also carry out direct inspection of the petroleum undertaking's:

- Processes to ensure independence of the ICB from the petroleum undertaking's design activities;⁴⁰ and
- Established management structures, to ensure that they are suitable for reducing the risk to safety from the petroleum infrastructure to ALARP.

The CER's audits will cover the full range of the ICB's activities necessary to identify SCEs, to establish both the suitability of the performance standards and the verification methods for ensuring that they can be met. The audits will be based on a review of a suitable sample of the records of all aspects of verification including:

- The ICB's acceptance of the performance standards with regard to the delivery of risk reduction measures that will reduce the risk to safety to ALARP;
- The methodology for identifying SCEs and defining performance standards;
- The ICB's verification of the suitability of the petroleum undertaking's proposed assurance activities;
- The verification activities that were carried out by the ICB;
- Anomalies arising from the verification process that have not been closed-out;
- The basis for establishing the nature and frequency of verification activities; and
- Any verification reservations raised by the ICB.

⁴⁰ There must be separation between those persons carrying out design activities and those persons carrying out verification of that design; the ICB must not become involved in the design activities.

Depending on the results of the CER's audits of verification, further and/or direct inspection of the petroleum undertaking's design process may be necessary.

Audits and inspections of the petroleum undertaking's processes may include:

- Examination of resources for the design activities;
- Review of basis of design;
- Discussion with key persons carrying out design to confirm their understanding of how the principle of ALARP applies throughout the design process;
- Review of the operation of the management of change procedure dealing with design changes;
- Review of HAZOP implementation and close-out of recommendations; and
- Discussions with design specialists to ensure that they have a clear understanding of the codes and standards they are using, and review evidence of compliance therewith.

5.3.2 Inspection of Readiness to Operate

After submission of a Production Safety Case and before issuing a Production Safety Permit, the CER will directly inspect the petroleum infrastructure and the readiness of the organisation and persons to carry on the petroleum activity(ies).

The scope of this inspection will depend on the type of petroleum infrastructure and whether the Production Safety Case relates to a material change or a new build, but may include whether:

- The petroleum undertaking is capable of implementing the SMS described in its safety case;
- The petroleum undertaking is capable of carrying on the designated petroleum activity or activities concerned in compliance with its duties under section 13K of the Act;
- Construction has been completed according to the design;
- Commissioning has been completed and the plant is ready to start-up;
- Verification activities have been completed (see section 5.3.3.4);
- HAZOP actions have been implemented and closed-out;
- The management of change processes active during construction and commissioning have been signed off by a suitable person;
- Persons carrying out pre-commissioning checks are competent;
- Operational and maintenance procedures are complete and suitable;
- Recruitment, training and deployment of all necessary persons is complete; and
- The management structure has the ability to operate within and meet the requirements of the Production Safety Case.

5.3.3 Inspection of Compliance with the Production Safety Case and Production Safety Permit

5.3.3.1 Audit and Inspection of Procedures

Once an installation is in operation, the CER will inspect to assure continued compliance with the approved safety case. These audits and inspections may cover:

- Implementation and review of the SMS including the permit to work system, risk assessment, isolation procedures and evacuation drills;
- Management of change (with particular reference to safety impact, deviations and technical approval) each with reference to the approved safety case; and
- Whether work is being carried out in accordance with the system, or operational procedures as defined in the safety case.

5.3.3.2 Audit and Inspection of Petroleum Infrastructure

Whilst the continued suitability of the SCEs can be confirmed by audit and inspection of the verification activities, all other aspects of compliance will require confirmation by inspection of the installation and its operation. However, the CER will also directly inspect SCEs and other hardware by a combination of visual inspection and review of records of assurance activities against information in the safety case, maintenance system and verification activities.

