

The Offshore Thorough Review Process And Summaries Inspection Guide

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This inspection guide (IG) outlines an approach to the inspection of duty holder's arrangements with respect to the process for managing thorough reviews (TRs) and producing TR summaries, and the key areas that inspectors should consider when inspecting this topic. It also sets out the criteria for satisfactory and unsatisfactory performance factors against which duty holder performance will be rated. References are made to technical standards and guidance that inspectors will use to form an opinion of legal compliance.

This guide is intended for use by primarily Offshore Major Accident Regulator (OMAR) inspection teams however, duty holders may benefit from the content in terms of understanding how they will be inspected by OMAR (the competent authority).

Regulation 23 of the Offshore Installations (Offshore Safety Directive) (Safety Case etc)

Regulations 2015 (SCR2015)¹ requires duty holders to thoroughly review their safety cases and submit a summary to the competent authority no more than five years after the date on which the safety case was first accepted, or the date of the last thorough review.

Introduction

The purpose of this IG is to provide information and guidance to OMAR inspectors to support the delivery of consistent and effective inspection of duty holder arrangements for achieving compliance with the requirements of regulation 23 around

- the management systems expected to be in place for a duty holder's thorough review process
- thorough review summaries

This IG highlights key areas for inspection and provides a framework against which inspectors can judge compliance, assign performance ratings, and determine what enforcement action, if any, should be taken with respect to any legislative breaches that may be found.

Relevant Legislation

SCR2015 regulation 23¹ states:

(1) A duty holder must thoroughly review a current safety case –

- (a) no more than five years after the date on which the safety case was first accepted by the competent authority under regulation 17 or 18; and
- (b) at suitable intervals not exceeding five years following the first review mentioned in subparagraph (a).
- (2) In addition to the thorough review under paragraph (1), a duty holder must thoroughly review the current safety case if directed to do so by the competent authority.
- (3) The duty holder must send a summary, including the results, of each such review to the competent authority –
- (a) where the review is conducted at the direction of the competent authority, within the period specified by the competent authority in that direction; or
- (b) in all other cases, within 28 days of its conclusion.
- (4) The period specified by the competent authority for the purposes of paragraph (3)(a) must be a period of at least 28 days starting on the date of the direction.

Further guidance is provided in L154⁽¹⁾, this guidance has been further interpreted within Appendix 1 and as such L154 should be referred to when using this guide.

Action

Inspection of Thorough Review Process

The objective of an inspection of the thorough review process is to ensure that a duty holder has adequate arrangements in place, through the application of their current safety and environmental management system (SEMS), for thoroughly reviewing a safety case; consideration of HSG 65⁽²⁾ is useful for considering the following high level aspects:

Plan (Processes)

- is there a process in place to manage the thorough review within the organisation?
- does the process fully define scope /structure and frequency?
- what are the arrangements for implementation and review of the process?

Do (Accountability and Competence)

- are the roles clearly defined and the competencies necessary stated?
- are the persons suitably trained and competent?

Check and Act (Assurance)

- how will effectiveness be measured?
- have any lessons learned been captured to improve the arrangements in place?

Refer to Appendix 2 for further information.

Inspection of thorough review summaries

The summary must be kept at an address in Great Britain and should contain as a minimum

- confirmation that the review has been carried out, when it started and how long it took
- the identities of the persons who led the review (their role within the organisation) and of those who carried it out
- a description of how the review was carried out or a reference to an existing review procedure that was followed
- summaries of all revisions made to the safety case as a consequence of the review
- which new or different regulations, standards or knowledge were taken into account during the review (i.e. that were not considered when the safety case was originally prepared or during an earlier review) and the impact they had
- how the review was independent of the present safety case duty holder(s) (if applicable).

Refer to Appendix 2 for further information.

