

HID Inspection Guide Offshore

Inspection of Safety Critical Element Management and Verification

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Summary

This Inspection Guide (IG) describes current key topic areas on SCE management and Verification that inspectors will consider when they inspect offshore installations and duty holders. The document sets out the success criteria to assess and rate duty holder performance. Information on regulations, technical standards and other sources of guidance is also provided.

Introduction

The aim of this IG is to provide information and guidance to offshore inspectors to support the delivery of consistent and effective safety critical element (SCE) management and assurance. It does this by highlighting current key areas to be covered during inspections, providing a framework for inspectors to judge compliance, assign performance ratings, and decide what enforcement action to take

should they find legislative breaches. In doing so, it complements HSE's [Enforcement Policy Statement](#) (EPS) and [Enforcement Management Model](#) (EMM).

Historically, major accidents offshore have resulted from multiple failures in major-hazard risk control measures. In the UK these risk control measures have been defined in the Safety Case Regulations, as SCEs and include hardware as well as safety critical computer software. To meet HSE's goal of avoiding catastrophe these SCEs must be correctly identified, adequate in performance and dependable when required.

Critical to the control of major hazards is the correct identification of the major hazard risk control measures (SCEs) and the performance required of them. In addition, a management system must be put in place to ensure that the SCEs are effective and dependable at all times and their operational status known.

The safety case regulations require duty holders of offshore installation to appoint Independent and Competent Persons (ICP) to verify the suitability of these major hazard risk control measures. The process whereby ICPs ascertain the suitability of SCEs is known as "verification" within the UK offshore industry.

This IG provides information and guidance to ED Offshore inspectors on what constitutes 'SCE Management' and 'Verification' to aid the delivery of consistent and effective inspection of such arrangements.

The assessment and inspection of **SCE management** involves examining a broad range of management elements. These include policy, organisation (including roles and responsibilities), hazard identification, risk analysis, risk control measures, monitoring and review. Risk control is achieved through the maintenance and inspection of SCEs to ensure their correct operation, management of change and the management of occasions when the SCEs are impaired.

The assessment and inspection of the **Verification** arrangements involves ensuring that the activities undertaken by the Independent Competent Persons to verify the SCEs and Verification management arrangements are fit for purpose

This IG can also be used by offshore operators to prepare for inspections and to better understand the intervention plans drawn up for their operations by HSE. In addition, it can be used as a tool to help operators assess their own performance, for example, in carrying out gap analyses against the success criteria. This will enable operators to proactively identify and take steps to rectify any potential weaknesses in their arrangements for SCE Management and Verification.

The SCE management section of this IG may also be used to assist safety case assessment in this area.

The following are the key areas covered within this IG.

1. SCE management policy

2. SCE and Verification leadership commitment
3. SCE management process
4. Management of changes to SCEs
5. SCE maintenance
6. Competent advice on SCEs (provision of Technical Authorities, TA)
7. SCE performance review
8. Verification arrangements
9. Duty holder's Verification planning
10. Verification effectiveness
11. Performance standards
12. Competence and independence of the ICP
13. Revision of the Verification scheme
14. Multiple ICPs
15. Re-tendering of ICP contracts and change of duty holders

Action

There are a number of different models used for delivering SCE management. They all must have the following, well known, elements in place:

- Policy to define what is required – the objectives;
- Organisation / planning – ensure resources, role and responsibilities etc are in place to enable the above objectives to be met;
- Implementation – how the above is delivered contained in procedures / processes;
- Do – the carrying out of the processes / procedures defined above
- Monitoring / Review – have the processes / procedures implemented the objectives in the policy i.e. have you done what you said you would do and are the results what you want?

Research has indicated (RR756) that it is not necessarily the way an operation is organised that achieves success, but rather the 'rigour' that the organisation exhibits in implementing its chosen way of operating. For example, not whether they have in house or contracted out TAs but rather can they obtain good competent advice and do they use it well?

This guide attempts to outline in Appendix 2, what is required from an organisation rather than how to organise the management of major accident hazards i.e. are the outputs of organisation suitable and sufficient and pursued in a 'rigorous' manner?

The problem comes in defining 'rigour' and whether the 'rigour' expressed by an organisation (operator) is suitable and sufficient to manage major hazards. Research report RR756 tries to overcome this by giving a table of aspects of rigour (reproduced in Appendix 3).

It is suggested that the approach adopted in assessing the topics given below is that the 'rigour' in each of the key elements above (plan-do-monitor) is assessed.

In an attempt to help with what is "suitable and sufficient" for the key topic areas listed above, benchmarks or norms have been defined. It is expected that an

operator will meet these benchmarks. A number of these benchmarks refer to, or draw upon, information from other Inspection Guides.