For all active SCEs (e.g. pressure safety valves, temperature and pressure regulation systems or emergency shutdown systems) audits and inspections may include the examination of records of maintenance or proof testing (i.e. tests that confirm that the equipment is meeting its functional and reliability requirements), for example:

- Records of the as-found status of SCEs;
- Evidence of proof tests completed within the required timeframe;
- Management action to complete and eliminate overdue work;
- Records of any remedial work;
- Effective management of change through the SMS;
- Apparent inconsistencies or unexpected differences;
- The capturing, analysis and reporting of data from the maintenance and testing activities so that the petroleum undertaking's management understand the state of the petroleum infrastructure; and
- Maintenance of petroleum infrastructure, including competence, timeliness of work scheduling and standards of defect reporting and correction.

5.3.3.3 Audit and Inspection of Competence

In order to assess the competence of persons working on particular operations, it will usually be necessary for a PSO to accompany them whilst they carry out a selected activity, and so observe their technical ability and understanding of the task in hand, their response to outcomes and to witness the recording of results. This should be followed by a review of the historical records to confirm that what has been demonstrated is typical of routine activity and not solely due to the presence of a PSO. The purpose of audits and inspections of competence is to ensure that:

- Persons have appropriate competence for their role and it is regularly reviewed; and
- All aspects of the petroleum infrastructure are understood by those operating it.

5.3.3.4 Audit and Inspection of Verification

The CER will inspect the Verification Scheme to determine whether it complies with the *Compliance Assurance System* and whether it is being implemented as stated. The scope of the audit will depend on the phase of the operation for which the verification is being carried out and the type of petroleum infrastructure to which the verification activities apply.

For the Facilities Verification Scheme and the Well Verification Scheme the audit will be carried out at a combination of the petroleum undertaking's offices, the location of the petroleum infrastructure or the ICB's office, depending on how verification is structured, where the work is carried out and the records kept.

During production the CER will inspect the effectiveness of the petroleum undertaking's verification processes through an examination of records, witnessing of activities and examination of hardware.

The audit of verification during operations may include a review of the records of verification including:

- Reservations in relation to the verification activities raised by the ICB with detailed examination of those that have not been closed-out;
- The verification activities that were carried out by the ICB;
- A review of all outstanding anomalies arising from verification;
- The competence of persons with responsibilities for verification activities;
- The basis for establishing the nature and frequency of verification activities;
- The ICB's verification of the effectiveness of the petroleum undertaking's assurance activities;
- How the verification activities are reviewed and revised; and
- Any other concerns or suggestions for improvement.

Inspection may include direct inspection of the verification processes.

5.3.3.5 Audit and Inspection of Safety Performance Indicators

The CER will check the safety performance indicator data provided by the petroleum undertakings through:

- On-site inspections;
- Examination of systems;
- Direct examination of records and reports; and
- Confidential dialogue with persons such as the safety representatives.

The CER will also use information from previous inspection reports to corroborate the accuracy of the information reported.

5.3.3.6 Audit and Inspection of the Independent Safety Case Review

The CER will check compliance with the requirements for the Independent Safety Case Review (section 4), by a review of records, including:

- Independence and competence of persons who have taken part in the review;
- The process used for the Independent Safety Case Review;

- Evidence that the Independent Safety Case Review revisited the safety critical aspects of codes and standards previously forming the basis of the ALARP demonstration to determine if later revisions are available;
- Evidence that is used to justify the safety critical aspects of codes and standards now in use where the petroleum undertaking judges that it is not reasonably practicable to change to the most recent revision;
- The findings identified by the Independent Safety Case Review to determine whether it was thorough;
- A suitable sample of the risk reduction measures identified that could not be implemented; and
- Any review reservations raised by the IRB.

5.4 *Audit and Inspection in Relation to a Well Work Safety Permit*

The following will be audited and/or inspected by the CER in relation to a Well Work Safety Permit:

- The design process;
- The petroleum infrastructure; and
- Compliance to the Well Work Safety Permit.

5.4.1 *Audit of the Design Process*

The CER's audit activities in relation to the well design process will be examination of the petroleum undertaking's demonstration that verification has been completed.

This audit may trigger a direct inspection, particularly for wells at new locations.

5.4.2 *Inspection of the As-built Petroleum Infrastructure*

The requirements of this section are as per section 5.3.2.

