



Assurance

Guidelines

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List of Abbreviations

Abbreviations	Definitions
ALARP	As Low as Reasonably Practicable
CEO	Chief Executive Officer
CMAPP	Corporate Major Accident Prevention Policy
EI	Energy Institute
HSAWA	Health and Safety at Work Act 1974
HSE	Health, Safety & Environment
HSE	Health & Safety Executive
HSG	Health and Safety Guidance
HQ	Headquarters
HMI	Human Machine Interface
ISO	International Standards Organisation
IVB	Independent Verification Body
KPI	Key Performance Indicators
MAH	Major Accident Hazard
MHSW	Management of Health and Safety at Work Regulations 1999
NAO	National Audit Office
OIM	Offshore Installation Manager
ORA	Operational Risk Assessment
PSM	Process Safety Management
PSV	Pressure Safety Valve
SCR	Safety Case Regulations 2015
SECE	Safety and Environmental Critical Elements
SEMS	Safety and Environmental Management Systems
SIMOPS	Simultaneous Operations
SMART	Specific, Measurable, Achievable, Realistic, Time bound
ToR	Terms of Reference

1 Introduction

1.1 Background

In 2018 the Health & Safety Executive wrote to all duty holders in the UKCS highlighting the importance of managing hydrocarbon releases. The letter identified that poor process plant condition and management system weaknesses were typical underlying causes of hydrocarbon releases. The letter also pointed to continued shortcomings in areas of effective assurance (audit, monitor and review). A work group was formed to assist the industry improve in this area by describing effective assurance activities, providing examples of effective systems, and to promote and share good practice.

In 2019 industry leaders agreed to a set of [Principles of Process Safety Leadership for the offshore UKCS Oil & Gas Industry](#) for effective process safety management. These guidelines support the implementation of elements of the principles in the areas of:

- Process safety leadership requires senior leadership **team involvement**, understanding and competence.
- Good process safety management requires constant **active engagement and vigilance**.
- **Robust and regular auditing** of the safety management system and associated major accident hazard barriers, is essential to ensure that system weaknesses are identified and process safety risks are being effectively managed.
- **Publication** of process safety performance information provides important assurance about the management of risks by an organisation.
- **Sharing good practice** across industry sectors in order to learn and implement lessons from relevant incidents occurring internally and externally to the organisation, is important to maintain the currency of corporate knowledge and competence.

These guidelines provide information relating to good practices in the implementation of an assurance framework with a focus on the prevention of major accidents which will also address regulator concerns over the prevention of hydrocarbon releases. It is supported by a case study throughout the document and will be complemented by training for leaders and those that will be required to conduct assurance activities.

The assurance framework is the implementation of a systematic and risk-based process for the auditing, monitoring and review of the suitability and effectiveness of risk management processes for offshore operations. The document has not formally recommended industry definitions of terms, such as assurance, verification, audit, monitoring and review, due to the different terminology already in place across the oil & gas industry. Instead it focuses on a generic framework that can be adapted to suit organisational terminology based upon the following terms used within the document:

- Assurance - the overarching approach to provide a programme that captures, audit, monitor, verification and review.
- Audit - a formal and planned activity, with independence, to confirm that an entity's safety and environmental management system (SEMS) is effective.
- Monitor - the ongoing checking of an element of the SEMS or major accident hazard (MAH) barrier model to ensure that it remains fit for purpose.

- Verification - an activity normally undertaken in the field to verify that what should be happening in the field, is actually occurring. Normally led by site supervision and involving a discussion with the team about to conduct a task or at a critical point of the task.
- Review - an assessment of findings and actions to ensure that underlying causes have been identified, the assurance process is fit for purpose, actions are appropriate and prevent recurrence of future similar findings.

The term 'audit and verification' is outlined in Safety Case Regulation (SCR) 2015. The processes described within this guideline should address the regulatory requirement for audit and go further in building the lower level processes for monitoring and reviewing the effectiveness of the Safety and Environmental Management System (SEMS). The formal requirement for Independent Verification Body (IVB) verification in the regulations is different to what is described within these guidelines. Use of the word 'verification' is common to describe other aspects of organisations internal processes and is used here in this context.

The guideline introduces a consistent terminology in terms of what is being audited / reviewed, which could be described as confirming the effectiveness of the SEMS (aligning with the terminology for "audit" in SCR) for managing major accident hazard risk.

This guideline outlines the roles and responsibilities for persons involved in assurance activities, provides a proposed structure for undertaking assurance across an organisation, and guidance based upon the learnings and experience from the work group who contributed. The guideline is supported by a case study to aid the understanding of the tangible benefits from implementing a robust assurance process that will drive regulatory compliance and reduce the risk of process safety events / hydrocarbon releases.

It should be noted that this document provides practical steps to take to build and deliver assurance activities. It is not exhaustive and is not intended to replace existing obligations for managing wider health, safety and environment aspects of offshore oil and gas production as part of the recognised UK risk management framework of 'Plan, Do, Check and Act'.

The assurance guideline is supported by awareness training at a leadership and practitioner level. This training has been developed and will be delivered by a team from across the industry who are currently involved in implementing assurance programmes. Additionally the guideline is supported by an assurance gap analysis form to allow for an organisational review of current assurance arrangements against industry good practice.

2 Organisational Structure

The primary role of assurance activities is to assist the organisation to protect people, the environment, assets and reputation. Effective assurance should provide confidence and confirmation that risk control measures are working effectively. The process challenges the organisation to look closely at itself, identify areas for improvement, to enhance the effectiveness of governance, risk management and risk control measures. The roles, objectives and deliverables associated with assurance activities should be proportionate to the risk and visibly supported and endorsed by all managers, particularly the most senior managers in an organisation.

Assurance is a key element of safeguarding an organisation and improving performance. To enable this and attain the full value of assurance activities, the organisation must embody assurance within its management system. This can only be achieved through cultural acceptance of assurance at every level within an organisation and buy-in achieved by every tier: CEO to technician. To aid this embodiment, top level management should drive, be ambassadors and ensure focus on delivery and follow up. There must therefore be a clear assurance structure in place with ownership to deliver it:

- Sponsor - Lead champion in the organisation with influence and access to the highest levels of the management team. Ideally Operations Director, or similar level.
- Assurance Focal Point - The 'owner' of assurance and audit within an organisation with authority, influence, determination and drive to not only deliver the assurance plan, but also all follow-up activity is addressed in a timely manner across those in the organisation responsible for the delivery of sustainable actions.

The attitude with which an organisation responds to assurance findings, particularly 'weakness' or 'bad news', is strongly correlated to the effectiveness of assurance activities. Those organisations that invest in assurance welcome the findings from assurance activities. There must as a minimum be a culture of acceptance of findings, both good and bad, supported by a sense of chronic unease with regards to both strong and weak signals that the process produces, allowing learnings to be turned into specific and measurable actions to improve performance.

3 Assurance Activities

There are different types of assurance activities depending on the desired output of the assurance activity. When developing an assurance plan, a mix of audit types should be blended to provide the information, findings and awareness required to attain the maximum benefit and outcome of an effective assurance system. It is important that throughout the audits those participating approach the audit from a technical and non-technical viewpoint to ensure that the role the 'human' plays in the process is considered. This also aligns to expectations of regulations in relation to the effectiveness of an audit programme by ensuring sufficient focus, proportionate to the risk, on process, plant and people.

3.1 System Audits

'System audits' focus on management systems and determine the fitness for purpose of management arrangements, such as the Safety and Environmental Management System (SEMS). In essence these types of audit confirm that what organisation's say they do is the correct thing to do, to manage the risk, and checks that the system provides the level of risk control required.

Generally, system audits are conducted on the management system or parts of the management system to verify that the processes are documented and implemented against the requirements of specified requirements e.g. ISO 14000, ISO 45001, etc. This activity helps in the identification of non-conformances and improve the operation of the system being audited. System audits are by their nature a snapshot in time via a high-level review and the common practice is to select a small number of site activities to test compliance.