When carrying out inspections covered by this IG inspectors shall

- check the issues raised against the success criteria above and in Appendix 2
- use the performance descriptors in Appendix 4 to
 - determine the appropriate performance rating (HSE inspectors only)
 - the initial enforcement expectation
 - consider how and when the issues raised during an inspection are to be closed out
- revise the intervention plan and targeted (strategic) approach for the duty holder through the planning process depending on the outcome of the inspection

Background

The purpose of a thorough review is to provide duty holders, the workforce, and the competent authority with a level of confidence that the current safety case, which exists for the lifetime of the installation, continues to be fundamentally sound.

Maintaining a safety case to ensure it reflects the current state of the installation, its operations and correcting any errors is a requirement that should be driven from within a duty holder's management system with sufficient resources to manage effectively; and is a requirement of SCR2015¹ regulation 24.

The production of a TRS provides the duty holder with a tangible point in time documented level of assurance that their management system and safety case are robust. To ensure a degree of objectivity is obtained the duty holder might consider using an individual and / or team who are independent of those with the responsibility of maintaining the safety case. The individuals may be sourced from in-house or an external body.

The TR should

Examine assumptions - should consist of a systematic examination of the basic assumptions made in the case.

Take account of changes - identification of changes in design parameters, ageing processes and changes in operating philosophy, management system or conditions that may limit the technical design life of the installation or affect its safety and environmental critical elements (SECEs). This includes a comparison against relevant changed industry standards and industry practices for new installations with advancement in technology. Appendix 2 provides further information.

Consult with the workforce – the workforce should be engaged and consultation and feedback sought on the current and future case for safety for the installation.

Improve demonstrations – confirmation that the case, with any necessary updates or reasonably practicable improvements to enhance safety, remains adequate and is likely to remain so until the next thorough review.



Capture population data – HSE maintains and publishes population data on hydrocarbon containing equipment and systems on UKCS offshore installations as part of the HCR database. This database is the primary source of hydrocarbon release information and leak frequency data for supporting risk assessments including QRAs for offshore installations. These risk assessments are used to support risk-based decisions and are an important input to many decisions offshore, both for design, modifications and operations support. To maintain the population data, duty holders are requested to provide the population data for each of their installations as part of the TR process, using the Population Data Questionnaire form and associated guidelines developed in conjunction with Oil & Gas UK.

The TR should not

- address any recent inspection concerns as these may distort the duty holder's objectives in carrying out the review. These should be dealt with via normal intervention methods
- take the place of monitoring the safety case to ensure its ongoing suitability and, when appropriate, making necessary revisions

Other relevant inspection guides

[Offshore SECE Management and Verification Inspection Guide](#)

[Inspection of Operational Risk Assessments](#)

Specialist Advice

Specialist inspector	Elements contained within thorough review summary
Wells	<ul style="list-style-type: none"> • New platform based or subsea wells being introduced • Plugging and abandoning of wells • Changes to well design • Do the assumptions and conditions remain valid from the accepted safety case from a wells perspective
Pipelines	<ul style="list-style-type: none"> • New / changes to subsea tie backs / risers (import lines) • New / changes to export routes • Changes to riser emergency shutdown valves or systems • De-rating of lines due to integrity threats • Changes to Pipelines Safety Regulations which include the revision to the definition of the major hazard pipelines to potentially include the methanol pipelines • Changes to the MAPD
Fire, Explosion and Risk Assessment	<ul style="list-style-type: none"> • Revised QRA or fire risk analysis • Changes in inventory • Changes to number of PoB • Review of the basic assumptions made in the safety case which could affect the risk reduction measures
Process	<ul style="list-style-type: none"> • Changes to inventory / process design – cumulative effects • Changes in operating conditions including particular attention to CITHP, water cut, H₂S (souring of wells) with impact to topsides equipment
Mechanical	<ul style="list-style-type: none"> • Changes to integrity management system (eg RBI scheme, increased use of non-invasive inspection, review of temporary repairs) • Changes to maintenance management system • Changes to SECEs – mechanical aspects • Rotating machinery performance reviews / upgrades • Lifting procedure reviews / audits or changes

