Guidelines for the management of obsolescence in subsea facilities

GUIDELINES FOR THE MANAGEMENT OF OBSOLESCENCE IN SUBSEA FACILITIES

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t: +44 (0)1206 796 351 e: **sales@portland-services.com**

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FOREWORD

These guidelines provide all those with an involvement in subsea systems - designers, equipment manufacturers, fabricators, installers, operators, integrity and maintenance engineers, etc. - whether in operators or supply companies, with guidance on how to manage obsolescence in subsea equipment. Note that, in this regard, subsea equipment refers to any equipment dedicated to the operation and control of subsea facilities, even if the equipment itself is located topsides. The equipment of greatest interest in this respect is the subsea production control system (SPCS) and the chemical injection system (CIS), although mechanical equipment may also be affected, and may become more critical as more complex functions (e.g. separation and processing) are located subsea.

Although instigated by, and produced for, the UK offshore industry, it is regarded as being applicable to similar industries throughout the world.

This publication was written and compiled under the direction of a steering group comprising personnel from a cross section of UK offshore operators, specialist service contractors and independent verification bodies who play a key role in the design and operation of subsea facilities for the offshore oil and gas industry. The steering group members also provided input to the development via discussion at meetings, individual contributions and with provision of industry experience and other selected information.

This publication has been compiled for guidance only and while every reasonable care has been taken to ensure the accuracy and relevance of its contents, the Energy Institute (EI), its sponsoring companies, the publication writer and the Steering Group members listed in the Acknowledgements who have contributed to its preparation, cannot accept any responsibility for any action taken, or not taken, on the basis of this information. The EI shall not be liable to any person for any loss or damage which may arise from the use of any of the information contained in any of its publications.

These guidelines may be reviewed from time to time and it would be of considerable assistance for any future revision if users would send comments or suggestions for improvements to:

The Technical Department
Energy Institute
61 New Cavendish Street
London
W1G 7AR
e: **technical@energyinst.org**

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PUBLICATION FORMAT

Part A presents the high level management policy and principles, and the framework under which a successful obsolescence management process can be achieved. It is recommended reading for all senior managers whose responsibilities are associated with the design or operation of offshore assets. Part B provides detailed guidance for practitioners of obsolescence management. It addresses the selection of a management strategy (with supporting information in Annex A), and describes the activities associated with all phases of the life cycle of a subsea system. Key tasks and responsibilities are described. The section on obsolescence monitoring and reviews also develops the idea of a three-dimensional risk matrix (with supporting information provided in Annex D).

Annex B provides a review of the various equipment and its tendency to obsolescence, although this is only provided as a guide and should not replace robust obsolescence management.

Throughout the publication, where there is a difference in the guidance between operators and suppliers, this is highlighted; otherwise it is considered to be equally applicable.

PART A
MANAGEMENT POLICY

1 INTRODUCTION

1.1 OBSOLESCENCE

A component or module is 'obsolete' when it can no longer be procured, or support has been withdrawn. In the context of subsea facilities, this means that like-for-like replacement of a failed component is no longer possible. 'Obsolescence' refers to the period after the manufacturer has announced that production will be discontinued, or that support will be withdrawn, during which remaining stocks are run down.

The management policy defines the basis upon which the requirement for an obsolescence management (OM) process for a subsea facility (as defined in section 3.1 of Part B) is established. For a full understanding of the process, Part B should be consulted.

Typical policy recommendations follow:

– All components of every asset shall be designed in full accordance with the relevant codes and standards applicable. Similarly, obsolescence management practice shall adhere to the relevant codes and standards and recognised good practice.

– All risks to safety or the environment that arise due to the operation of any asset shall be identified and quantified (numerically or subjectively), and the asset shall be managed so as to reduce or mitigate these risks to be as low as reasonably practicable (ALARP).

– The obsolescence strategy shall be defined (in accordance with these guidelines) and shall be promulgated around the organisation, and to all suppliers, potential or actual. This shall include guidance on life-of-field agreements.

– The obsolescence management process shall be subject to regular review (to make sure the strategy and processes remain fully applicable and effective).

– Lessons learnt from every asset shall be communicated throughout the organisation (and around the wider subsea community, as appropriate) so that the performance of all assets is continually improved, and lessons learnt with regard to the impact of obsolescence.

– Any asset has been designed, installed and commissioned, and is now operated, to be reliable, maintainable and cost-effective, and not impaired by obsolescence, throughout the field life.

– It is recognised that the cost of repeated intervention throughout the life cycle, especially in deep water, will exceed by many times the incremental costs associated with achieving, through good design, fabrication and installation, a reliable and maintainable subsea facility.

1.2 KEY PRINCIPLES

The key principles for a successful and effective OM process follow:

- The policy, and the obsolescence management strategy, should be authorised at the highest level in the organisation and should be promulgated to every person who has an involvement with subsea operations, in every asset, as a fundamental aim of the organisation.
- The organisation should provide adequate resources, in terms of both personnel and equipment (including software), for the achievement of the policy.
- The organisation should define key OM roles, and their responsibilities, in accordance with these guidelines, and with its management structure.
- The organisation should require the definition of the obsolescence management plan (OMP) by the designated responsible individual(s).
- The organisation should ensure that the processes are reviewed regularly.
- The reports required by senior management should be clearly defined.
- Particular attention should be paid to managing interfaces in the system - e.g. between technical groups, between the organisation and third parties, and between project phase and operations.
- The term 'failure' should be clearly defined, in the context of obsolescence, as any condition in which a system, process, equipment or component no longer has the ability to perform its intended or required function such that target production performance cannot be achieved.
- Obsolescence may also be revealed by upgrades to systems to accommodate changes to field architecture (e.g. a brownfield tie-in).
- All circumstances where obsolescence impacts performance should be fully investigated and the outcomes communicated to ensure that lessons are learnt and good practice updated.
- It should be emphasised that OM commences during the design phase, and continues throughout the life cycle until the decommissioning phase.
- Obsolescence, especially of software, may be brought about by the loss of skills, knowledge or experience, leading to loss of support by a supplier.
- Ideally, reliability, obsolescence and integrity should be treated as an integrated whole and managed in parallel.
- This guideline should be consulted by every engineer involved with reliability or obsolescence at any point in the life cycle of a subsea facility, from conceptual design to decommissioning. It aims to be the primary guide for design engineers, installation engineers, and those engineers working in the supply chain during projects; and for reliability, integrity and subsea maintenance engineers during operations. It should also be consulted by all asset managers and project managers, who should fully understand the potential impact of obsolescence on production.