Hydrocarbon Release Reduction TOOLKIT

Human Factors
Hydrocarbon Release Database
Bolted Joints Guidelines
Flexible Hose Guidelines
Small Bore Tubing Guidelines
Vibration Guidelines
Corrosion Management Guidelines
Awareness and Communication Audit
Hydrocarbon Release Reduction TOOLKIT

CONTENTS

02 Introduction
04 Tool 1 Human Factors in Hydrocarbon Releases
06 Tool 2 Hydrocarbon Release Database
08 Tool 3 Good Practice Guidance
08 a Bolted Joints Guidelines
09 b Flexible Hose Guidelines
11 c Small Bore Tubing Guidelines
12 d Vibration Guidelines
13 e Corrosion Management Guidelines
15 Tool 4 Awareness and Communication
17 Tool 5 Audit
20 Tool 6 References and Contacts
Installation asset integrity is one of the main areas of focus by the offshore oil and gas industry in its efforts to prevent the occurrence of a major accident event, to ensure long term security of oil and gas supplies and to continue its significant contribution to the UK economy.

Hydrocarbon releases are one of the key performance indicators of an installation’s asset integrity performance. Although major inroads have been made in reducing major and significant releases in recent years, the improving trend slowed in 2006/07 and 2007/08 suggesting the need for renewed awareness and efforts.

At the time of publication the latest data, as seen in the graph below, shows there were 61 major and significant releases in the reporting year 2008/09. This is a significant improvement over the previous two years, but the imperative for sustained efforts to secure lasting leak reduction remains.

For more details on severity classifications see the HSE Hydrocarbon Releases Data web site www.hse.gov.uk/hcr3/
The current level of major and significant releases represents an over 50% improvement in the last 10 years. However, the HSE has agreed a new target with the industry of 62 major and significant releases to be reached by 2010/11. This represents a 45% improvement based on 113 major and significant releases in 2001/02.

Improving asset integrity performance by preventing all hydrocarbon releases should be a primary goal for all installation operators. This can only be achieved with an effective management system that targets the causes of releases and implements, in a sustainable manner, proactive measures such as the good practices identified in this Toolkit.

The Step Change in Safety Leadership Team commends this revised Hydrocarbon Release Reduction Toolkit to all those responsible for the management and operation of hydrocarbon process systems. A full commitment to the good practices identified within will make a significant contribution to HSE and Industry targets and to the UK Offshore Oil & Gas Industry’s vision of being the safest offshore oil and gas region in the world.

Although the Toolkit is focused primarily on equipment failures, hydrocarbon release data indicates that a high percentage of releases is due entirely or in part to human intervention. Typically these failures are in permits to work & isolation procedures, task risk assessments, training & competency, planning & communication. The ‘tools’ for addressing these areas are already well established in offshore operations. However for all ‘tools’ to be effective they must be regularly inspected and well maintained.

Further information on permit to work systems and isolation procedures can be found on the HSE’s website. Further information or guidance on Task Risk Assessment can be found on the Step Change in Safety website.
Industry and the Health and Safety Executive in the North Sea estimate that 50-70% of hydrocarbon releases have causes linked in part or in whole to Human Factors. In simple terms this suggests that a large proportion of releases are not due to “spontaneous” failures of equipment, but to things people do (or don’t do) when designing, maintaining and operating. How might you start understanding and managing these issues?

The approach typically used in understanding leak causes is to identify the plant items that are most commonly associated with leaks. This in itself helps to identify some HF contributions. For instance, small bore tubing is a regular source of leaks. It requires trained and competent personnel who understand the stresses and vibration issues that can be created by incorrect fitting. However, other types of failure may not be identified by this plant-focused perspective. Asking “What were people doing that led to the leak?” gives a different picture of systemic causes. For instance, this may point to design, isolation, or maintenance of plant. This approach allows you to focus in on the particular operational tasks that may need improving through redesign or good management. You may find that there are a number of deeper rooted problems with existing operational practices that simply manifest themselves as a leak.