Many of these topics, if not all, can be undertaken via office visits. However, it is likely that covering all the topics would take a day or two. It is envisaged that undertaking examinations in these inspection topic areas over a 2 to 3 year rolling programme would ensure that the inspection expectations given in SPC/ENF/183 would be met. In addition, the SCE management topics may assist in safety case assessment in this area.

Critical success criteria are listed under the inspection topics (see appendices); these cover the key issues that inspectors should consider when carrying-out inspections against each core intervention issue. In some instances, not all of the success criteria will apply, so inspectors should make a judgement regarding which of these are relevant in each case. If the relevant success criteria cannot be met, inspectors should assess how serious the consequences of failure to comply could be. This will inform their decision making in terms of the [performance ratings](#) that they assign and the enforcement action they take (if any) based on the findings of the inspection.

When carrying out inspections covered by this guidance inspectors should:

- check the key issues against their success criteria in Appendices 2 to 16;
- use the generic performance descriptors in Appendix 9 to:
 - determine the appropriate performance rating; and
 - the initial enforcement expectation to use alongside the EMM.
- consider how and when the issues raised during an inspection are to be closed out and recorded using the COIN issues tab;
- assess the extent to which senior management leadership influences front-line safety; and
- where occupational health, safety and welfare concerns are encountered during an inspection, deal with such issues as a matter of routine and apply existing standards to determine what action to take in each case according to HSE's EPS and EMM.

Inspectors should use the HID generic performance descriptors to determine the appropriate performance rating for each of the four core intervention issues covered by this IG. The appendices also give guidance on the initial enforcement expectation and should be used alongside the [Enforcement Management Model](#) (EMM). The local factors that apply in each case will ultimately determine the whether there should be any enforcement action. Consideration also needs to be given as to how and when the issues raised during an inspection should be closed out. Inspectors must adhere to the relevant operational guidance (e.g. on use of the COIN issues tab).

Background

Relevant Legislation

- The management of SCEs and their verification is driven by the following regulations:-
- [The Offshore Installations \(Safety Case\) Regulations 2005](#)
- [The Offshore Installations \(Prevention of Fire and Explosion, and Emergency Response\) Regulations 1995 \(PFEER\)](#)
- [The Offshore Installations and Wells \(Design and Construction, etc.\) Regulations 1996 \(DCR\)](#)
- [The Management of Health and Safety at Work Regulations 1999, \(MHSWR\)](#)
- [The Provision and Use of Work Equipment Regulations 1998 \(PUWER\)](#)

Organisation

Targeting

Inspections should be carried-out in accordance with ED duty holder intervention plans.

Timing

Inspectors should undertake SCE verification inspections as part of the agreed ED Offshore Intervention Plan; when intelligence indicates intervention is necessary, or as part of an investigation following an incident.

Resources

Resource for the undertaking of SCE verification interventions will be agreed as part of the ED Offshore Work Plan or by agreement between discipline specialist team-leaders and inspection management team-leaders, as appropriate.

Recording & Reporting

The duty holder performance ratings should be entered on the Inspection Rating Form (IRF) tab of the relevant installation Intervention Plan Service Order. Findings should be recorded in the normal post inspection report and letter.

Further References

See Appendix 1

Contacts

ED Offshore: ED 4.2 specialist inspectors

Appendices

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Appendix 1: Additional Guidance

Inspectors should be familiar with the guidance below prior to carrying out the inspection.

HSE Guidance

- [Guidance SCR05, L30](#)
- [Guidance on PFEER \(L65\)](#)
- [Guidance on DCR L85](#)
- [Guidance on MHSWR, L21](#)
- [Guidance on PUWER, L22](#)
- [Successful health and safety management \(HSG 65\)](#)
- [Developing process safety performance indicators: a Step-by-step guide for chemical and major hazard industries \(HSG254\)](#)
- [Leadership for the major hazard industries \(HSE INDG 277\)](#)
- [Leading health and safety at work: Leadership actions for directors and board members](#)
- [Effective implementation of offshore verification requirements, HSE information sheet 01/2012](#)
- [Specialised Industries: major hazard leadership delivery guide](#)
- [Specialised Industries: Assessing risk control systems: RCS 00 - Generic Risk Control System Inspection Guidance](#)
- [Specialised Industries: Assessing risk control systems: RCS 01 - Examination and Testing of Safety Critical Plant](#)
- [Specialised Industries: Assessing risk control systems: RCS 04 - Planned maintenance procedures](#)
- [RCS 5 - management of plant and process change](#)
- [RCS 13 – Hazard Identification and Risk Assessment \(HIRA\)](#)

- [COMAH Competent Authority, Inspection of Competency Management Systems at COMAH Establishments \(Operational Delivery Guide\)](#)

Industry Guidance

- Guidelines for the Management of Safety Critical Elements (2006); UKOOA.
- UK Oil & Gas Guidance on the Conduct and Management of Operational Risk Assessment, Issue 1, January 2012.
- [Assurance & Verification Senior Management Summary \(tier 1\), Step Change in Safety](#)
- [Assurance & Verification Summary Guidance \(tier 2\), Step Change in Safety](#)
- [Assurance & Verification Practitioners' Guidance \(tier 3\), Step change in Safety](#)
- [PSLG Principles of Process Safety Leadership](#)
- [Effective implementation of offshore verification requirements, Offshore Information Sheet No. 1/2012](#)
- High Level Framework for Process Safety Management, Energy Institute (January 2010).