3.2 Technical Audits

Technical audits can determine the fitness for purpose of technical systems, such as processes, plant design and operations: this approach allows a deeper review of the risk controls from a technical perspective and that these are proportionate to the risk and ALARP. An example of a technical audit would be an in-depth review of small bore tubing management that could involve the relevant technical discipline, such as Technical Authority or Technical Safety Engineer, reviewing that small tubing is managed from an integrity viewpoint and in accordance with industry good practice and the risk associated is ALARP.

3.3 Compliance Audits

Compliance, also known as conformance checks, generally consider the human performance aspects of confirming that existing SEMS arrangements are being effectively implemented: this allows checks to be made that an organisation actually does what it says they will do.

The objective is to check that the organisation is meeting the requirements of its own risk control measures such as meeting the requirements of procedures, etc. When conducting a compliance activity, it is essential that the relevant internal processes and procedures are reviewed along with the

documents referenced and those internal/supporting documents. Good practice would include a review of the relevant statutory requirements and any associated guidance documents.

3.4 Regulatory Audits

Regulatory audits confirm whether an organisation's arrangements comply with relevant statutory provisions and whether ALARP risk control has been met and sustained. These are not regulatory inspections as part of the intervention plan that is issued annually by the regulatory bodies.

In terms of regulatory audits across the SEMS and MAH barrier model, the scope can consider hardware components of the management system such as Safety and Environmentally Critical Element (SECE) barriers, and also software such as manning levels, competency/ training and procedures/ operational barriers in terms of the "human" role. Human machine interface (HMI) in areas such as control room operations should also be considered. Regulatory audits are an important aspect of the assurance programme in determining regulatory compliance and there should not be any reliance on the regulator to find problems, particularly serious ones.

3.5 Workplace Monitoring

By undertaking formal workplace monitoring there will be a structured approach to looking at the effectiveness of control measures that should be in place for activities, with a focus on those activities that are deemed as high risk. The monitoring activity provides assurance, normally conducted by the asset leadership team, that the work that has been planned is being conducted as per the plan. It also allows for good practices to be identified and provides a mechanism for leadership to present at the worksite.

If conducted correctly and recorded in manner that allows trending workplace monitoring can provide early indication of potential issues via the identification of weak signals that could provide early insight into underlying causes.

Workplace monitoring can be viewed as a positive if delivered in the correct manner and as opposed to looking for non-compliances those undertaking workplace monitoring should be encouraged to look for findings that allow learnings to be implemented.

Good supervision is the essential first component of any effective assurance system. Performed well, it can have a significant positive impact on safety performance, staff morale and engagement. It can also help prevent hazardous mistakes, by identifying gaps in team members' knowledge, understanding or motivation. Expected standards of supervision are however not always formalised and competing priorities on a supervisor's time can mean that the quality and quantity of frontline supervision is not always ideal. Recognising its importance, some operators have formally described the activities and behaviours they expect of their supervisors. This has included the amount of time they should spend 'on plant' every shift, and the tasks they should focus on. Some operators also periodically monitor the hours of 'safety supervision' actually being achieved.

3.6 Assurance Arrangements

To meet the levels of required scrutiny at each tier of assurance, a defined set of assurance arrangements should be implemented. A structured and blended approach to the use of audit types provides a greater and richer perspective on an organisation's delivery both in terms of safety and performance. It allows for the identification of weak and strong signals in relation to the effectiveness of the management system and the strength of the major accident hazard barrier model.

The further down the assurance pyramid, the lower the audit skills competency requirements. To compensate for this lower audit skillset, the more prescriptive, structured and framed the audits should be. Although auditors may not require in depth auditor training, it is recommended that, for anything other than basic monitoring, checklists or tick box style questionnaires are avoided due to the lack of clarity and output value. Far greater worth can be elicited from guided, open questions.

3.7 Assurance Composition: Process Safety Management

In order to proactively determine the process safety 'health' of an organisation, audits should consider plant, people and process elements and their interactions. Plant performance is generally well developed via organisation KPIs and IVB verification; however, the human/plant interface e.g. isolations or breaking containment are seldom reviewed in terms of system assurance and generally the assurance that is done is compliance i.e. checking that systems or procedures as per company requirements. A review of the adequacy of the system and the risk control that it provides should also be considered as part of a process safety management framework. It is therefore essential, when question sets and Terms of Reference are developed that human interaction into the process is considered and managed.

The Energy Institute Process Safety Management Framework provides further information on good practices in use throughout the major hazard industries. [Energy Institute PSM framework](#)

Case Study Part 1 – Background

A duty holder operating a number of offshore production platforms was having recurring minor hydrocarbon releases across its operations. Investigation of the incidents identified that the immediate causes of the releases were attributable to integrity issues, which were addressed prior to plant re-instatement and commencement of operations. One of the underlying causes of the releases related to shortcomings in the inspection and maintenance of small bore tubing: these shortcomings were not known by the duty holder or picked up prior to the releases due to deficiencies in their audit, monitoring and review arrangements.

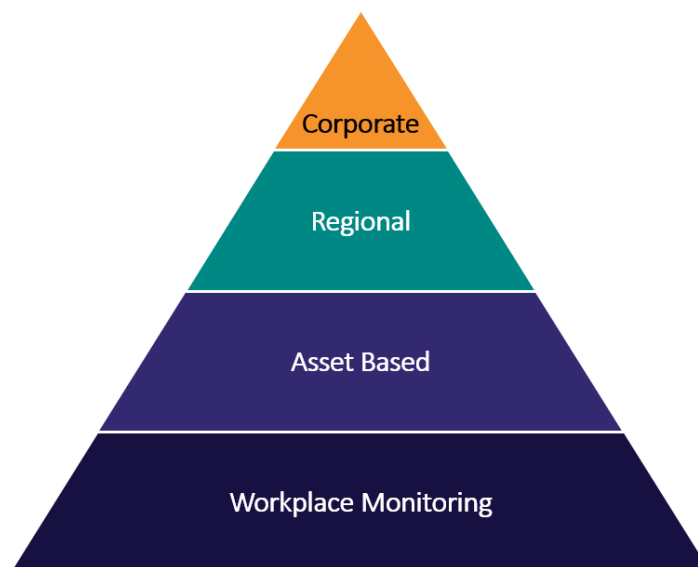
In addition to the minor hydrocarbon releases, over a sustained period of time (two to three years), authority inspections were repeatedly finding that elements of the safety case – the key major accident risk control systems - were not working as per design, not fully operational nor were the company assuring themselves that the risk control systems were effective. For example, PSVs on a gas compression line had not been reviewed following a change in plant operating conditions (identified during inspection), competency of control room staff had not been reviewed following the introduction of subsea tie-backs and a modification to the process and shut-down cause and effects (identified during an authority inspection) and ORAs were of poor quality with an incorrect risk matrix not suitable for low likelihood/high consequence events being used (identified during an authority inspection).

4 Assurance Framework: tiered approach

In order to provide a suitable, sufficient and comprehensive view of the effectiveness of the SEMS, a tiered approach to assurance should be considered. This provides perspective from the top level, corporate understanding, to the lowest level of operational delivery on the asset that can directly learn from the findings.

Figure 1 shows a typical arrangement for a company assumed to have a headquarters overseeing several regional operations. These arrangements may change for companies of different sizes. For example, a small company with only a single region may combine aspects of the corporate and regional in a single level, while a very large company may have additional levels. It is however expected that the scale of the company will not change the requirement for asset based and workplace monitoring activities.

Figure 1: Tiered approach to assurance structures



4.1 Corporate

- **Who:** Delivered and led by headquarters and by certified trained auditors.
- **What:** Assesses regional performance against the organisation's standards and rules by the use of a systems audit.
- **Where:** Regional offices and some site visits.
- **When:** Every 2/3 years.

4.2 Regional

- **Who:** Regional onshore based team. Delivered by internal auditors who can be trained by either internal or external arrangements.
- **What:** Independent view of individual assets and contractors with a focus on system and technical audit scopes.
- **Where:** Site based and onshore office.