When it comes to understanding the human contribution to an accident we often don’t delve deep enough into the causes. “Human error” and “Not following procedures” are often cited as root causes of a leak, but these events often have deeper rooted explanations which must be systematically addressed. People’s behaviour can be broadly divided into intentional and unintentional. If intentional, the challenge is to understand what the motivation of the individual was. This may include the prospect of reward, saving time or approval of peers or managers, or irrational belief that they are in control or know better. If unintentional, the action was probably an error of some type. Good management of those things that make errors more likely (complexity, time pressure, fatigue) can reduce the probability of error.

Several investigation systems now offer the ability to drill down to establish the circumstances in which a particular behaviour occurred. However, even in the absence of these, a good investigator can make a difference by not being content with the answer “human error” or “not following procedure”. Continue to ask “why did this error occur” and “why wasn’t the procedure followed” until you reach the real root causes. Keep asking ‘why’, ‘what’ or ‘when’ questions until there are no more questions to ask. In many cases, having identified the root problem, the solutions will be well within the scope of normal good design and operating practice such as engineering, supervision, checking and permit to work.
There is also a positive side to human involvement - particularly in the detection of leaks. HSE research suggests automatic systems detect only a proportion of all leaks. Although this may be partly due to the unreliability of detection systems the fact remains that people detect one-third of Major leaks (by HSE OIR/12 definitions) and two-thirds of Significant releases. Data is not available for Minor releases but extrapolation would suggest that the best detection for these leaks is human.

Moving from a position where a company is not managing its leaks to one where it is mindful of the consequences and actively eliminating causes may require a culture change. This may mean a wholesale realignment of the values, priorities and knowledge base of the company, or simply a refocusing of attention onto this important issue. One possible approach to cultural change is to ensure that your plans include:

- **Management commitment**: Leadership needs to visibly demonstrate that the reduction of leaks is an important goal for them.

- **Communication**: It is necessary to communicate this leadership commitment, the current performance and the risk associated with leaks. It's also important to tell people about the measures that need to be taken.

- **Participation**: The intervention needs to include all teams that have an influence on leak prevention and detection.

- **Competence**: People need to have the right knowledge and skills through training and practice.

**The consequences for an HF leaks strategy are:**

- Distinguish between intentional and unintentional acts.

- Having understood the root causes, use good design and operating practices before looking for more complex solutions.

- Have a systematic policy of searching for leaks and consider area-ownership schemes.

- Regularly check recently broken or disturbed joints and reinstated equipment when recommissioning.

- You may have to change the culture of the company to make it mindful of the importance of hydrocarbon leak reduction.

**RESOURCES:**

- “Reducing Error and influencing behaviour”, HSG48, HSE Books 1999

- Offshore information sheet 2/2009 “Hydrocarbon Releases (HCRs) Offshore”


The Hydrocarbon Release (HCR) System contains detailed voluntary information on offshore hydrocarbon release incidents. The web-based version of the HCR System allows duty holders to have password-protected access to the system to submit incident reports direct to HSE via online interactive forms. Statistical information is also made available to duty holders and other authorised users in the form of a data download facility, standard reports, generated graphs and/or tables online as required.

Interrogation of the database allows companies to gain valuable trending information for their own facilities as well as being able to assess their performance compared to the rest of the industry. This can be invaluable for setting up inspection programmes as part of the integrity management system and also establishing an audit programme.

Some examples of the kinds of trending you can extract from the database are: system failures resulting in HCRs; equipment failures resulting in HCRs; types of failure and leak frequencies for each system.

How do I access the HCR System?

The HCR System HOME page at https://www.hse.gov.uk/hcr3/ contains general details of the site, including a table and graph, which illustrate current reporting trends, plus a HELP file describing the various features of the HCR System. After logging on, this HELP file expands to include full guidance on how to report releases and how to operate the HCR System.