Appendix 2: SCE management: policy

Objective

To ensure that the health and safety policy explicitly addresses major hazards and to take action if this is missing.

Rationale

It is inconceivable that a major-accident hazard installation fails in its health and safety policy statement to provide guidance upon major hazards.

Such a policy should cover major hazard risk control measures (SCEs) by giving policy on such matters as SCE management, their maintenance, management of their change and management of their impairment.

Benchmark

- MHSWR, regulation 5 and guidance relating to planning and organising for safety.
- HSG 65 describes how effective health and safety policies set a clear direction for the organisation to follow. They contribute to all aspects of business performance as part of a demonstrable commitment to continuous improvement.

Critical success criteria

The policy must demonstrate management commitment to major hazard safety and their intention to include it as an integral part of productivity, competitiveness and profitability. Thus, there should be recognition of the potential of their operations to cause major accidents and a clear focus on major hazard control within the policy. The policy should contain:

- A commitment to specifically identify and control all major accident hazards;
- A commitment to provide sufficient resources to identify & control major hazards;
- A commitment to set and monitor major hazard performance indicators and;
- A commitment to leading by (positive) example (e.g. regular site tours by management and taking action where problems are found).

Appendix 3: SCE and verification leadership commitment

Objective

To examine the extent that the senior managers (onshore and offshore) are aware of the performance of SCEs, and the extent they have demonstrated their commitment to ensuring that such assets remain fit for service at all times and form an opinion on the adequacy of this.

Rationale:

It is important that the senior leadership teams (both onshore and offshore) have clear visibility of the performance of the various systems that prevent, detect, mitigate, control or substantially contribute to major hazards in order that they have confidence that the installation remains in a fit state to operate safely.

In addition, it is important that those in ultimate authority demonstrate a commitment to asset integrity by providing authority and budget to those who are charged with making key decisions regarding fitness for service and supporting any decisions they make. This commitment is of particular value when expressed by onshore management as they normally control the resources required to ensure the effectiveness of SCEs.

Benchmark

- HSE and industry have produced guides on leadership in this area ([HSE indg 277](#) and [Senior Management Summary \(tier 1\)](#)).

Critical success criteria

- There should be a clear set of Key Performance Indicators (KPIs) for the performance of SCEs. These should be reviewed on a regular basis, with evidence that poor performance is subject to challenge.
- Where difficult integrity decisions have been necessary, there should be evidence that the leadership teams have supported the independence of those charged with making such decisions.
- Further, in depth criteria are given in the [Leadership assessment proforma](#) and are based upon the 8 principles of process safety leadership developed by the Process Safety Leadership Group (PSLG).
- For verification, [HSE Offshore information sheet No. 1/2012](#), gives additional criteria for senior management using the ICP findings as key performance indicators (KPIs).
- Having regular verification status meetings with the ICPs to ensure remedial action closeout dates are set, monitoring their resolution, and establishing an escalation procedure to reinforce accountability; including annual reports on the suitability of SCEs from the ICP and TAs.
- Establish a clear escalation route to senior management when ICP findings cannot be resolved.

- Encouraging the workforce to understand the part SCEs play in major accident hazard control, and ensuring they have the capability and the necessary empowerment to take action.
- Establishing a process for systematic root cause investigation of significant SCE performance failures identified during ICP verification work.
- Using the ICP findings to support the case for safe operations.

Appendix 4: SCE management process

Objective

To ascertain that the duty holder's SCE management process within their safety management system is fit for purpose and form an opinion on the suitability and effectiveness of this process with respect to managing major hazards.

Rationale

Successful management of major hazards requires that initiating events, as well as the barriers (i.e. SCEs), are correctly identified. Furthermore, the required performance of SCEs must be ascertained and assessed to ensure the risks are ALARP. This requires a robust system to ensure that the necessary actions are identified, assigned, undertaken and monitored to ensure that the performance required is delivered.

Benchmark

- MHSWR (1999) regulation 5 – planning and associated guidance and ACOP.
- Roles & responsibilities, etc., are as described in HSG 65.
- Hazard identification – [RCS 13](#).
- Identifying SCEs - Step change Tier 3.
- Performance standards - Step change Tier 3.
- Monitoring and review – HSG 65.