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	<ul style="list-style-type: none"> • Changes / reviews of platform cranes
Materials and Corrosion	<ul style="list-style-type: none"> • Changes to integrity management system (including organisation), corrosion management strategy and risk based inspection strategy • Changes in operating conditions resulting in change to corrosion risk of topsides pipework and vessels e.g. well souring, increased water cut, increased erosion • Changes to measured corrosion rates • Changes as a response to corrosion related failures • Issues identified as a result of ageing and life extension strategy review
Electrical Control and Instrumentation	<ul style="list-style-type: none"> • Changes to functional safety assessments stage 4 (FSA4) • LOPA / HAZID studies relating to FSA4 • Changes to maintenance management strategy – EC&I elements • Upgrades or addition to new EC&I equipment
Verification	<ul style="list-style-type: none"> • Change of verifier • Changes to verification scheme • Changes to SECEs
Evacuation, Escape and Rescue	<ul style="list-style-type: none"> • Recent changes in plant layout that may impact on ER • Changes to number of PoB • Changes to means of evacuation (e.g. introduction of Skyscape) • Changes to means of escape (e.g. Donuts added/removed) • Addition of W2W / other means of access / egress • Signification changes to PFEER assessment • Any revisions in ER related guidance accounted for in review
Structural	<ul style="list-style-type: none"> • Impact of changes to structural codes and standards • Impact of new or revised structural assessments • Modifications to structural arrangement • Changes in operations resulting in altered structural loading • Changes in approach to structural integrity management
Human Factors	<ul style="list-style-type: none"> • Managing human failure (safety critical task identification and human reliability analysis)

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	<ul style="list-style-type: none"> • Procedures for safety-critical tasks • Competence for managing MAH (safety-critical task and role-specific competences, non-technical skills) • Fatigue risk management (including rota changes and shift design) • Staffing and workload for safety-critical roles • Safety-critical communications (shift/tour handover, communication with clients, contractors, subcontractors) • Human factors in design (control room, alarm system, modification projects) • Maintenance, inspection and testing (PTW, isolation management, inhibit management, SECEs including PMs) • Organisational culture - for example if there have been significant changes to the organisation (e.g. mergers/takeovers) or significant campaigns to improve the safety culture of the organisation
Occupational Health and Hygiene	<ul style="list-style-type: none"> • Increase/decrease in maximum PoB • Change in status e.g. attended to non-attended installation (NUI) or vice versa • Construction of new/additional facilities
Diving	<ul style="list-style-type: none"> • Changes to diving SEMS • Changes that affect accepted case for diving
Marine Integrity	<ul style="list-style-type: none"> • New knowledge and data- e.g. identification of new failure modes or higher failure rate from inspection/industry (e.g. trenching of seabed in semi-taut mooring systems) • Consideration of MAHs in view of major industrial events since previous thorough review. (e.g. Deepwater Horizon, DP failures) • New industry standards and guidance available (e.g. airgap guidance for semi-submersible units) • Validity of design assumptions, conditions (e.g. extreme weather statistics, mooring chain wear and corrosion rates, marine growth) and criteria • Ability to achieve (or not) assumed reliability of structures, equipment and components

	<ul style="list-style-type: none"> • Innovation and cost-effective means of risk reduction to ALARP • Lightship weight and centre of gravity changes
BEIS / OPRED Environmental Information (EI) Environmental Operational Control (EOC)	<ul style="list-style-type: none"> • An amendment to Environmental Information that could result in a change to the Major Environmental Incident conclusions. • Changes to SEMS • Changes to Verification Scheme or ICP

Organisation

Targeting

Inspections of the thorough review process should ideally be carried out in accordance with OMAR intervention plans and therefore identified as part of the planning process and form part of the intervention plan submitted for the duty holder. However, intelligence gathered during the year of delivering the intervention plan may subsequently result in the requirement for a thorough review inspection.

Timing

Inspectors should undertake thorough review process inspections as part of the agreed OMAR intervention plan; when intelligence indicates intervention is necessary e.g. one year prior to submission of a thorough review summary, or upon receipt of a poor thorough review summary. The timing of the TRS inspection will be dependent on the timing for submission; this typically derives from when the safety case was first accepted or the completion of the last thorough review.