If your company has not yet registered to use the HCR System and, after viewing the HCR HOME page information, you feel that you could benefit from further information on offshore hydrocarbon releases, then please use the contact details given on the HOME page and in HELP to advise the HCR Administration team of your requirements.
For all reportable releases Form OIR/9B must be completed and submitted within 10 days. This should be followed by Form OIR/12 Supplementary Information submitted within 28 days. HSE Operations Notice 30, available on the HSE website, contains details on correct submission of Forms OIR/9B and OIR/12.

(Note: Form OIR/12 cannot be processed by the HSE without Form OIR/9B having been submitted. If an HCR is subsequently deemed to be non-reportable under RIDDOR 95, then the Form OIR/9B should be withdrawn.)

Links to other free online Hydrocarbon Releases documentation are as follows:

  (Note that this is the last such report to have been produced by the HSE. After this time, the data download facility available via the HCR System allows users to produce their own HCR statistics.)

- HSE formal guidance for Reporting of Offshore Hydrocarbon Releases: www.hse.gov.uk/research/otohtm/1996/index.htm#100+ (Scroll to report number 96:956, click and wait for .pdf file to load)

- Oil & Gas UK supplementary guidance for Reporting Hydrocarbon Releases: www.oilandgas.org.uk/issues/health/hydrocarbonreleases.cfm
Introduction

This is a collection of good practice guidelines developed by the oil and gas industry to address the main leak areas identified from the Hydrocarbon Release Database.

Tool 3 Good Practice Guidance

a Bolted Joints Guidelines
b Flexible Hose Guidelines
c Small Bore Tubing Guidelines
d Vibration Guidelines
e Corrosion Management Guidelines

A bolted joint is one of many safety critical components of a pressurised system. Dependent upon the contents and pressure of the system, leakage or failure of a bolted joint can have potentially catastrophic consequences. To meet this challenge, every operator of pressurised systems should have in place a system to positively and actively manage the integrity of bolted joints. It is expected that such a system will be built around the principle of continuous improvement (see Figure 1.1).

The Oil & Gas UK/Energy Institute Guidelines for the Management of Integrity of Bolted Pipe Joints for Pressurised Systems 2nd Edition (June 2007) describes the principles and good practice for the establishment of a management system for bolted joints in pressurised systems. The individual sections provide details of what is considered good practice in the key areas of ensuring joint integrity. Together they provide the framework for a management system.

The publication is not intended as a design guide for bolted joints, but as a guide on how to manage joints during construction and commissioning phases and through their operational life. It provides a framework to achieve this based on working with a correctly designed joint.
Flexible Hose Assemblies (FHAs) are complex components used extensively for delivery of products or hydraulic power on a wide range of process, drilling and service/utility systems. Failures in their integrity can create hazards such as leakage of flammable or toxic substances. Failures or defects can compromise the operation of safety and control systems, impact on the safety of personnel or cause environmental problems.

FHAs are often an integral part of pressurised systems carrying hydrocarbons (liquids and gases), high-pressure water, chemicals, fuels and high-pressure power fluids. They are also used in many drilling/well engineering applications and extensively used during bulk loading and unloading operations.

Effective management, in particular the assurance of personnel competency and hazard awareness, is key to ensuring the quality of the whole lifecycle management of FHAs. To ensure the integrity of flexible hose products, it is necessary to establish performance-based maintenance and inspection strategies in accordance with approved guidelines and inspection practices.