Critical success criteria

A clear, well defined process should exist containing:

- A definition of roles and responsibilities onshore and offshore for managing SCEs;
- Methodology for identifying SCEs, changes and deviations to them;
- The ability to assess the performance required from SCEs and then specifying these in performance standards;
- A maintenance system identifying the components of SCEs, maintenance and tests required on them. These requirements should assure that the performance standards are met. The system must be capable of recording and reporting on those tests and maintenance activities;
- A capability to monitor SCE performance through suitable reports / KPIs (e.g. SCE backlog, SCE deferrals, SCE corrective work orders, SCE impairment risk assessments, etc) and report to appropriate management levels offshore and onshore;
- Provision for consistently applying a management of change procedure that assesses the impact of changes on SCEs and includes involving the ICP where SCEs are impacted; and
- For impaired SCEs (i.e. SCEs found not to meet their performance standards or defective), a procedure for determining whether safe operation is still possible

must exist. Where Operational Risk Assessments (ORA) are used, they must be **biased** to finding and implementing additional risk control measures.

Appendix 5: Management of changes to SCEs

Objective

To check that after a change to an SCE the duty holder has ensured that it is still suitable and, in addition, the ICP has had the opportunity to verify its suitability.

Rationale

The duty holder has a duty (under PUWER and DCR) when making changes to or repairs on SCEs that they remain suitable and effective and the changes do not affect safety. Whilst making changes the effectiveness of the SCEs involved may be affected. This will require a review / revision of the risk assessments to ensure safe operation is possible. Where the effectiveness of SCEs is compromised during the change additional risk control measures must be implemented.

It is expected that the TAs will be involved in all changes to SCEs to ensure suitability is maintained to the appropriate standards. Depending upon the extent of the change a full design review process may be required.

Major repairs to SCEs are expected to be verified by the ICP. The verification activities must be defined before the change is made to ensure the ICP has the opportunity to comment on specification, materials etc., as indicated in the guidance to SCR05 (paragraph 97). The regulations allow for either the ICP or the duty holder to define the activities. However, the ICP must comment on the activities and raise reservations if they consider them inappropriate.

Benchmark

- Duties imposed by the PUWER and DCR regulations to ensure SCEs remain effective. These duties include the requirement to maintain the equipment, ensure its integrity, undertake testing of safety functions, and to keep records of maintenance and testing.
- SCR05 regulation 20 requires the ICP to re-assess suitability after major repairs or modifications.
- RCS 5 -management of plant and process change.
- Step Change in safety, Assurance and verification: practitioner's guide (Tier 3) page 64.
- UK Oil & Gas Guidance on the Conduct and Management of Operational Risk Assessment, Issue 1, January 2012.

Critical success criteria

- A procedure for management of change (MOC) must exist.
- The procedure must address the impact of changes and major repairs on SCEs.

- Any changes or major repairs to SCEs must be reviewed by a TA.
- Suitable risk assessments must be carried out to identify and implement additional risk control measures to ensure safe operation of SCEs undergoing repair or modification.
- Once the MOC procedure has identified a change to the effectiveness of a SCE or a major repair on it the ICP must be involved to ensure verification activities are drawn up to verify its suitability before being put back into service.
- The ICP activities should be defined before the major repair or modification is undertaken.
- The ICP should comment on the additional verification activities prior to the change / major repair being undertaken.

Appendix 6: SCE maintenance

Objective

To check that the maintenance system is capable of ascertaining if the SCEs meet their required level of performance and **availability**.

Rationale

The duty holder has specific duties under PUWER (for plant) and DCR (for structures) to maintain SCEs. These duties require a mixture of inspection and testing routines (commonly called assurance maintenance routines) to demonstrate that the SCE meets its performance standard. Other maintenance routines may exist to ensure the SCE will continue in a state of good repair.

For a number of SCEs a key parameter will be their availability – the likelihood of operating when required. These availability criteria may be derived from the QRA or from SIL assessments. The availability requirement is then used along with reliability data to set the test intervals for the SCE (e.g. how often is the SCE performance tested). These tests are carried out at the prescribed intervals to ensure hidden faults are found and to monitor the ability of the SCE to meet its availability target.

Benchmark

- Duties under PUWER and DCR.
- RCS 4 – Planned Maintenance Procedures.
- Step change in safety, Assurance and verification: practitioner's guide (Tier 3).
Step Change.

Critical success criteria

A maintenance process must exist giving:

- Policy: Senior management should lay down a clear policy and objectives for planned maintenance procedures to ensure the installation is operated safely and maintenance tasks are prioritised and undertaken.
- Organization: SCE systems and components must be identified within the maintenance system and kept up to date.
- Organization: The overall objective is to maintain the plant using experienced and competent staff provided with clear and useful maintenance procedures. Maintenance should be properly planned and resourced to fit in with production.
- Organization: SCE maintenance identified and given the highest priority. SCE maintenance may be divided into assurance routines (inspect, test) in which functionality is proved and maintenance routines used to ensure good repair is maintained.
- Organisation: Recognise that SCEs can be impaired or their maintenance routines deferred and provide robust procedures to control risks arising from impairment or deferral.