Resources

Resources required for the undertaking of TR process inspections will be driven through the intervention planning process proposed by the inspection management team inspector based on their targeted strategy for inspection of the duty holder; this will include recent intelligence such as inspections or previously submitted TRSs.

Appendix 3 should be used to consider the requirement for additional specialist support to inspect the TRS.



Recording and Reporting

Thorough Review Process

The inspection of the TR process provides both the competent authority and the duty holder with a level of confidence that adequate arrangements are in place to produce a compliant TRS as required by the regulations. Inspection may result in enforcement; refer to appendix 4 for further details. Furthermore, it may result in increased inspection at the duty holder's office and / or offshore (via intervention planning) to test compliance against the minimum legal requirements and industry guidance.

Thorough Review Summary

The competent authority does not formally accept thorough reviews nor does it assess them; they will acknowledge receipt of the summary and will consider it for inspection. Inspection will be based on a number of factors including the output from any previous inspection of the process / arrangements in place. Inspectors will use the output from the inspection to establish the duty holder's conformity with the safety case and other relevant statutory provisions. It may result in changes to intervention plans or guide future intervention planning for the duty holder.

Appendix 1 Sample Inspection Agenda

Onshore Inspection of Thorough Review Process

Onshore	<p>Items to be provided in advance:</p> <ul style="list-style-type: none"> • Copy of process / procedure for conducting thorough reviews • Roles and responsibilities of key persons accountable for conducting thorough reviews • Audit and assurance processes output in place for the process / procedure for conducting thorough reviews • Latest action tracker and updates on progress of actions from the thorough review output <ol style="list-style-type: none"> 1. Introduction 2. Topic specific sessions <ol style="list-style-type: none"> a. Presentation on the approach and methodology adopted by organisation to manage thorough reviews b. Evaluation of processes and systems in place, defined roles, competencies required, and audit and assurance process applied to verify that process is complied with and outcomes captured to develop approach going forward. 3. Close
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Appendix 2 Inspection Questions and Success Criteria

No	Wording from L154	Inspection of Process / Summary	Reference Paragraph
1	'Continues to be fundamentally sound'	<p><u>Process</u></p> <ul style="list-style-type: none"> • Has the process described how it ensures the case remains fundamentally sound? • What methodologies does it use to review the case and are these suitable? <p><u>Summary</u></p> <ul style="list-style-type: none"> • Confirmed a periodic check of legal changes / new requirements? • Reviewed the managed changes, are they filtered on SECE affected management of changes (MOCs)? • Are all major accident hazards (MAHs) identified, including any new MAHs introduced from any changes? • Does it state that the existing ALARP demonstration is acceptable for the known MAHs, or have additional ALARP demonstrations been documented? • Has a review of the SEMS been conducted and what does it indicate; how effective is the SEMS? 	279
2	'Identify the need for a thorough review'	<p><u>Process</u></p> <ul style="list-style-type: none"> • Has the process captured the various reasons for conducting a thorough review i.e. within 5 years of accepted case, significant change in circumstances, directed to by the competent authority? 	279, 281

		<ul style="list-style-type: none"> • Significant change in circumstances e.g. new major accident hazard, large scale de-complexing / conversion of process, early decommissioning, major change in reservoir conditions, major change in structure stability (fixed or mobile). The findings from the thorough review may identify the material changes necessary and therefore a material change submission may be required as per regulation 24(2). <p><u>Summary</u></p> <ul style="list-style-type: none"> • Does it state the reasons for conducting the review? 	
3	'Examine the basic Assumptions'	<p><u>Process</u></p> <p>Has the process stated that the following shall be assessed as part of the thorough review?</p> <ul style="list-style-type: none"> • Design and operational parameters of the structure and plant (e.g. for floating structures – weight and centre of gravity changes) • Data and experience of operational status and expected lifetime • Maintenance, inspection and testing experience of SECEs • Physical modifications to the installation SECEs • Modification effects on interacting SECEs • New knowledge and understanding • Changes to safety critical roles and human factors considerations • Changes to staffing levels or competence arrangements <p><u>Summary</u></p>	282