- **When:** Annual plan with the scope and frequency determined on the basis of risk, past performance, weak signals, etc. This is part of a rolling programme.

4.3 Asset Based

Key to the effective delivery of asset-based assurance is the ability to ask open questions and follow through constructively on strong and weak signals.

- **Who:** OIM/Site Manager and supervisory team. Auditor training required utilising framework question sets. Key to the effective delivery of asset-based assurance is the ability to ask open questions and follow through constructively on strong and weak signals.
- **What:** Self-assurance of compliance that is normally directed towards high risk activities such as isolation management, flange management, lock open lock closed register management, long term isolation management. Assurance activity utilising framework question sets.
- **Where:** Site based.
- **When:** Weekly and monthly routine activity. Part of rolling programme determined on the basis of risk.

4.4 Workplace Monitoring

- **Who:** Site supervision, team leads, Elected Safety Representatives. No formal audit training required. Requires an element of being able to recognise issues and opportunities via an inquisitive approach.
- **What:** Permit to work, inhibits, simultaneous operations (SIMOPS) compliance, instrument measurements, breaking of containment, complex / complicated lifts, over the side work. Focussed in the area of compliance audit with an emphasis on human performance aspects.
- **Where:** Site based.
- **When:** Daily and weekly and can be identified during daily site planning meetings.

5 Assurance Programme: A Risk-based Approach

5.1 Rolling Programme

For corporate and regional levels, scheduling should be programmed on a rolling basis across all tiers of the assurance pyramid generally on a frequency of between two and three years. The plan should have greater levels of granularity at the asset level in terms of asset and key assurance focus areas. The workplace level is more dynamic and relates to the risk profile of the activity being executed at the worksite and as such, the plan should be fluid. However, the fact that assurance has been undertaken should be recorded. This rolling programme should also be 'live' with frequency supporting the risk and the content determined on a risk-based approach that is reviewed on a regular basis.

It should be noted that key risks are not always obvious and may not be identified by even an experienced individual. A weakness in a risk-based approach is that it requires pre-existing information to form a clear judgement of risk. Information from a range of sources may be used. The outcomes of the workplace monitoring and asset-based assurance activities may be used to identify trends or areas requiring more systematic audit as part of the regional or corporate programmes. Incidents and other lagging information often provide information to support a risk-based approach such as a hydrocarbon release or deviation from procedures. Industry level information and trends may also provide relevant information. In using such information sources, an understanding of major accident risk control measures is a pre-requisite to generate a robust assurance plan.

Most audit programmes are established based on assumed understanding of the status of MAH barriers (SECEs, procedures, etc) in terms of the actual or 'what is' status based on identified lessons, including weak signals, over a preceding period of time. A different approach would be to develop the programme based upon a review of the barriers on a 'what if' basis and ask 'at what point are we not safe to operate?' or 'how much degradation of the barrier would we need for there to be a problem?'. In this case the programme is based on the level of reliance on the barrier, as well as looking for signals (weak or otherwise) and underlying causes which may indicate the health of the MAH barriers. A process for developing an assurance programme is shown at figure 2 and explain further in subsequent sections.

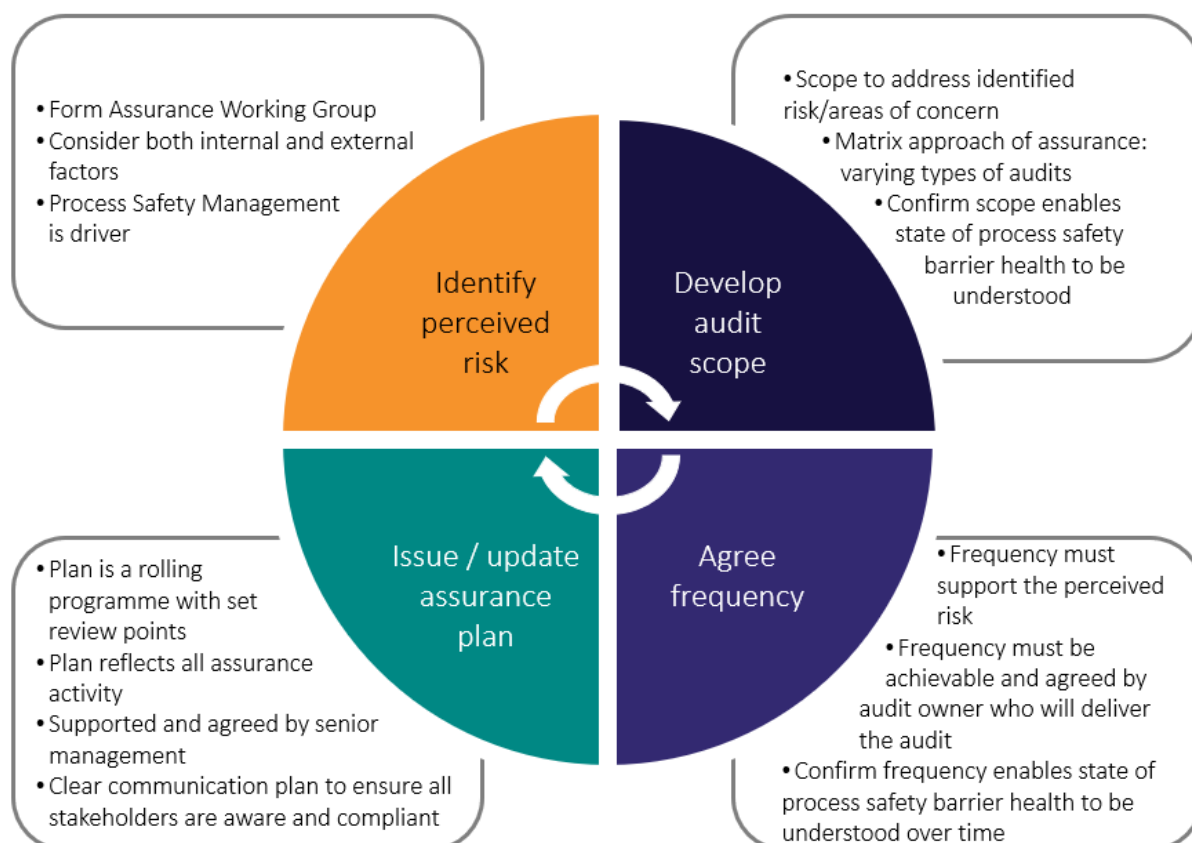
Weak Signal Example

A widely used phrase is a chronic unease that can be the feeling when something does not seem / feel right. By the adoption of this approach in terms of assurance it is possible to look at the less obvious underlying causes, that if a weak signal can give rise to a current or future issue / finding that manifests into a more serious issue. Some of these include an unusual noise/ smell coming from an area of the process plant, gauges/ meters giving unexpected readings, inaccuracies in the manner that documentation is completed.

By undertaking an assurance activity using a 'fresh set of eyes' it is possible to identify weak signals that may have become normalised by those who work on the asset on a routine basis. A sense of chronic unease ensures that those weak signals can be identified and acted upon to build resilience into the relevant barrier prior to an incident with consequence occurring.

The mind-set shift that is required is to welcome these as near misses in that there has not been a realised consequence and to take forward the learning whilst recognising those that find and report them to promote active engagement.

Figure 2: Process for a risk-based approach to assurance planning



5.2 Assurance Programme Design

When designing an assurance programme from new, or addressing a failing one, then emphasis should be placed on ensuring it has the start point of a detailed review of the Safety and Environmental Management System (SEMS). This approach will allow for a thorough understanding of areas to focus on initially and ensure that the assurance programme is capturing all key risk controls that require to be included in the assurance programme.

This systematic approach is to take the SEMS, and to put in place assurance activities at an appropriate frequency and level and depth for every element of it whilst ensuring that nothing gets missed (and may also help to identify any critical gaps or duplication / conflict in the SEMS). In order to design this, the assurance team should:

- Explicitly list out every business standard/principle, business process, operating procedure or work instruction within its SEMS, at each type of site, and within each function.