The UKOOA/IP Flexible Hose Management Guidelines address many of the good practice issues concerning design, installation, maintenance, inspection and testing of hoses in all possible applications. They also cover required skill levels, training and overall competency of personnel.
## Flexible Hose Assembly

Safety Management Lifecycle Objectives and Activities table, Issue No.1 – Jan 2003
This table has been extracted from the UKOOA/IP guidelines:

<table>
<thead>
<tr>
<th>Lifecycle Phase</th>
<th>Objectives/Deliverables</th>
<th>Activities</th>
<th>Documents</th>
</tr>
</thead>
</table>
| Conceptual Design                      | To ensure that the use of a flexible hose assembly can be justified as the optimum technically safe solution, and that all lifecycle aspects are considered. | • Safety assessment  
• Technical evaluation  
• Lifecycle cost analysis  
• Identification of alternative methods | These Guidelines  
ISO 8331 |
| Risk Analysis                          | To identify and evaluate any risk posed by the use of FHAs in any specific application, classify the FHAs by risk category, and to ensure that risk reduction measures have been fully considered. | • Risk assessment  
• Identification of Opportunities for risk reduction | These Guidelines |
| Detailed Design                        | Detailed design, materials specification, operating conditions, procurement and storage. | • Hose performance  
• Compatibility  
• Operating parameters  
• Procurement criteria  
• Certification | These Guidelines  
ISO 8331 |
| Construction /Installation /Commissioning | To ensure that FHAs are transported, sorted, installed to design, and that commissioning is satisfactorily completed. | • Installation and testing  
• Storage and transportation  
• Hose routing  
• Commissioning | These Guidelines  
ISO 8331 |
| Operations, Maintenance, Inspection and Testing | Development of a Maintenance and Inspection Strategy for FHAs. The strategy should ensure that inspection frequencies align with the FHAs’ Criticality and Risk Assessment. | • Tagging and documentation  
• Inspection strategy  
• Pressure testing  
• Rejection criteria | These Guidelines |
| Modification                           | To ensure that the integrity of FHAs is retained, both during and after modification or charge of service conditions. | • Risk analysis  
• Detailed design  
• Change management | These Guidelines  
All of the above |
| Decommissioning                        | The integrity of the FHAs is retained during decommissioning. | • Risk analysis  
• Decommissioning /Removal  
• Change management  
• Documentation and closeout | These Guidelines |
Small bore tubing systems are a significant contributor to the incidence of process containment failure in hazardous plants. When incorrectly designed, selected, modified, installed or maintained, small bore tubing systems will inevitably degrade and can rupture catastrophically leading potentially to large hydrocarbon releases.

The purpose of the *Guidelines For The Management, Design, Installation and Maintenance of Small Bore Tubing Systems* is to provide operators of offshore installations and onshore plant with a reference framework of management and technical controls and procedures necessary to ensure the continuing integrity of small bore tubing systems.

The guidelines apply to small bore tubing used for instrumentation and control purposes. They provide an outline approach to the specification, design, operation and maintenance of small bore tubing installations and set out issues to be considered and recommended principles to be followed:

- Principles of hazard management should be integral to the design, maintenance and operation of small bore tubing. Root cause analysis of failures is essential and any lessons learned should be fed back into the management of these systems.

- A management system should be established to ensure competency of personnel and identify the requirement for a register of ‘Authorised Personnel’. An e-learning course, ‘Compression Fittings and Small Bore Tubing Awareness’, has been developed as a result of a Joint Industry Project to deliver the awareness training requirements of these guidelines.

- Performance standards and their typical content should be considered, if a hazardous situation could arise as a result of fittings failures.

- Requirements for setting up a standardisation policy to specify the permitted combinations of fittings and related devices for use when considering a new installation or altering an existing installation site.

- The principles of making up various fittings.

- Maintenance and operations, including the need to ensure that any changes to the systems do not adversely affect the small bore tubing.

- Field installation covers the installation aspects of some of the most commonly encountered components.

The control and standardisation of fittings, tube types and brands on individual installations and plants are essential to reduce the incidence of defective work. A policy for the technical management and minimisation of the valve, fitting and tubing types should be developed, documented and implemented for each new or existing installation or plant.