- Implement: Maintenance tasks must be carried out by competent persons and the results recorded.
- Implement: Initiate and carry out corrective measures where defective performance in SCEs are found (i.e. ORA initiated and additional control measure implemented).
- Implement: Deferral procedure should check that there is an operational capability of undertaking the task (i.e. suitable personnel and sufficient resources).
- Implement: A methodology to take account of concurrent ORAs on differing SCEs (cumulative risk).
- Monitor / review: Assessments of SCE impairment and / deferrals must be reviewed by TAs and once reviewed the results are collectively interpreted and reported as an input to the periodical Senior Management Review. This process must be documented.
- Monitor: SCE deferrals, maintenance and correctives undertaken so that backlogs, if any, can be controlled.
- Monitor: SCE availability and their performance. This requires that suitable data i.e. fail / pass criteria exist, the results recorded in the maintenance system and the information can be extracted simply. Storing the test results in a text field makes the analysis of availability very time consuming and unlikely to be undertaken.

Appendix 7: Competent advice on SCEs (provision of TAs)

Objective

To form an opinion that competent technical advice on the integrity of SCEs is available to the operator and the ICP remains independent and undertakes checks on that advice.

Rational

A number of cases have been found where a "small" operator has insufficient competent expertise within their organisation to provide advice on safety matters so forcing an over reliance on, for example, class societies.

Benchmark

- MHSWR regulation 7 - every employer shall appoint one or more competent persons to assist him in undertaking the measures he needs to take to comply with the requirements and prohibitions imposed upon him by or under the relevant statutory provisions.
- Inspectors during their examination of SCEs should inspect the duty holder's source of competent advice (e.g. TAs) and satisfy themselves that they have sufficient expertise to assess the suitability of SCEs. It should be remembered that the verification activities (where suitability is assessed) are independent and are, in addition to the duty holder's own assurance activities (SCR05, regulation 2(5) and 2(7)).
- Where deficiencies are found a comprehensive assessment tool for competency can be found at [COMAH Delivery Guide Competence Management Systems](#) and this can be adopted for use in the offshore industry.

Critical success criteria

- Offshore and onshore personnel must have access to competent advice with respect to SCE performance. TAs should be in the position to provide this advice.
- The person providing the advice shall be directly responsible to the duty holder and must be independent of the ICP.
- TAs or the person giving the competent advice must have first hand knowledge of the plant they are responsible for (i.e. visit the installation).
- The competence, training, experience required to be a TA must be defined by the duty holder but should address:-
 - Their competence is relevant to the SCEs;
 - They are aware of the key regulatory requirements in SCR05, DCR, PFEER etc.
 - Continuing competence is being assured.

- Have a thorough understanding of major accident hazards specific to that facility; safety critical elements; and SCE verification and performance standards;
- Are aware and have an understanding of key information documented in the installation Safety Case; main plant isolatable inventories; incident escalation pathways; and prevention, control and mitigation barriers;
- Have an awareness of process safety and integrity management principles, engineering standards and specifications ;
- Have relevant plant knowledge, understanding of operational status / plant conditions and suitable experience;
- Are able to apply their ORA process and methodology;
- Can understand SCE impairment rule sets;
- Have an understanding of specific site emergency response plans and procedures and
- Are aware of the suitability and limitations of ORA process.

Appendix 8: SCE performance review

Objective

To ascertain that the duty holder has a suitable system for assessing the effectiveness of their processes that deliver adequate SCE performance.

Rationale

The main reason for measuring process safety performance is to provide ongoing assurance that risks are being adequately controlled. A valid case for safe operation requires the operational status of SCEs to be known at all times in order to take appropriate remedial action e.g. imposition of additional risk control measures. Such a system must be reviewed to ensure its effectiveness.

Directors and senior managers should monitor the effectiveness of internal controls against business risks. For major hazard installations process safety risks will be a significant aspect of business risk, asset integrity and reputation.

Effective management of major hazards requires a proactive approach to risk management, so information to confirm critical systems are operating as intended is essential.

To maintain the case for safe operation SCEs must be capable of functioning as required. Where defects are known additional risk control measures must be implemented. KPIs should exist to monitor the SCE status.

The effectiveness of systems that deliver this must be reviewed and audited to ensure their effectiveness is maintained. In addition, failures in the system that ensure that SCEs meet their performance criteria must be investigated to identify and implement corrective actions to ensure adequate future performance. A compliance audit will only give limited information on the effectiveness of a process.

Benchmark

- SCR05, regulation 12.
- HSE guidance “Developing process safety indicators”.
- Step Change in Safety: Assurance and verification a practitioner’s guide, page 39.