- Assess each item identified in the systematic approach according to major accident hazard risk if it is not complied with (based on frequency of activity, what could go wrong, would it be noticed, etc).
- Put in place assurance checks for each activity identified, setting the monitoring frequency/scope/depth in accordance with the output from major accident hazard risk, and also consideration of the factors identified in figure 3. At some (higher) levels of assurance, it may be appropriate to group together sets of processes to be assured in combination.

For established assurance programmes the methodology can also be adapted to include the collective understanding of the health of the 'MAH barriers' and factors such as incident investigation findings, process safety KPIs, etc as outlined in figure 3.

5.3 Identify Perceived Risk

The organisation should define clear organisational arrangements to enable a risk-based approach. The identification of known risks across all elements of the business and the development of a realistic assurance plan is likely to require engagement of a range of people from across the organisation. The formation of a working group focussed on assurance is a good practice to enable the determination of known risk across all elements of the business. The working group would be charged with the responsibility of delivering a realistic and deliverable assurance plan. This has the additional benefit of being an effective way to deliver the required level of engagement at the planning stages. The organisation responsible assurance owner, or Assurance Programme Manager, should manage this dedicated working group. Ideally, the group should consist of a mix of offshore management, Elected Safety Representatives and Technical Authorities/ departments with the relevant knowledge and understanding to determine exposed risk with a curiosity (a sense of chronic unease) to ensure that the assurance plan can respond to organisational weak signals that could manifest into issues in the longer term. The assurance plan should be based on:

- Safety observation card data and trends.
- Root cause analysis, findings and trends from incident investigations, including near misses.
- Engineering/ subject matter expert judgement.
- Process Safety Management KPIs, both leading and lagging, and known process safety barrier health indicators (MAH barrier models).
- Previous audit findings identified through trend analysis.
- Local risk register entries and mitigations.
- Legislation changes/Industry alerts: Step Change in Safety, Energy Institute etc.
- IVB findings.
- Regulatory findings and advice.

5.4 Develop Assurance Scope

Once risk (see figure 3) is understood, an informed assurance scope can be developed.

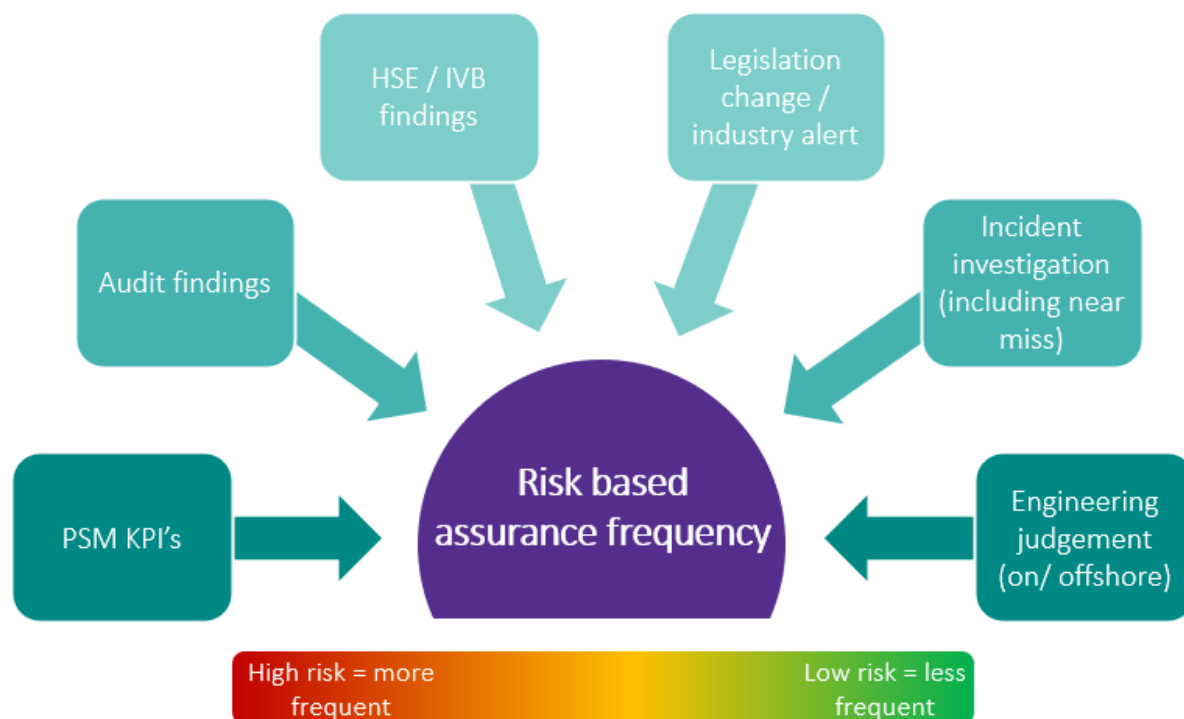


Figure 3: Factors influencing risk identification and frequency setting

This scope should drive the identification of audits to address recognised issues, from both strong and weak signals, to identifying the key risk control systems that prevent a major accident event. Focus, when assessing exposed risk, ought to look to address Major Accident Hazard (MAH) risk and regulatory compliance, as described above. The developed audit scope should enable the organisation to answer the following key questions, at each level:

- Do we understand what can go wrong: the perceived risk picture?
- Do we know what arrangements we have to prevent this happening?
- Do we know what is required by our arrangements?
- Are we confident that our arrangements will work when required?
- Do our arrangements meet all relevant regulatory requirements?

5.5 Determining Frequency

Frequency of assurance activities should be determined by associated risk and level of activity, i.e. asset-based auditing will be more frequent than corporate assurance. They should all, however, feed the growing risk picture.

Initially, a base level of audit frequency, or 'standard frequency' should be determined for each tier. For example, asset-based audits' standard frequency identified as once per quarter, region audits every year

etc and then scale the frequency as the situation dictates: the higher the perceived risk the more frequent the various levels of assurance should be conducted in that particular area.

- Higher perceived risk = high frequency.
- Lower perceived risk = low frequency.

Case Study Part 2 - Review of assurance arrangements

The Company established a task force to explore the shortcomings in the audit, monitoring and review systems and the reasons 'why'. Improvements in the senior leadership team's visibility, overview and assurance of the major accident risk controls was required. The task force identified that:

- The senior leadership team did not request the findings of audits and assurance activities and showed little interest in the outcome. This filtered down the line to the operational and audit teams and audit, monitoring and review was not deemed as an important component of the risk management system.
- Audit plans were being produced annually but these were not risk based.
- There were too many audit activities scheduled for the year. This was seen as a burden to the offshore and onshore support teams. Many actions were raised, which were not risk ranked, and were not closed out due to the lack of accountability for closure and competing priorities.
- The audits conducted were compliance monitoring only – the effectiveness of the risk control systems was not being checked (i.e. how fit for purpose were they?).
- Teams conducting the audits were trained auditors but did not have good understanding of the safety cases or relevant operational experience.

6 Key Roles & Responsibilities

The table below provides an indication of some of the roles and responsibilities that exist within organisations. Depending on the organisation the allocation of responsibilities may differ.

Role	Responsibilities
Board Members (discharged to the CEO/ MD)	<ul style="list-style-type: none"> Has overall accountability for safe operations. Providing sufficient resources and capability to implement an effective assurance programme. Take an active interest in audit results and close out of actions to achieve the desired outcome. Acts on findings and any significant matters to ensure HSE risks, including major accident risks, are adequately controlled.
Operations Director	<ul style="list-style-type: none"> Overall sponsor and approver for the internal audit and assurance programme. Deliver the planned assurance programme. Take an active interest in audit results and ensure actions are resourced to achieve the desired outcome. Provides feedback on significant matters and findings from internal audit and assurance activities to the CEO/board.
Asset Manager	<ul style="list-style-type: none"> Ensuring the asset-based assurance programmes are implemented at those worksites under their control. Make available the resources and facilities to support and encourage the implementation and participation of the asset-based assurance programme. Ensure that the audit plan is supported and adding value. Agreement of audit findings in terms of risk ranking and prioritisation of action. The effective and sustainable implementation of audit actions within their area of responsibility.
Technical Director/ Manager	<ul style="list-style-type: none"> Functional sponsor of those assurance activities delivered by Technical Authorities. Take an active interest in audit results and ensure actions are resourced to achieve the desired outcome. Provision of the appropriate level of technical resource to support the delivery of the assurance programme.