The policy should be made visible to, and understood by, all personnel involved in the design, installation, commissioning, maintenance, operation and purchasing of small bore tubing systems and equipment.
Fatigue failure from vibration in pipework is a common source of leaks. Vibration causes dynamic stresses which, if above a critical level, could initiate fatigue cracks. Fatigue cracking can lead to through-thickness fracture and subsequent rupture. Fatigue life of the component can be relatively short (minutes or days) or long (years) if the vibration is intermittent.

Three of the vibration related problem areas addressed by the offshore industry are: continuous vibration from steady-state plant operation (the commonest); transient vibration (shock/impact loading from rapid valve closure etc.); and vibration in flexible risers from subsea lines.

1 Continuous Vibration

Guidelines for the Avoidance of Vibration Induced Fatigue in Process Pipework, were produced by the Marine Technology Directorate (MTD). They address:

a Different vibration mechanisms and their effect on pipework and small bore connections (SBCs)
b Assessment methodology for the likelihood of failure of piping systems and SBCs for the various excitation mechanisms
c Possible design solutions/best practices for piping systems or SBCs susceptible to vibration
d Survey methods for vibration measurement and assessment of pipework fatigue in operating plant

Key Areas:

Identification
Good awareness programmes enable the workforce to identify and record potential threats from vibration. Anomaly reports detail which system has been affected and under what conditions this problem was observed.

Assessment
Risk assessment should be applied to all main lines and SBCs, ensuring all types of excitation are considered. The risk associated with the whole plant under different operating conditions should also be assessed.

Remedial Action
Whenever possible and practicable reduce vibration at source (reduce the level of excitation) by installing appropriate supports/dampering etc. For new construction the use of one piece short-bodied forgings rather than weidolet and nipple is preferred.

2 Transient Vibration

Transient Vibration Guidelines for Fast Acting Valves Screening Assessment, produced for HSE (OTO 2002/028).

They cover theory and screening methods to assess piping local to various types of valves. The output from the assessment, in conjunction with the SBCs screening assessment in item 1, provides a risk rating which can be mitigated against by applying the recommendations from these same guidelines.

3 Vibration in Flexible Risers

A Joint Industry Project (JIP) was established by BP, ExxonMobil, Statoil, the HSE and Bureau Veritas.

In the last few years several assets that utilise flexible risers for gas export have experienced high levels of piping noise and vibration resulting in piping failures and significant reductions in gas exports rate. The vortex shedding phenomenon within the flexible risers is the suspected cause.

The JIP deliverables include:
- Guidance to operators
- Increased awareness and understanding of the problem
- Screening methods to identify if a problem might be experienced
- Short-term integrity solutions
- Longer-term design guidance to avoid the problem
e Corrosion Management Guidelines

“The loss of hydrocarbon containment on offshore processing facilities due to corrosion can result in severe consequences upon safety, the environment and asset value.”

The Energy Institute/Oil & Gas UK document, *Guidance for corrosion management in oil and gas production and processing*, provides general principles, engineering guidance and requirements for improving corrosion management practices in oil and gas production and processing. It has been produced by an oil and gas industry workgroup with the objective of:

- reducing the number of corrosion related hydrocarbon releases and other safety related and environmentally damaging outcomes;
- identifying good practices for setting up an optimal corrosion management scheme, and
- providing an overview of the top corrosion threats to production and processing facilities downstream of the wells.

Corrosion management has been defined as the part of the overall management system that develops, implements, reviews and maintains the corrosion management policy and strategy and includes a clear set of corrosion management system requirements that can, and should, be considered normative.
To supplement this previous publication The Energy Institute, in association with Oil & Gas UK and The Health & Safety Executive, has produced the *Corrosion threats handbook for upstream oil and gas production plant*. The handbook has been commissioned as a concise reference tool to provide practical information to illustrate the corrosion degradation mechanisms likely to affect upstream oil and gas production systems, structures and components. The guide outlines the causes of the corrosion threats, shows typical locations for their occurrence and gives examples of how the threats may be managed.