		<p>Does the summary demonstrate that the following has been considered:</p> <ul style="list-style-type: none"> • Design and operational parameters of the structure, plant and wells including subsea wells <p>Examples</p> <ul style="list-style-type: none"> ○ Fatigue and corrosion life of the topsides and structure ○ Hydrocarbon inventory changes due to equipment being added or removed. ○ Population of equipment changes (e.g. pumps, separators, tanks, vessels) e.g. population equipment changes that require update to the HCR database) ○ Additional temporary repairs over sustained periods of time with no target to remediate to original design intent • Data and experience of operational status and expected lifetime <p>Examples</p> <ul style="list-style-type: none"> ○ Measured corrosion rates ○ Vibration cycles and structural loading parameters ○ Souring of wells (High H₂S) ○ Abnormal events ○ Operating with long term overrides / inhibits ○ Ageing and life extension work • Maintenance, inspection and testing experience of SECEs <p>Examples</p> <ul style="list-style-type: none"> ○ Review of records for emergency shut down valve closure tests 	
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		<ul style="list-style-type: none"> ○ Adequacy of inspection and testing regimes ○ Increased frequency of inspection / maintenance due to failures ● Physical modifications to the installation SECEs (typically via a management of change process) <p>Examples</p> <ul style="list-style-type: none"> ○ Changes to the types of fire and gas detectors (not like for like) ○ The effects of changes on detectable leak sizes ○ Conversion from helicopter access to walk-to-work ● Modification effects on interacting SECEs <p>Examples</p> <ul style="list-style-type: none"> ○ Review of escape, evacuation and rescue arrangements after access/egress routes are modified or decommissioned ○ Ongoing impaired SECEs (ORA) ● New knowledge and understanding <p>Examples</p> <ul style="list-style-type: none"> ○ New guidance and standards produced since the previous review ○ Any major accidents that have occurred since the last review ○ Awareness of risks highlighted by industry or HSE safety alerts such as temporary repairs, findings from relevant research (engineering and human sciences) or regulatory interventions ○ The publication of new or revised codes, new technology, output from revised HAZOPs, risk assessments and other techniques used to construct the original arguments for safety. 	
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		<ul style="list-style-type: none"> ○ Lessons learned internal and external ● Changes to safety critical roles and human factors considerations <p>Examples</p> <ul style="list-style-type: none"> ○ Adequacy of safety critical roles - staffing levels / dual responsibility ○ Arrangements for ensuring competence of safety critical roles ○ Human factors assessments undertaken for identified safety critical tasks. ○ New safety critical tasks (e.g. created by new equipment / SECEs on board) and associated human reliability analyses 	
4	'To ensure objectivity'	<p><u>Process</u></p> <ul style="list-style-type: none"> ● Has the process indicated the use of review team members, or at least a team leader from a group of staff who are independent of those responsible for routinely revising the case, or an external consultant? <p><u>Summary</u></p> <ul style="list-style-type: none"> ● Are the responsible persons for managing the thorough review summary sufficiently independent from managers / leaders responsible for routinely revising the case? 	282
5	'consult installation safety representatives'	<p><u>Process</u></p> <ul style="list-style-type: none"> ● Has the process specified the requirement to consult with installation safety representatives and a suitable manner by which this will be conducted such that they can make a timely and effective contribution to the review process? 	283

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		<u>Summary</u> <ul style="list-style-type: none"> Has the summary incorporated input from the safety representatives? 	
6	'which new or different regulations, standards or knowledge were taken into account during the review and the impact noted'	<u>Process</u> <ul style="list-style-type: none"> Has the process specified the requirement to list within the summary which new standards, regulations and knowledge have been taken account of during the thorough review, and to describe the impact they had? <u>Summary</u> <ul style="list-style-type: none"> Has the summary explicitly listed (possibly in appendices) which 'new standards', 'new or changed regulations' and 'new knowledge' it has taken account of? Regarding 'new knowledge', consider inclusion of a description of any operational records that have been reviewed and changed, new studies conducted, different external sources of information considered etc, and the conclusions arising from each that then drove a change and impact. 	285(e)