Role	Responsibilities
HSE Director/ Manager – where they are the audit and assurance process owner	<ul style="list-style-type: none"> • Provide feedback on those significant matters and findings within their remit from assurance activities. • Accountable for the co-ordination and implementation of the assurance programme. • Take an active interest in audit results and ensure actions are resourced to achieve the desired outcome. • Overview of risk ranking of audit actions and input to prioritisation of actions aligned to business needs. • Functional sponsor of assurance activities delivered from within the HSE team.
Operations Manager/ OIM/ Onshore Terminal Manager	<ul style="list-style-type: none"> • Support the implementation of the site based and functionally delivered assurance programme for their operational site/installation to add value. • Implement the asset-based assurance and workplace monitoring activities – ensuring an adequate level of coverage across all activities. • Provide feedback on significant measures resulting from the workplace monitoring programme. • The effective and sustainable implementation of audit actions within their area of responsibility. • Share lessons learned.
Risk & Assurance Lead (Assurance Focal Point)	<ul style="list-style-type: none"> • Work in collaboration with the relevant stakeholders to develop an assurance programme, taking into account the risks identified by the business, common themes from assurance activities, common themes from event investigations, industry and regulatory initiatives, etc. • Co-ordinate the delivery of the assurance programme particularly that there are adequate competent resources available and that an appropriate level of resource is available to deliver a complete and thorough audit. • Monitor the effectiveness of the assurance programme including the timely and effective implementation of audit recommendations. • Provide regular feedback to the business on the status of the delivery of the assurance programme and of any significant matters or general issues identified out of the assurance programme.
Lead Auditor – where dedicated audit team exists	<ul style="list-style-type: none"> • Contribute to the planning of the key audit execution process steps: Prepare, Implement and Report. • Provide regular updates on the delivery of the audit – in particular any barriers being encountered.

Role	Responsibilities
Technical Authority/ Subject Matter Expert	<ul style="list-style-type: none">• Lead or support the assurance programme, which may include the development of terms of reference, audit implementation, including assurance that risk control barriers assigned to them are sufficiently robust, audit and assurance delivery and reporting.• Provide feedback to the business on any significant or general issues arising out of assurance activities.• Provide support and input to the development of audit and assurance activities – including the identification of common themes.

7 Corporate and Regional Audit: Execution Process

Corporate and regional audits will mostly comprise of system or technical audits as required by the risk-based assurance plan. Such audits will largely be carried out or led by a trained auditor. The high-level scope of the audit will be defined from the risk-based assurance plan, with a focus on the key assurance questions:

- Do we understand what can go wrong: the perceived risk picture?
- Do we know what arrangements we have to prevent this happening?
- Do we know what is required by our arrangements?
- Are we confident that our arrangements will work when required?
- Do our arrangements meet all relevant regulatory requirements?

The successful completion of such an audit requires detailed planning, preparation and engagement and a structured process for execution and closeout.

7.1 Terms of Reference

Terms of Reference (ToR) should provide a 'route map' for the delivery of the assurance process. It should be supported by engagement with site personnel and have suitable fieldwork conducted to ensure that it targets the key areas. The ToR should consist of at least the following:

- Objective: The objective should relate to the business driver to conduct the assurance activity and what the assurance activity looks to achieve. Ideally, there should be a 'problem' statement or an 'improvement' opportunity identified.
- Scope: The scope should, simply, identify what the assurance activity will include as outlined at section 4.3. But, and as importantly, what isn't going to be included should be identified. Since most assurance activities, despite how well planned and scoped, are organic, in that they tend to grow in scope, it is useful to ensure that the phrase; 'and will not be limited to' is included. This gives the opportunity to broaden the scope of the activity as necessary. Depending on organisational arrangements any reference sources that will be referred to can be included in the scope.
- Fieldwork details: Fieldwork is the general term for those activities that are directly related to the delivery of the assurance activity; this can include the review of documents, discussions and interviews and site visits. At this stage, in the development of the ToR, a view should be taken as to how the fieldwork will be conducted; this must include not only plant and people, but process, too.

7.2 Site Engagement and Kick-off Meeting

7.2.1 Initial engagement with stakeholders

The kick-off meeting is an opportunity to engage with the auditees and to introduce and discuss the terms of reference (although it's anticipated that in the development of the Terms of Reference there will be meaningful engagement with the auditees and subject matter experts). At the kick-off meeting the ToR should only be considered to be in 'draft'.

7.2.2 Development of the ToR

An output of the kick-off meeting is to issue the draft ToR to the attendees of the kick-off meeting for review and comment. While it's important that those delivering any assurance activities are 'independent' (note independent could also be interpreted as internal resource that is detached from the subject of the audit) it is equally important that the auditees are 'bought into' the activity – a technique to achieve this is that auditees are asked to review and comment on the ToR and offered an opportunity to participate in its development. At this early stage, the raising of the awareness of 'weak signals' should be emphasised. Engage the auditees, what are the 'niggles', or recurring issues they have when engaging in the identified audit area etc. it is essential that the coal-face perspective is captured; this will also increase 'buy-in'.

7.2.3 Identification of site activities that could actively contribute to the audit (work-scope being delivered)

A benefit of working with auditees is that 'real time' opportunities to observe site activities can be included in the planning of the fieldwork, e.g. a complex lifting operation, a confined space entry activity or a break of containment. The opportunity to observe 'real time' activities will contribute to the delivery of a better audit and ensure that appropriate people are available in advance of the audit.

7.3 Pre-fieldwork Planning & Preparation

7.3.1 Sampling Strategy

Depending on the subject matter, objective and scope it may be necessary to develop and apply a sampling strategy, e.g. Permits-to-Work, Maintenance Work Orders etc. Generally, sample sizes are determined either by the application of a statistically based formula or through the exercise of professional judgement.

The size of a sample is dependent on a number of factors that can include; the available resources, the time available and the level of sampling risk that is acceptable. The lower the level of acceptable risk the greater the sample size. Additional guidance on sampling can be found in the National Audit Office document *A Practical Guide to Sampling*:

<https://www.nao.org.uk/wp-content/uploads/2001/06/SamplingGuide.pdf>

7.3.2 Office-based Preparation

What can be done in the office by the auditors to be validated on-site: during the planning and preparation stage a key decision to be made is where the best information that supports the objectives and scope can be obtained. It is a far more efficient use of time and resources to identify specific plant, equipment or processes before spending time on-site.

7.3.3 Question sets

Taking the time to prepare question sets is essential to ensure thoroughness, consistency and efficiency. The question set should be balanced with focus across all areas of process safety: plant, process and people. Sharing the question-set may be considered, as pre-seen question sets can also assist those being audited to prepare.

7.3.4 Audit Team

It is important that auditors possess knowledge and an understanding of good practice for the audit and ensure that those performing an audit have the confidence to ask questions as to whether the procedure (as applied) is effective. Do people understand it? Is it working to control the risk? Does it match contemporary good practice?

When designing the audit team there should be clear allocation of roles amongst the audit team and where possible the audit should not be completed by one person. This is dependent on a number of factors, but particularly when having a discussion, the benefits of having 2 auditors present are generally accepted, whilst one auditor is asking questions, a second can record notes and provide an additional perspective.

A mix of skills and experience is an advantage to ensure that the audit does not create a bias in terms of focus in one particular area based upon the auditor's personal preference.