The guide is intended for use by plant engineers and personnel with direct and indirect responsibility for the long term integrity of production facilities. It should assist system housekeeping and more formal integrity audits, and should also be of value to practitioners of Integrity Management, especially those less familiar with corrosion issues specific to oil and gas production plant.

The information should allow the user to:

- Understand the key corrosion threats (both internal and external corrosion)
- Understand the typical appearance of the main threats
- Understand where the threats may occur
- Identify the conditions which may give rise to threats
- Consider actions to mitigate the threats

The majority of the corrosion threats apply to carbon steel, the most commonly used material for upstream oil and gas production systems, structures and components. Threats to other material are identified.

The information in this guide should NOT be used to the exclusion of established and applicable codes, standards and criteria; nor should the threats and their manifestation described in this guide be seen as exhaustive. Please notify and consult with the relevant technical engineering authority/discipline specialists for investigation of potential threats or actual degradation that may be observed.

The corrosion threats in this guide are presented either as specific corrosion mechanisms, e.g. microbial corrosion, erosion corrosion; or by location, e.g. external corrosion under insulation. In addition to the threats which are strictly corrosion, three other degradation processes are included in this handbook. They are: erosion, fatigue and fretting. In practice, corrosion may be driven by two or more mechanisms. Typically, the resultant corrosion rate is faster than would be anticipated from a single mechanism.
Involvement

Why workforce involvement is important:

• The workforce are the eyes and ears around the installation
• They need to understand the role they play in reducing hydrocarbon releases
• They need to be onboard for the tools to work

There are many ways to communicate to the workforce:

Toolbox talks before any job – remind all personnel about the importance of looking for telltale signs of leaks or potential ‘hot spots’ and reporting them. Emphasise the need to double check all connections and valve status at the end of each task and work to procedures.

Safety meetings – discuss any recent leaks, their root causes and any lessons from these. Show awareness videos. Discuss any best practice guidelines.

Inductions – ensure all new starts are aware of the ‘no leak culture’ and the need for vigilance at all times for potential leaks and how to report them.

Poster campaigns, notice boards and leaflets – all help to raise awareness and ‘spread the word’.

Useful tips for successful communication:

• The ‘delivery’ of information is often through an individual supervisor, safety advisor or safety representative. It is important to ensure these individuals have the skills and the support material necessary to communicate effectively.

• Communication mechanisms need to be as diverse as possible to ensure the message reaches everyone and doesn’t get stale.

• Generally you will find that where people have been involved in establishing a particular process (and recognise that involvement) then they will be more receptive to further information relating to the ongoing operation or development of the process.

• Gather the views of the workforce, particularly on the shortcomings of your existing communications and processes. Seek further input from supervisors and safety reps as to the scope of future communications.

The HSE publication Play Your Part was revised in 2008 and contains many examples of good practice for workforce involvement.

This guidance, which was originally produced in response to Lord Cullen’s recommendation, is intended to help operators, contractors, trades unions, safety representatives and individual employees to co-operate to improve health and safety offshore through the active participation of the workforce.

The booklet has been prepared by the Workforce Involvement Group of the Offshore Industry Advisory Committee which is made up of industry representatives – employers, employees, trades unions etc – and draws on examples of good practice and success stories from the industry, involving the workforce in improving health and safety.
Lord Cullen said the whole workforce must be committed to safe working practices.

He picked out the safety representatives and committee system as the most visible way of involving the workforce. Other ways include giving information, improving communication at all levels, good induction and training, and making sure that people feel truly involved in the decisions affecting them.

Guidance on Effective Workforce Involvement in Health and Safety – published by The Energy Institute, 2008

This guide has been developed for everyone who wants to find out more about WFI and improving its effectiveness. It details the issues surrounding WFI and describes a three step approach to its implementation, and is supported by case studies and assessment exercises.

The information contained within the guide could help improve safety management systems. The guidance focuses on health and safety but the information and techniques can also be used to help involve workers in other areas of work, e.g. design, making decisions about environmental protection or considering ways to improve quality.