Appendix 3 Typical Documentation Used

An example list of documentation that could be used as part of the systematic thorough review of a safety case

- Current safety case and previous material changes – cumulative effect
- Previous thorough review summary
- Performance standards for SECEs and current health status reports of SECEs
- Current operational risk assessments in place
- Hazardous area drawings
- Management of changes conducted on the installation over the last 5 years
- Fire and gas detection layout drawings
- Integrity management reports and strategies for installation
- Installation emergency response plan
- Outputs from major audits / assurance reports conducted over last 5 years
- Annual installation ICP / verification reports produced over the last 5 years
- Current operating procedures for the installation (e.g. major changes to)
- Most recent plant wide HAZOP and LOPA re-validation conducted for installation and a record of actions closed and outstanding
- Process and instrumentation drawings
- Cause effects diagrams
- General arrangement and plot plans
- Previous non-material changes made to the safety case
- Trip settings
- Relevant incident data for the installation (near misses, reported incidents)
- Lessons learned database
- Alarm management KPIs
- Forward strategy for any corporate SEMS changes / initiatives planned.
- Installation QRA reports
- Audit output for process safety audits conducted on installation
- Relevant statutory provisions, codes of practice and guidance changes over last 5 years
- Long term plans for installation / forward strategy
- Current and projected well conditions for installation
- Major accident prevention document (MAPD)

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Offshore Petroleum Regulator
for Environment & Decommissioning



- Load plan for installation
- Well integrity status due to routine monitoring and yearly reports from well examiner

Appendix 4 Application of EMM and Duty Holder Performance Assessment

When using the Offshore Thorough Review Process And Summaries Inspection Guide, duty holder compliance is to be assessed against the relevant success criteria.

The success criteria have been determined from specific regulatory requirements, defined standards, established standards or interpretative standards.

This assessment will determine the: EMM Risk Gap, the associated topic performance score together with the Initial Enforcement Expectation as shown in the table below.

The actual enforcement may differ depending on duty holder and strategic factors. **However, should this occur then the relevant duty holder and strategic factors should be identified.**

Further guidance can be found at: <http://www.hse.gov.uk/enforce/emm.pdf>

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
<i>Optional IG Specific Performance Score Guidance (delete if not used)</i>					
<i>Specific IG Guidance</i>	<i>Specific IG Guidance</i>	<i>Specific IG Guidance</i>	<i>Specific IG Guidance</i>	<i>Specific IG Guidance</i>	<i>Specific IG Guidance</i>
EMM Initial Enforcement Expectation					
Prosecution / Enforcement Notice	Enforcement notice / Letter	Enforcement notice / Letter	Letter / Verbal warning	None	None

It should be noted that:

- the inspection guide and hence the allocated scores may not cover all the matters that were considered during the intervention.
- the intervention may not necessarily have used every part of the inspection guide – consequently the score only reflects what was inspected.



- the allocated performance score only reflects regulatory judgements about a duty holder's degree of compliance at a particular point in time.

Use of performance scores

HSE use the performance scores as one of the many inputs to prioritise and plan future regulatory interventions. Prioritising interventions is fundamental to ensuring HSE delivers its major hazards regulatory strategy whilst supporting businesses and the GB economy. HSE aims to ensure that regulatory activity is proportionate to the risk to people taking account a duty holder's performance in controlling risks. In general, this means HSE will inspect major hazard installations and duty holders with relatively poorer risk management performance more frequently and in greater depth than lower hazard installations and duty holders where there is evidence of higher risk management performance.



Appendix 5 References

- 1 The Offshore Installations (Offshore Safety Directive) (Safety Case etc) Regulations (SCR 2015) L154 <http://www.hse.gov.uk/pubns/books/l154.htm>
- 2 Managing for Health and Safety (HSG65) <http://www.hse.gov.uk/pubns/books/hsg65.htm>