Each audit team should consist of one lead auditor and a minimum of one audit team member. The audit team should collectively have the knowledge and experience to allow them to assess whether the auditee is successfully meeting the requirements of the SEMS. All auditors on a given team should:

- Be familiar with the audit process.
- Have knowledge of the Management System.
- Be independent of the business area being audited.

The audit team may also request the assistance of specialists in order to ensure that the team has adequate knowledge of the operations/processes being audited.

7.4 Engagement

Better quality audits can be achieved when there is an opportunity for the auditees to prepare – it's widely accepted that 'springing' an audit on someone is unlikely to achieve a desirable level of rapport and engagement. A competent auditor should have as an objective the opportunity for auditees to identify good practice as well as taking the opportunity to look for improvement opportunities.

7.4.1 Fieldwork Opening Meeting

Before beginning the on-site fieldwork it is advisable to have a short opening meeting and, where possible, have those who will contribute to the delivery of the audit present. In addition to personal introductions, it is an opportunity to:

- Introduce the audit team.

- Clarify the scope and to make any adjustments to the scheduled activities.
- Provide the opportunity for an auditee presentation (e.g. a brief overview of the business area/ asset, including basic facts, activities, business objectives, challenges and health and safety requirements).
- Agree escorts to accompany the audit team throughout the visit.
- Agree who is to be seen and when with a focus on availability of personnel.
- Agree work activities to observe.
- Agree timescales.
- Discuss post-audit requirements, including reporting, corrective action implementation and follow-up.
- Schedule fieldwork close-out meeting.

7.4.2 Conduct Fieldwork

The fieldwork phase is where the audit team engage with the auditees and obtain evidence of compliance of processes / procedures, identification of non-conformances along with improvement opportunities and good practice. The fieldwork will consist of the following (or a combination of):

- Interviews, conversations and questioning.
- Verification and validation.
- Recording.
- Gathering evidence – ideally from more than a single source.

7.4.3 Daily Briefing Sessions

As required, the audit team shall meet with the designated auditee representative and other interested members of senior management at the close of each day, or at the start of the following day. The purpose of these meetings is for the auditors to provide feedback to the auditee related to what has been observed to date, including a review of potential non-conformances, and for the auditee to provide clarification if necessary. The daily briefing sessions shall be led by the lead auditor. Prior to each session, the audit team shall meet in order to discuss and compare notes/observations and confirm the list of actual and potential major/minor non-conformances to date.

7.4.4 Fieldwork Closing Meeting

Good practice is to conduct a short feedback session at the end of the fieldwork. The key parts of this meeting are to confirm and obtain agreement on what has been identified, provide the site an opportunity to provide feedback. The essence is that when the draft report is issued there should be no surprises. It is important to take the time to communicate general feedback about the audit, including identified strengths and good practices and detail the next steps. Because briefing sessions will be held throughout the audit, the majority of the major findings should have already been communicated to the auditee prior to the closing meeting.

7.4.5 Calibration of Findings

When the assurance activity is conducted across a range of locations, involves several auditors and across a period of time, it is beneficial to review and reflect on the outcome, collate what has been

found and to calibrate those findings – this will assist in determining whether what has been found is specific to the individual site or is a broader systemic issue. This process will also assist in the development of appropriately targeted actions.

7.4.6 Draft Report

This report should be short, to the point, factual and (for the site/s) contain no surprises. A draft report should be issued approximately 7 days before the closing meeting to allow the business to digest what has been identified and begin to consider what remedial actions might be appropriate. The report should have a clear summary that succinctly covers the findings or concerns as well as highlighting good practice. The report should avoid being a full download of all the notes taken during the audit and be structured in a way that adds value to the reader with the ability to quickly identify the important points.

7.4.7 Closing Meeting

The closing meeting is an opportunity for the auditors and the business (or part of the business) to agree the draft report and where findings are prioritised – to agree the prioritisation.

7.4.8 Agreement of actions

In discussion between the audit team and the business (or part of the business) a series of actions should be identified and agreed. It is important to remember that it may be more appropriate to have a number of actions associated with a specific finding. The approach should be to develop an action that is both SMART (specific, measurable, achievable, realistic, time bound) and sustainable. The risk associated with the finding and subsequent action should align to ensure the correct prioritisation of the action. There can be a tendency to dilute actions or wordsmith them to reduce the impact of the finding, this should be avoided and the fact that an improvement opportunity has been found should be seen as a positive. Conversely when agreeing actions the practice of generating too many action should be avoided and focus on SMART actions that will make a sustainable difference to address the finding.

Humans are a weak barrier and can make errors (mistakes, slips, lapses) or violations (both intentional and unintentional). This can be for a variety of reasons including inadequate procedures e.g. they are wrong or difficult to follow. When audits consistently identify few corrective actions, it should be a concern. A lack of audit actions should be challenged in them manner that we should ensure that corrective actions address the root cause of the finding and not merely the symptoms. The suitability of the actions should be reviewed and confirmed, before they are assigned.

7.4.9 Distribution of the final report

Any agreed feedback from the closing meeting should be incorporated into the audit report before the final agreed report and actions are distributed to all stakeholders. In some organisations bad news isn't well received, however it is important that senior leaders get to see the real picture of how their management systems are performing to allow them to be informed when making right decisions and provide suitable level of resources to address weaknesses. Some audit findings are so significant (or occur so frequently) that they should be reported to management board level. Good assurance systems

should mandate this, with examples to support what is expected in terms of items to escalate and to whom.

7.4.10 Agreed Actions

Agreed actions should be recorded and tracked in the business action management system with clear owners and expected closure dates based on risk profile that is determined by the audit team and agreed by the auditees that they are SMART (specific, measurable, achievable, realistic, time bound).

7.4.11 Lessons Learned

It is likely that a broader range of people than those who will receive and read the final report will need to know the findings. To aid communications and enhance the learnings lessons identified slides can be prepared and broadly distributed. Depending on the business and the audience it may be advantageous to produce slides with an operational perspective for general distribution and a separate slide set through a strategic lens for senior managers.

7.4.12 Reflective Session

On completion of the audit, good practice is for the audit team to meet and review what went well and where there were opportunities for improvement at all stages of the audit.

8 Asset Level Compliance Monitoring Audit

8.1 Programming

All asset level audits should be programmed centrally, by the Assurance Programme Manager, in line with the risk-based audit schedule. Ideally, there should be scope for the asset/ site manager to influence programming to reflect their perceived risk and knowledge of the asset. The asset level audits should be forecast out for 12 months to provide a cohesive assurance coverage.

8.2 Type of Audit

Asset level audits are compliance audits with specific, pre-set question sets. They should comprise open, as opposed to closed, questions to assist investigation, enquiry and discovery on the side of the auditor and those being audited. Ideally these audits will be based in an assurance management system to allow for action tracking and progress monitoring.

8.3 Audit Team

Auditors will comprise of asset supervision, so although there is no need for qualified auditors due to the scripted audit question sets they should have some form of audit and action generation awareness training. As site-based personnel, they should be made aware of the need to capture weak signal, or low-level observations to enable scrutiny across all assets and identify common trends. Auditors should be assigned on a weekly basis by the site manager.

9 Workplace Monitoring

Asset Managers/ Site Managers are responsible for ensuring the delivery of workplace monitoring programme. At an asset/ site level these assurance activities must be planned (to align with work activities), delivered by competent people and be arranged to enable the asset/site to provide periodic updates that include any significant findings, trends or other matters of concern. There is an expectation that workplace monitoring activity will be one of the sources of input during the development of the wider assurance plan.

In developing the workplace monitoring programme, account should be taken of process safety, occupational health & safety and environmental management systems. For both consistency and simplicity, it is beneficial to prepare a series of topic specific question sets and to construct those in a way that allows for scoring and the application of some statistical analysis to develop a basic understanding of the cumulative impact of findings.

The most specific similarity between workplace monitoring and the behavioural safety programme are the questioning and listening skills. However, the primary difference is that while the behavioural safety programme is built around unplanned opportunities the workplace monitoring programme is built around planned interventions.