**Where are we now?**

- Assess current WFI in health and safety management
- Assess the factors that influence WFI

**Ways to improve?**

- Plan WFI improvements
- Select methods to improve WFI in Health and Safety Management
- Address factors that influence WFI
- Get started

**Sustaining WFI**

- Maintaining momentum
- Monitor and review
- Set new targets

Examples and case studies are provided in this guide for each of these stages

Three step approach for improving WFI
The vital part of the system

The most important part of any process is the audit/review/feedback loop. Lots of time, effort and money is put into engineering solutions as well as new inspection and maintenance criteria. However unless we complete the loop to ensure that these changes have been effective this is pointless.

Audits are the way to maintain continuous improvement in a process. Findings from the audit should be discussed, lessons learned should be shared and processes amended and communicated to relevant parties accordingly. This is where this toolkit could be used to best advantage. Ensure your audit schedule includes the topics covered in this toolkit to prevent leaks.

For an audit schedule to be effective it should include: independent audits; management-level audits; system audits; procedure audits and task-based checks to ensure the full range of activities has been addressed. A checklist with useful questions about what requires to be audited is overleaf.
## TOOL # 5
### AUDIT

### Are you doing all this?

**Questionnaire/Check List on release reduction activities:**

<table>
<thead>
<tr>
<th>Question</th>
<th>YES</th>
<th>NO</th>
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<tbody>
<tr>
<td>1. Have any high-level company goals or targets been set for release reduction in your annual or longer-term Business Plans?</td>
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<td>2. Have any specific leak targets been set for individual assets/platforms to achieve a reduction in releases?</td>
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<tr>
<td>3. Have any targets been set for monitoring and tracking specific release activities/actions/problem areas?</td>
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<tr>
<td>4. Is release performance monitored and reported on?</td>
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<tr>
<td>5. Does your company keep its own hydrocarbon release statistics/database?</td>
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<td>6. Is past performance on releases analysed for trends and learning?</td>
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<tr>
<td>7. Have you identified your problem areas?</td>
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<tr>
<td>8. Is there a hydrocarbon release reduction person/focal point or team in your company?</td>
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<tr>
<td>9. Is there any structured release reduction programme?</td>
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<tr>
<td>10. Is your company aware of the HSE website for hydrocarbon release information and reporting releases?</td>
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<tr>
<td>11. Is your company registered to use the HCR system?</td>
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<tr>
<td>12. Do you have an onshore focal point for co-ordinating and submitting OIR/12 forms to the HSE via the website?</td>
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<tr>
<td>13. Do you carry out an onshore process review of all data submitted on Form OIR/12, including a check/calculation of the mass of any release prior to submission to the HSE?</td>
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<tr>
<td>14. Have you compared your company leak performance with industry performance?</td>
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<tr>
<td>15. Is your company aware of the Guidelines on The Management of Bolted Pipe Joints?</td>
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<td>16. Has your company committed to implementing these Guidelines?</td>
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<tr>
<td>17. Is your company training personnel on flange make up?</td>
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<td>18. Does your company plan to make flange make up training a required competency?</td>
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<tr>
<td>19. Does your company have, or plan to have, a flange tagging system?</td>
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<tr>
<td>20. Is your company aware of the Flexible Hose Management Guidelines?</td>
<td></td>
<td></td>
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<tr>
<td>21. Has your company committed to implementing these Guidelines?</td>
<td></td>
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<tr>
<td>22. Does your installation have a register of Flexible Hose Assemblies (FHAs)?</td>
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<td>23. Does your installation have an inspection strategy for Flexible Hose Assemblies?</td>
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<tr>
<td>No</td>
<td>Question</td>
<td>YES</td>
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<td>--------------------------------------------------------------------------</td>
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<tr>
<td>24</td>