Critical success criteria

- KPIs associated with SCE performance are reported to duty holder’s senior management onshore.
- The duty holder has a process for the collection of incident and near miss data and analyses this for possible SCE maintenance failures e.g. using a root cause analysis system.
- The duty holder undertakes trend analysis for maintenance failures on SCEs including both physical and process failures.

- KPIs are used by the duty holder to measure completion of inspection and assurance routines for SCEs as well as other SCE maintenance and corrective (repair) actions.
- The duty holder has a system for checking the adequacy of maintenance work, e.g. spot checks. Frequency/depth should be based on safety criticality of plant items.
- A process exists to review the effectiveness of the SCEs against the barrier model. Such a review could include, for example:
 - expectations for performance review are documented;
 - assessment of ICP findings both current and historic;
 - maintenance Management Systems (MMS); Correctives, ORA's & deferrals;
 - TA periodical report;
 - ICP periodical report should be holistic and consider preceding years; and
 - a review of the MOC as applied to SCEs and performance of the MOC system.
- The duty holder provides an Independent audit of the SCE management system.
- The duty holder monitors the verification scheme to ensure:
 - Resources are available for the timely and satisfactory completion of verification activities and;
 - The timely closure of actions and comments arising from the ICP's examinations including implementing additional risk control measures where the ICP finds that the SCE does not meet its performance criteria and;
 - Reviews of the scheme take place at regular intervals and after relevant events and they include all key stakeholders and members of the leadership teams of both organisations.
- The duty holder must conduct independent audits of SCE management and of the verification scheme. These audits must consider the competences of both the duty holder's team and the ICP team as well as management arrangements. It is unlikely that the ICP undertaking an audit of the verification scheme is sufficiently independent to meet the requirement of the SCR05.

Appendix 9: Verification arrangements

Objective

To check that arrangements conform to the legislative requirements.

Rationale

The regulations require a written scheme of verification covering SCEs and specified plant to be effective for each installation. Such a scheme is drawn up in consultation with an independent and competent person (ICP). The ICP undertaking the activities is required to comment and raise any reservations with scheme if they believe that parts of the scheme (including activities) are not appropriate or adequate.

A proactive scheme will begin at the design stage for a fixed installation; and when entering UK waters for MODUs / Flotels, so that the ICP can judge the suitability and effectiveness of SCEs before they are put into service for the first time or after modification or major repair. Once in service the ICP is expected to comment upon their continuing suitability.

Benchmarks

- OSCR regulations 2, 19-21 and schedule 7.
- Step Change in Safety: Assurance and verification a practitioner's guide.

Critical success criteria

A written scheme of verification exists containing:

- Principles for selection of persons to perform functions under the scheme (e.g. independence, competence etc);
- Principles to be applied to keep the scheme under review;
- Arrangements for communication of information (increased importance when more than 1 ICP organisation is used);
- The nature and frequency of testing;
- Arrangement for review and revision of the scheme;
- The arrangements for the making and preservation of records;
- Communication of ICP findings to an appropriate level of management where they can be resolved;
- Proactive verification of safety critical temporary equipment; and
- Comments upon the scheme by the ICP.

Appendix 10: Duty Holder's Verification planning

Objective

To check that the verification activities are likely to be undertaken in a timely manner.

Rationale

Inspections have found, on a number of occasions that the period of ICP examination had stretched (i.e. occurred at a lower frequency than required by the scheme). This was due to a failure to co-ordinate the ICP visits offshore with the availability of plant and personnel to perform the assurance activities that the ICP was required to witness. This resulted in not all the activities being witnessed in within the required period i.e. at the required frequency. Installations where the ICP and installation activities were integrated usually achieved the required frequency of ICP activities.

Benchmark

- Step Change in Safety: Assurance and verification a practitioner's guide.
- HSE information sheet 01/2012

Critical success criteria

- Verification activities are integrated within duty holder's planning system.
- There should be a Plan for an ICP review of duty holder's assurance strategy and processes. This is an integral part of ICP activities.
- The plan defines sample size and rationale for its change and ensures that a different sample is chosen each time over a defined time period.
- The plan is monitored to ensure missed activities are completed within the appropriate time frame and lessons learnt are incorporated.
- Project verification activities are defined at an early stage (before significant work commences), written down, and the ICP fully engaged to ensure their comments are raised early enough in the project life cycle to be acted upon. (This is a requirement for an effective scheme.)
- Project plans contain verification milestones.
- The duty holder should own the verification scheme.
- The ICP should be kept informed of all relevant changes including, major repairs and future use of safety critical temporary equipment .
- The duty holder ensures that both performance standards, and changes to them, are reviewed by the ICP as part of initial and continuing suitability.

Appendix 11: Verification effectiveness

Objective

To check that the duty holder has an effective verification scheme.