- Workplace monitoring activities should focus on the effectiveness of the SEMS in relation to control measures that are being impacted via a specific task. Topics could include but are not limited to those listed below with an example of a monitoring schedule shown in table 1.
- Permit to Work.
- Isolation Management.
- Operational Risk Assessments (application of controls).
- Overriding Safeguarding Systems.
- Vessel Operations.
- Lifting & Hoisting Operations.
- Tool-Box Talks.
- Control of High Energy Hot Work.
- Control of Work at Height.

Area	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Permit to Work	Tom			Bob		Ahmad	Claire	
Isolations		Claire	Tom			Bob		Ahmad
Lifting Operations	Ahmad			Claire	Tom			Bob
High Energy Hot Work		Bob	Ahmad		Claire		Tom	

Table 1 - Example of workplace monitoring schedule

In terms of good practice of carrying out an assessment of the physical barriers involved in an operational process an approach to consider is to undertake a sample inspection. This can be used to determine condition via the observation of a process activity by assessment of layout and escalation /emergency controls. The approach focuses covers typical areas of control such as:

- Control system overrides.
- Locked and normally closed/open valves.
- Pipes, flanges and blinds.
- Excess flow depressurising valves.
- Small bore fittings (<2").
- Relief valves and rupture discs.
- Closed/Open drains.
- Field instruments.
- Pressure vessels.
- Rotary equipment.
- Chemical storage and usage.
- Emergency equipment.
- Electrical control.
- HP/LP interfaces

The findings from workplace monitoring can allow for the identification of weak signals in such areas as compliance with procedures, or implementation of mitigations in relation to life saving rules, such as use of barriers for lifting activities. The assurance process should allow these weak signals to feed directly into corporate and regional audits to ensure that lessons identified can be learnt across an organisation.

Case Study Part 3 – Actions taken to improve assurance

The previously established task force brought in an industry investigation expert to meet with the senior leadership team to outline the importance of audit, monitoring and review in the risk management framework. The industry expert had been part of an investigation team of a large-scale process incident that resulted in injuries to a number of the workforce, with significant business impact. Because of the direct experience, the leadership team responded well and implemented the following actions:

- Established an audit review committee that reported to the leadership team on a monthly basis.
- Made changes to personnel and moved an operations manager into position to lead the audit team. The reasons for this were two-fold: bring operational experience into the audit team and send a clear message to the organisation the importance of audit, monitoring and review in the risk management framework.
- Expanded the audit team with the addition of an experienced process safety engineer.
- Established a leading KPI relating to assurance, presented and reviewed frequently by the Board of Directors.

On the back of a clear mandate by the leadership team, the audit team:

- Developed a risk-based assurance plan using the safety case as reference and the key installation risks.
- Established a multi-disciplinary team to undertake the audits. The team were allocated sufficient time to prepare, execute and follow up.
- Met monthly to review the activities and findings to explore if the findings were installation specific or common shortcomings in the management system and to share learnings.
- Reviewed the findings to identify individual and systemic underlying causes that when considered cumulatively raise the priority of the action required.

10 What to check

One of the purposes of assurance is to ensure that the workforce and management are aware of the state of health of the Safety & Environmental Management System (SEMS), and the barriers in place to mitigate Major Accident Hazards. This allows key areas of improvements to be identified and acted upon.

Key statements to be considered during the assurance are:

- How well are our assurance processes working?
 - Are we meeting our monitoring/assurance/audit plans at all levels?
 - Are the completed audit activities providing good quality output? Are we identifying true weaknesses, or has the exercise become a tick-box exercise?
 - Are identified issues analysed to identify root cause?
 - Is there sufficient coverage across the four different types of audit (System, Technical, Compliance, Regulatory)?
 - Does the assurance plan sufficiently cover all audit and monitoring activities for the robust verification of activities in relation to people, plant and process? It is important to be sure that sufficient audit/monitoring takes place across all three elements.
- What is the status of our barriers against Major Accident Hazards, and which areas of our SEMS need further focus?
 - It is useful to put in place a formal system for reporting to the various levels of management.
 - At a local (installation) level, it is important that supervisors and the workforce are aware of any weaknesses, so that these issues can be resolved in a timely manner. This may be achieved through close-out meetings following an audit.
 - For Senior Management, it is useful to provide summary reports indicating adherence to audit schedules, key risks identified, action status, and any trends/KPIs indicating the health of the SEMS.
 - The key here is that at any given time, key risk areas are known at all levels, are mitigated and tracked to closure.
- Are we making improvements?
 - Is the balance correct between finding problems and fixing problems?
 - Whilst this may seem obvious, a common pitfall is to complete audit and monitoring activities on time, yet allow improvement actions to fall into backlog.
- Are we sharing good practice?
 - Auditing can identify areas of weakness, but can be very useful in identifying existing good practice. This good practice should be recognised and spread.
- What information is available in order to steer future monitoring and audit plans?
 - Regulatory findings and incident statistics may be signals that more audit/monitoring focus is required on certain areas of the SEMS.
 - Are there significant activities or changes planned which could test the effectiveness of the SEMS? Is there an opportunity to audit this area in advance to ensure success?
 - Are there weak signals in the process that require to be acted upon or followed up to align with other sources such as investigation reports?

11 Acting upon Assurance Findings

Acting upon the findings of assurance activities, whether corporate or workplace, is arguably the most difficult aspect of assurance. Reasons for this include:

- Different perceptions of those being audited.
- Too many findings that are difficult to action because of volume.
- Unclear grading of findings that makes it difficult to prioritise.
- Unclear or un-specified recommendations and open-ended actions.

From a calibration perspective it should be emphasised that the auditor has found an opportunity to improve with an emphasis on ensuring effective & agreed actions that close the gap from the finding and improve HSE performance. It also ensures that leadership are aware of significant gaps and support their resolution in a positive manner.

There could also be a resistance to listen to a finding around a weak signal since these require greater scrutiny to understand them and also some level of skill from the auditor to identify and the auditee to understand the impact of the weak signal materialising to a consequence such as hydrocarbon release. A weak signal in relation to the SEMS not functioning effectively can map across to the health of the MAH barriers and as such should be acted upon in a manner that promotes a development of an action from this finding.

Once a finding has been identified the next challenge is to ensure actions are suitable and sufficient to address the gaps in a sustainable manner. Via a risk based approach actions can be developed that ensure that the finding is not diluted via either a weak action that does not address the finding or by changing the action wording to dilute the impact it will have on those reading the assurance report. By generating a culture of welcoming 'bad news' there will be less of a tendency to try to reword findings and the actions will be more focussed on preventing recurrence.

Repeat findings should be dealt with in a manner that draws attention the fact that they have occurred more than once and as such the previous action was not suitable nor sufficient.

Throughout the assurance framework there will be multiple data sources that provide the opportunity to identify single issues and generate actions accordingly. The real challenge is to bring these findings together in a manner that provides a cumulative view of the assurance findings across the various levels. For example, a weak signal that is picked up at compliance monitoring around lack of compliance on completing a flange management register should look at the underlying causes that generate this non-compliance. These underlying causes could be; competence levels, cultural aspects, human factor/performance (workload, fatigue), poorly written procedure and/ or lack of leadership oversight. The underlying causes can be added to the overarching audit programme to ensure that the underlying causes have not been replicated across other areas. The approach of identifying underlying causes from weak signals should ensure that the apparently less significant audit findings across a number of areas can be identified as a fundamental failing that requires addressing with increased priority and resources.

The assurance framework should be dynamic between the various levels of audit/ monitoring to ensure that workplace repeat weak signals can be fed upwards to the audit scope and conversely the audit issue around compliance can be used to modify workplace monitoring focus via revised questions to drive improvement.