<td>Do you ensure the correct FHAs are being used for the application?</td>
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<tr>
<td>25</td>
<td>Is your company aware of the Guidelines on the Management of Small Bore</td>
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<td></td>
<td>Tubing Fittings?</td>
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<tr>
<td>26</td>
<td>Has your company committed to implementing these Guidelines?</td>
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<tr>
<td>27</td>
<td>Has your company applied the recommendations/guidance from the Guidelines</td>
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<tr>
<td></td>
<td>mentioned above?</td>
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<tr>
<td>28</td>
<td>Have all personnel making up compression fittings on your company’s</td>
<td></td>
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<td></td>
<td>installations been trained to do so and deemed competent?</td>
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<tr>
<td>29</td>
<td>Is your company aware of the Guidelines for the Avoidance of Vibration</td>
<td></td>
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<td></td>
<td>Induced Fatigue in Process Pipework?</td>
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<tr>
<td>30</td>
<td>Has your company committed to implementing these Guidelines?</td>
<td></td>
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<tr>
<td>31</td>
<td>Has your company applied the recommendations from the Guidelines</td>
<td></td>
</tr>
<tr>
<td></td>
<td>mentioned above?</td>
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<tr>
<td>32</td>
<td>Do you take due account of piping vibration as an integrity threat in</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HAZOP/HAZID forums?</td>
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<tr>
<td>33</td>
<td>Are operations and process engineering personnel aware of the threat of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>vibration induced fatigue and its contributory factors?</td>
<td></td>
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<tr>
<td>34</td>
<td>Has a structured risk assessment methodology been followed to identify</td>
<td></td>
</tr>
<tr>
<td></td>
<td>potential vibration problem areas?</td>
<td></td>
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<tr>
<td>35</td>
<td>Have remedial actions been identified following a structured assessment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>of vibration issues?</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Have these actions to prevent vibration been correctly implemented?</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Is your company aware of the report on The Review of Corrosion Management</td>
<td></td>
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<tr>
<td></td>
<td>for Offshore Oil &amp; Gas Processing (OTO 2001/044)?</td>
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<tr>
<td>38</td>
<td>Has your company applied the recommendations and good practice</td>
<td></td>
</tr>
<tr>
<td></td>
<td>guidance on corrosion management?</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Have any release reduction awareness programmes been undertaken?</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Have presentations/visits been made offshore to raise awareness on</td>
<td></td>
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<tr>
<td></td>
<td>release reduction?</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Has the Step Change in Safety DVD video on hydrocarbon release reduction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>been shown to all relevant staff on and offshore?</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Are there any regular reports, bulletins, newsletters etc. on release</td>
<td></td>
</tr>
<tr>
<td></td>
<td>reduction issues/learning?</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Do you have an appropriate programme of refresher training in all</td>
<td></td>
</tr>
<tr>
<td></td>
<td>relevant competency areas?</td>
<td></td>
</tr>
</tbody>
</table>
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3 Flexible Hose Management Guidelines
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5 Compression Fittings and Small Bore Tubing Awareness
For more information about this CD-ROM please contact the EI’s publications department on Tel: 020 7467 7100 or e-mail pubs@energyinst.org.uk.

6 Guidelines for the Avoidance of Vibration Induced Fatigue in Process Pipework
Originally published by MTD, available from the Energy Institute. For more information or to place an order, please contact the EI’s publications department on Tel: 020 7467 7100 or e-mail pubs@energyinst.org.uk.

7 Transient Vibration Guidelines for Fast Acting Valves Screening Assessment

8 Guidance for Corrosion Management in Oil & Gas Production Processing
Published by the Energy Institute in May 2008; available from the EI’s publications department on Tel: 020 7467 7100 or e-mail pubs@energyinst.org.uk & the Oil & Gas UK website www.oilandgasuk.co.uk.

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Published by the Energy Institute in 2008 & available the EI’s publications department on Tel: 020 7467 7100 or e-mail pubs@energyinst.org.uk & the Oil & Gas UK website www.oilandgasuk.co.uk.
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