5.4.3 *Inspection of Compliance with the Well Work Safety Case and Well Work Safety Permit*

The requirements of this section are as per section 5.3.3.

Audit and inspection of compliance with a Non-production Safety Case is the same as that for a Production Safety Case, though inspections will occur between the time that a Non-production Safety Case is submitted and the Well Work Activity ends.

5.5 *Audit and Inspection in Relation to a Decommissioning Safety Permit*

The same audits and inspections may be required in relation to a Decommissioning Safety Permit as a Production Safety Permit (section 5.3) apart from the requirement for audit and inspection of an Independent Safety Case Review due to the short term nature of the scope of the Decommissioning Safety Permit.

Through the requirement for a Decommissioning Safety Permit, the CER will be informed of decommissioning activities and will inspect them in the same way as during operations.

5.6 **Enforcement and Prosecution**

The CER's audit and inspection system assists the CER in meeting its duty to 'monitor and enforce compliance of petroleum undertakings with their obligations' under Part IIA of the Act.⁴¹

Audits and inspections may inform the CER of non-compliance, or potential non-compliance, by a petroleum undertaking with the Act. This may result in either or both of the following outcomes:

- Enforcement action by the CER; and/or
- Criminal prosecution by the CER under the Act.

Where the CER forms the view that a petroleum undertaking has failed to comply or is not complying with the Act, the CER may take enforcement action by issuing to the petroleum undertaking concerned any (or a combination) of the following:

- Written direction to submit an improvement plan;
- Improvement notice;⁴²
- Prohibition notice;⁴³
- Notice requiring a safety case review;⁴⁴
- Notice that the CER intends to revoke the undertaking's safety permit;⁴⁵ or
- Emergency direction.

The CER may also apply to the High Court for an order to restrict or prohibit petroleum activities where the CER has concerns as to the safety of the activity.

The CER's enforcement powers are progressive in nature and designed to encourage compliance. In the event of non-compliance by a petroleum undertaking with the CER's enforcement steps or more generally, non-compliance with the Act or safety permits, the CER is empowered under the Act to bring criminal prosecutions.

The Act sets out 5 categories of offences which may lead to criminal prosecution as follows:

- Carrying on a designated petroleum activity without a safety permit;⁴⁶
- Obstructing, misleading, failing to comply with, or, interfering with the functions of a PSO;⁴⁷
- Failing to notify the CER of a petroleum incident and failing to provide a full report;⁴⁸
- Failing to comply with an improvement notice;⁴⁹
- Failing to comply with a prohibition notice.⁵⁰

⁴¹ Section 13H(2)(c) of the Act.

⁴² Section 15 of the Act.

⁴³ Section 16 of the Act.

⁴⁴ Section 11 of the Act.

⁴⁵ Section 13T(2) of the Act. See also section 12.3.

⁴⁶ Section 13E (3) of the Act.

⁴⁷ Section 13W(11) of the Act.

⁴⁸ Section 13S(3) of the Act.

⁴⁹ Section 13Z(10) of the Act.

⁵⁰ Section 13AA(9) of the Act.

The potential penalties on conviction of an offence under the Act are as follows:

- On summary conviction a fine not exceeding €5,000 or a term of imprisonment not exceeding 6 months or to both; or
- On conviction on indictment to a fine not exceeding €3,000,000 or a term of imprisonment not exceeding 3 years or to both.⁵¹

Under the Act, individuals may be prosecuted as well as a petroleum undertaking. Section 5 of the Act provides that where an offence has been committed by a corporate body and is proven to have been committed with the consent or connivance of or to be attributable to any neglect on the part of the person being a director, manager, secretary or other officer of the corporate body, or a person who was purporting to act in any such capacity, that person, as well as the corporate body shall be guilty of an offence and be liable to be proceeded against and punished as if he or she were guilty of the first-mentioned offence.

⁵¹ Section 13W(11) of the Act.

Appendix A. Example Operational Performance Standard and Facilities Verification Scheme

Note that in the example below some numerical criteria have been replaced by XXX.