12 Assurance Program Review

Throughout this guideline the aspects of assurance have been outlined, however it is important that the actual assurance program itself is reviewed in entirety to ascertain that it is fit for purpose in terms of delivery of the programme and assurance. The recommended good practice for this is to have a team review, ideally annually, the assurance program independently. This review should look at:

- Assurance programme structure – does it address the key MAH threats across all business areas?
- Risk based approach – is the assurance program being driven by a suitable ranking of risks. Is this ranking reviewed and updated periodically and is all relevant information being taken into account in this ranking?
- Audit types – does the assurance programme look at the four types of audit articulated in this guideline; system, technical, compliance, regulatory?
- Audit team composition – are the audits being conducted by one point of contact or spread across the business to incorporate subject matter experts? Consideration should also be given to full time commitment to an audit versus part time whilst balancing day to day workload.
- Assurance programme delivery – are audits being completed on time and with sufficient space in the plan to allow them to be conducted in a thorough manner? (Note: check for audits that have moved due to other activities that have been deemed as a higher priority)
- Audit report findings – are the reports being read and discussed at the correct level in the organisation and in what manner are findings received?
- Audit report actions – are actions being completed on time and in a sustainable manner? (Note: annual sample check of actions across the assurance programme is recommend in terms of close out statement)
- Underlying causes – does the assurance programme review underlying causes that may have a low individual risk when considered in isolation, yet when considered across the audit findings highlight a developing weakness in the SEMS?
- Key performance indicators (KPI) - Requirement and subsequent development of KPI in relation to the measuring, monitoring and managing performance aspects across the assurance programme; suggestions could include:
 - Number of audits complete against the original plan.
 - Number of audits that have had their date amended and the reason why.
 - Audit finding themes across the assurance programme.
 - Audit actions that have been closed out on time.

13 Summary

Effective assurance is a key component of the risk management framework to manage safety and environmental risk. Assurance provides confidence that risk control systems are effective and to identify weak signals that may escalate into an event. Assurance if implemented correctly at the various levels throughout an organisation can positively engage the workforce and positively contribute to the strength of the prevent barrier. Effective assurance is a key component of a healthy safety management system that will reduce the risk of major accident pre-cursors events materialising, such as hydrocarbon releases, and safety and environmental events.

It is important to link back to the Principles of Process Safety Leadership for the offshore UKCS Oil & Gas industry to reflect on the collective responsibilities from the CEO to the apprentice technician.

- Process safety leadership requires senior leadership **team involvement**, understanding and competence.
- Good process safety management requires constant **active engagement and vigilance**.
- **Robust and regular auditing** of the safety management system and associated major accident hazard barriers, is essential to ensure that system weaknesses are identified and process safety risks are being effectively managed.
- **Publication** of process safety performance information provides important assurance about the management of risks by an organisation.
- **Sharing good practice** across industry sectors in order to learn and implement lessons from relevant incidents occurring internally and externally to the organisation, is important to maintain the currency of corporate knowledge and competence.

In conclusion the good practices can be summarised as:

- Structure via an assurance plan linking the various levels.
- Risk based selection that considers systems in addition to weak signals, underlying causes and previous trends.
- Clear and agreed terms of reference.
- Blended approach with a multi discipline team.
- Quality assurance activities and actions-based quality as opposed to quantity.
- Development of KPIs to provide visibility to leadership.
- Assurance review committee to look at trends and sustainability of actions.
- A culture of welcoming 'bad news' that allow for improvements.

Case Study Part 4 – The outcome

Despite the initial reluctance to change and move the mind-set to audit being a 'good' operational task, the changes to the audit, monitoring and review arrangements were successful:

- Increased accountability by the senior leadership team, and down the lines, to develop and execute risk-based assurance.
- An improved safety culture across the organisation – the leadership team set the example of looking closely at itself and learning, which filtered through the organisation.
- Gave a more holistic overview of the effectiveness of the risk control systems and risk areas;
- Reduced the number of authority inspection findings.
- Gained increased trust and confidence from the regulators - less planned authority inspections which gave the Company time to implement and sustain the improvements.
- Reduction in HCRs primarily related to changing the inspection and maintenance arrangements for small bore tubing. However, the risk-based assurance that was done on other hydrocarbon systems reduced the risk of future hydrocarbon releases.

14 Governance

In order to ensure compliance of Management Systems (including Safety & Environmental Management System (SEMS)) an organisation should demonstrate clearly that defined legislation and governance has been met. Assurance regimes should meet the following legislation and governance:

- Health and Safety at Work Act 1974 (HSAWA) Regulation 2(1) and 3(1). Employers are to ensure, so far as is reasonably practicable, the health, safety and welfare at work of all their employees. This establishes the general duty of which audit, monitoring and review are reasonably practicable activities in the discharge of that duty.
- The Offshore Installations (Offshore Safety Directive) (Safety Case etc) Regulations 2015 (SCR15) Regulation 7(6)(b). Regarding the CMAPP, a duty holder must set up appropriate monitoring arrangements to ensure effectiveness of the policy.
- SCR15 Regulation 16 (1)(b) and (3). Audit arrangements are specifically required to assess the adequacy of a duty holder's management system to ensure compliance with relevant statutory provisions and that the management of arrangements with contractors and subcontractors is satisfactory.
- SCR15 Regulation 27 (d), (e). This regulation requires a written statement covering key aspects of audit reports to be kept (available) on the installation. This should cover the main findings of the audit report, recommendations, proposed actions and timescales and actions taken.
- SCR15 Schedule 1(7). This schedule (together with the associated guidance in paragraph 364) require periodic audits undertaken by competent personnel, the establishing of arrangements to capture audit findings and the implementation of measures to feed back to relevant parties and adopt means to ensure outstanding actions are closed out. The arrangements should ensure significant matters will be raised to management board level, including audit close-out backlogs, which may impact on the organisation's ability to manage and control major accident hazards.
- SCR15 Schedule 2(4). This schedule requires a suitable framework for monitoring compliance with all relevant statutory provisions by incorporating statutory duties into standard operating procedures for major hazards control and environmental protection.
- SCR15 Schedule 3(8). This schedule, and the associated guidance in paragraph 386, require adequate arrangements for both active and reactive monitoring of health, safety and environmental performance, particularly in relation to major accidents. This should also include reviews of resultant findings to ensure appropriate changes are made.
- SCR15 Schedule 3(9). This schedule, together with the associated guidance in paragraphs 388 and 389, require delineation of the organisation's audit programme, the range of audits and how topics for audit are selected. It requires assurance of the competence of those carrying out audits and how audit programmes are monitored to ensure they remain effective.
- SCR15 Schedule 6(5). This schedule, together with the associated guidance in paragraph 436, require monitoring arrangements and audit practices to ensure the SEMS are current and suitable.
- SCR15 Schedule 11. This schedule, together with Regulation 32 (4), require duty holders to establish priorities, standards and guidance in order to prevent major accidents and the limit their consequences. Audit, monitoring and review activities are a primary means of generating information from which to base these priorities, standards and guidance on.

- Management of Health and Safety at Work Regulations 1999 (MHSW) Regulation 5. This requires appropriate arrangements for the effective monitoring and review of preventive and protective measures.
- HSG65. This guidance focuses on monitoring in the context of checking and measuring performance.
- HSG254. Under the term 'monitoring', this guidance brings together formal audits, process safety performance indicators and workplace monitoring activities. This covers the gathering of data over the spectrum from low frequency, in depth information to high frequency, lower depth information.
- Energy Institute Process Safety Management Framework – Element 20: Audit, assurance, management review and intervention. This provides comprehensive 'how to' guidance covering setting performance measures for workplace monitoring through to establishing a range of audits which integrate the various levels of activity and information. It covers good practice processes for audit, assurance, management review and intervention.

15 Further Guidance

[Energy Institute PSM framework](#)

[CCPS 20 elements/red book \(risk-based process safety\)](#)

[National Audit Office - A practical guide to sampling](#)

[Self-Verification - A Good Practice Approach video](#) Note: the “video” has been provided by BP to OGUK for illustrative purposes only and is not to be relied upon by OGUK or any other party. All rights, including, without limitation, copyrights, patents and other intellectual property in the video and/or associated with any ideas, concepts, techniques and/or processes within the video remain with BP.



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