Rationale

Legislation requires the duty holder to maintain an effective verification scheme to provide an external opinion on the suitability of their SCEs.

Benchmark

- SCR05 regulation 21.

Critical success criteria

- Verification activities are completed within the time period set by the scheme.
- ICP recommendations are acted upon and closed out in a timely manner where:
 - Level 1 findings (comments) are closed out before, for example, 6 months.
 - Level 2 findings (single performance standard failure with no immediate threat) are closed within, for example, 1 month.
 - Level 3 findings (fundamental SCE failure) are raised to senior management and a case for safe operation made before operations continue.
(Some overdue findings may be acceptable as long as they are being pursued to closure in a rigorous and urgent manner.)
- ICP recommendations are closed-out when the remedial work has been completed.
- Nature and frequency of verification activities are appropriate (note topic specialists are likely to be involved here):
 - Frequency: For most verification activities (e.g. TR testing, F & G testing) this is not to exceed 1 year. It should be noted some activities will be aligned to Risk Based Inspection periods or major survey timescales where the vessel is classed.
 - Nature: this is more subjective and requires topic specialists to assess.
- A documented process exists for recording changes to verification activities including the ICP's comments on the changes. The method and criteria for changes to verification activities must be clear.

Appendix 12: Performance standards

Objective

To ascertain whether appropriate performance standards exist for SCEs for an installation.

Rationale

Regulation requires that the duty holder's ICP make professional judgements as to whether SCEs are suitable. Criteria are required for this judgement. These criteria are normally referred to as performance standards. To be appropriate they must be specific to an installation and derived from the installation's safety case (and associated safety studies). However, the responsibility for SCEs and their effectiveness etc remains with the duty holder.

A performance standard should specify what is required from an SCE to control the major accident hazard or hazards and be derived from risk studies. For example, the size of a fire or gas cloud before it grows to a size that could result in a major accident should be defined. This is likely to be installation specific and module specific. Therefore, in this example there should be evidence from the PFEER assessment that this analysis has been undertaken and the results used to set the performance standard. For an existing installation, the SCE capability should be reviewed against what is required to ascertain whether it is suitable. Again, evidence should exist that this has occurred.

Benchmark

- PFEER
- Step Change in Safety: Assurance and verification a practitioner's guide.

Critical success criteria

- Performance standards exist for all the SCEs.
- They are regularly reviewed and revised.
- Criteria within the standards are derived from major accident studies, SIL assessments and / or QRA. This linkage between major accident hazard scenarios and SCEs and their performance must be transparent and installation / module specific. Evidence for this process must be clear and demonstrative and could be examined by both IMT and Topic inspectors. However, the SIL values are likely to require examination by a specialist in the appropriate area.
- For appropriate SCEs the required availability must be given and derived from SIL assessments or QRA.
- They contain measurable criteria or reference assurance routines that link to the ICP's verification activities.

Appendix 13: Competence and independence of ICP

Objective

To check that the duty holder receives independent and competent advice on the suitability of their SCEs.

Rationale

Verification assessment of the suitability of SCEs should be independent from the duty holder's own system.

Benchmark

- SCR05 regulation 2(7)

Critical success criteria

- Principles for independence are within the scheme and conform to those expected from SCR05, regulation 2(7).
- Duty holder ensures that ICP meets the criteria for independence.
- Duty holder has defined competence requirements for ICP and has checked their ICP against the criteria.
- Duty holder checks that the ICP meets the competence levels and in particular:
 - Their competence is relevant to the SCEs;
 - They are aware of the key regulatory requirements in SCR05, DCR, PFEER etc.;
 - The team deployed by the ICP have the necessary in-depth and cross-discipline competences and;
 - Continuing competence is being assured;
 - They have a thorough understanding of major accident hazards specific to that facility; safety critical elements; and SCE verification and performance standards;
 - They are aware and have an understanding of key information documented in the installation Safety Case; main plant isolatable inventories; incident escalation pathways; and prevention, control and mitigation barriers;
 - They have an awareness of process safety and integrity management principles, engineering standards and specifications ;
 - They have relevant plant knowledge, understanding of operational status / plant conditions and suitable experience;
 - They are able to apply ORA process and methodology;
 - They can understand SCE impairment rule sets;
 - They have an understanding of specific site emergency response plans and procedures; and
 - They are aware of the suitability and limitations of ORA process.

Appendix 14: Requirement to revise the Verification scheme

Objective

To check that the duty holder revises (in consultation with the ICP) the verification scheme when changes to the installation are made that may affect the performance required from an SCE or introduce additional SCEs.

Rationale

There can be a number of occasions during an installations life that the performance required from SCE(s) may change. For example, the process plant may be modified, additional modules added, different products introduced, temporary safety critical plant introduced (e.g. well test equipment, coiled tubing equipment). SCR05 requires that the SCE will be suitable after the changed have been made.