SCE: 001 FIREWATER PUMPS							
GOAL To provide firewater for fire protection systems.							
Extent of System				Interfaces			
<ul style="list-style-type: none"> • Firewater pumps • Firewater Pump Enclosures • Diesel Day Tanks 				<ul style="list-style-type: none"> • Fire and Gas System • Emergency Shutdown System • Firewater Ringmain • Firewater System • Foam Systems 			
FUNCTIONALITY							
ID	Performance Criteria	Basis for Performance Criteria	Assurance of Performance Criteria	Verification			
				Activity	Phase	Sample Size	Frequency
F1	Three x 100% capacity firewater pumps each fed from a dedicated diesel tank Each fire pump to deliver a minimum acceptance flow of xxxxm ³ /hour at xxx barg	Basis of Design for firewater (including ALARP Demonstration) Hydraulic analysis report for firewater system NFPA 20 Centrifugal Fire Pumps Fire Protection Philosophy.	Design and testing during commissioning Subsequent modifications to the firewater hydraulic analysis or firewater pumps and ancillary equipment will be subject to the Change Control Procedures.	<u>F1.1</u> Review design and modification records to confirm initial suitability and management of change procedure has been followed, including update of assurance and verification activities associated with modifications.	Design	100%	Initial suitability and on modification
			Planned maintenance activities for the firewater pumps are scheduled in MMS and are carried out in accordance with: PMRs FP1234-8	<u>F1.2</u> Witness performance test of fire water pumps.	Operational	1 Firewater pump	12 m
				<u>F1.3</u> Review firewater pump safety critical maintenance for previous 12 months	Operational	100%	12 m

F2	<p>Firewater pumps to be capable of being started by all of the following means:</p> <p>All firepumps:</p> <ul style="list-style-type: none"> • have two independent means • manually from the local control panel. <p>Duty firewater pump</p> <ul style="list-style-type: none"> • Automatically via the DCS in accordance with cause and effects. • If firewater ringmain pressure falls below xxx barg. <p>Standby firewater pump</p> <ul style="list-style-type: none"> • Automatically on failure to start the duty firewater pump. 	NFPA 20 Centrifugal Fire Pumps	Left blank in example				
F3	Each firewater pump to be provided with at least xx hours diesel fuel capacity at full load	Basis of Design for firewater (including ALARP Demonstration) Fire Protection Philosophy.	Left blank in example				
F4	Firepump status to be monitored and indicated/annunciated in CCR	NFPA 20 Centrifugal Fire Pumps Control Philosophy	Left blank in example				
F5	All firewater pumps to be configured to be allowed to run to destruction	Basis of Design for firewater (including ALARP Demonstration)	Left blank in example				

AVAILABILITY							
ID	Performance Criteria	References	Assurance	Verification			
				Activity	Phase	Sample Size	Frequency
A1	At least 2 Firewater pump to be available at all times	n/a	PMRs as F1 to F7 above Operational risk assessments for any reduced availability of firewater pumps	A1.1 Review Operational Risk Assessments to determine whether unavailability of any firewater pump is managed	Operational	100%	12 m
RELIABILITY							
ID	Performance Criteria	References	Assurance	Verification			
				Activity	Phase	Sample Size	Frequency
A1		Firewater system reliability study	Review maintenance records to determine reliability of the firewater pumps PMRs 1,2,3,4,5,6	A1.1 Review of the firewater pumps reliability assessment to determine if undertaken correctly.	Operational	100%	12 m
SURVIVABILITY							
ID	Performance Criteria	References	Assurance	Verification			
				Activity	Phase	Sample Size	Frequency
S1	Location of firewater pumps to minimise the potential for damage due to impacts, dropped objects, explosion and environmental conditions.	Passive Fire Protection Layout Drawings. Fire and Explosion Risk Analysis Dropped Objects Study -	Assurance by design and Management of Change.	S1.1 Review design documents to ensure each firewater pump and day tank are protected from dropped objects, explosion overpressures and environmental conditions by location.	Design	100%	Initial suitability and on modification