Guidelines to address ageing and life extension issues for offshore structures and structural components

GUIDELINES TO ADDRESS AGEING AND LIFE EXTENSION ISSUES FOR OFFSHORE STRUCTURES AND STRUCTURAL COMPONENTS

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FOREWORD

This document has been produced by Atkins on behalf of the Energy Institute (EI). It is intended to address ageing and life extension issues for offshore structures and structural components.

Although it is anticipated that this publication will assist those involved in the maintenance and operation of ageing structures, the information contained in this publication is provided as guidance only. While every reasonable care has been taken to ensure the accuracy of its contents, the EI, and the technical representatives listed in the acknowledgements, 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.

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Suggested revisions are invited and should be submitted to the Technical Department, Energy Institute, 61 New Cavendish Street, London, W1G 7AR, or email: technical@energyinst.org.

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1 INTRODUCTION

1.1 INTRODUCTION

Worldwide there are many fixed offshore installations that have reached, or indeed exceeded, their original design life. During the life cycle of these assets there is a need to ensure that structural integrity is suitably maintained, which is achieved through the application of a robust structural integrity management system (SIMS). The SIMS must ensure that as the structure ages any degradation is properly predicted, detected, assessed and remediated.

There is considerable information available publicly for the application of SIMS. These guidelines aim to complement existing information on SIMS, to address issues specifically related to ageing and life extension.

This publication guides the reader through the engineering evaluation and assessment process that results from ageing-related triggers. There is an emphasis on structural analysis and the resolution of code non-compliance.

Guidance provided for analysis is in a phased approach, in that the complexity of analysis approach increases incrementally, leading to increasingly accurate assessment of integrity provided it is performed by suitably competent engineers.

1.2 SCOPE

This publication provides guidance to address common issues relating to the ageing and life extension of offshore structures. It is intended to cover issues relating to the structural discipline only. Guidance is included for the following:

– fixed steel jacket structures, and
– topsides structures.

This document excludes guidance for the following:

– floating structures;
– concrete structures;
– wind turbine support structures;
– pressure containing equipment and tanks;
– welded equipment supports;
– lifting equipment, and
– fire and blast assessment.