Changes may introduce the need for additional verification activities. These must be defined prior to the change and the ICP consulted.

Where more than one ICP is involved then interfaces etc. between them must be considered.

Benchmark

- SCR05 regulations 2(7), 19 & 20
- Step Change Verification tier 3

Critical success criteria

- A process exists for finding when changes to the installation require the introduction of additional verification activities. For example, regular meetings are held between the duty holder and ICP to identify such changes.
- Safety critical temporary equipment is subject to the same regime and rigour as other changes.
- Evidence that proactive verification activities are undertaken for changes or that the requirement for them is considered in advance of the change and both the ICP and DH agree they are not necessary.
- Where there is more than one ICP involved, the interfaces and arrangements of communication are defined.
- For projects, the installation duty holder is the primary customer for the project verification and is involved in resolving the findings. Where the ICP for the project is appointed by the contractor, the installation's ICP must be involved to form an opinion on the initial suitability of the SCEs affected.

Appendix 15: Multiple ICPs

Objective

To check that the verification process is adequate to deal with multiple ICPs.

Rationale

It is possible that for operational verification that a DH may use more than one ICP. Furthermore, when a project is commissioned the DH may appoint another ICP to verify the initial suitability of new or modified SCEs.

Benchmark

- SCR05 regulations 2(7), 19 & 20
- Step Change Verification tier 3

Critical success criteria

- A written process exists for the communication of information between all the parties involved. Thus, interfaces, roles and responsibilities must be defined as well as the information required by each body.
- All ICPs are consulted on this process.
- The duty holder is clear as to the role of the each ICP and how initial and operational suitability is verified and by whom.
- The interface between the well examination scheme and verification is well defined and is summarised in the written scheme of verification. Again, the arrangements for communication information pertinent to the schemes must be written down, along with which examiner does what verification activity.
- The duty holder has a process for monitoring the communications between all parties to ensure the scheme operates as intended and that the verification (or examination) activities for the SCEs are carried out.

Appendix 16: Re-tendering of ICP contracts or change of duty holder

Objective

To ensure the scope, nature and frequency of ICP verification activity remains effective.

Rationale

When ICP contracts come up for re-tendering there could be pressure on the quantity and quality of verification activities to be reduced to minimise costs.

When the duty holder changes the management of SCEs and verification is also likely to change.

Benchmark

- The verification scheme and revisions that have been agreed with the previous ICP give a baseline of what was considered to be the correct nature and frequency of ICP's verification activities.
- ED inspectors should examine the criteria used by the duty holder to evaluate tenders.

Critical success criteria

- The quality and quantity of ICP activities remain effective.
- There is a documented process for the handover of outstanding ICP findings.

Appendix 17: Performance Assessment Criteria

EMM RISK GAP					
EXTREME	SUBSTANTIAL	MODERATE	NOMINAL	NONE	NONE
TOPIC PERFORMANCE SCORE					
60	50	40	30	20	10
Unacceptable	Very Poor	Poor	Broadly Compliant	Fully Compliant	Exemplary
<p>Unacceptably far below relevant minimum legal requirements.</p> <p>Most success criteria are not met.</p> <p>Degree of non-compliance extreme and widespread.</p> <p>Failure to recognise issues, their significance, and to demonstrate adequate commitment to take remedial action.</p>	<p>Substantially below the relevant minimum legal requirements.</p> <p>Many success criteria are not fully met.</p> <p>Degree of non-compliance substantial.</p> <p>Failures not recognised, with limited commitment to take remedial action.</p>	<p>Significantly below the relevant minimum legal requirements.</p> <p>Several success criteria are not fully met.</p> <p>Degree of non-compliance significant.</p> <p>Limited recognition of the essential relevant components of effective health and safety management, but demonstrate commitment to take remedial action</p>	<p>Meets most of the relevant minimum legal requirements.</p> <p>Most success criteria are fully met.</p> <p>Degree of non-compliance minor and easily remedied.</p> <p>Management recognise essential relevant components of effective health and safety management, and commitment to improve standards.</p>	<p>Meets the relevant minimum legal requirements.</p> <p>All success criteria are fully met.</p> <p>Management competent and able to demonstrate adequate identification of the principal risks, implementation of the necessary control measures, confirmation that these are used effectively; and subject to review.</p>	<p>Exceeds the relevant minimal legal requirements.</p> <p>All success criteria are fully met.</p> <p>Management competent, enthusiastic, and proactive in devising and implementing effective safety management system to 'good practice' or above standard. Actively seek to further improve standards.</p>
EMM INITIAL ENFORCEMENT EXPECTATION					
Prosecution / Enforcement Notice.	Enforcement Notice / Letter.	Enforcement Notice / Letter.	Letter / Verbal warning.	None.	None.