Guidelines for the integrity management of offshore platform conductors

energy institute

GUIDELINES FOR THE INTEGRITY MANAGEMENT OF OFFSHORE PLATFORM CONDUCTORS

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FOREWORD

The intention of this publication is to provide guidance to address structural integrity management of offshore platform conductors, to facilitate good practice regarding the design, operation and integrity management of the wells during their lifetime.

This document focuses on wells located within the North Sea; however, the response of these systems and the key considerations explained herein apply to wells globally. These guidelines apply to shallow water platform conductors with surface wellheads. The focus of this guidance is on the integrity management of untensioned systems, and the behaviour exhibited by conductors under significant levels of compressive load, including instability and reduced fatigue performance relative to a tensioned system.

Although it is anticipated that following this publication will assist those involved in structural integrity management of ageing offshore platform well conductors, 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 Energy Institute (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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1 INTRODUCTION

1.1 BACKGROUND

Platform conductors provide a safety-critical function in offshore hydrocarbon wells, in that they protect the surface casing string from environmental loading and, for some wells, provide structural support to the wellhead. Consequently, failure of a conductor can result in a significant integrity threat to the installation.

With the average age of North Sea platforms now exceeding 30 years, the frequency of integrity-related issues in conductors is increasing. The root causes of these issues are primarily time degradation mechanisms, including wall thickness loss due to corrosion, fatigue failures, and the loss of centralisation from ageing centralisers and platform guides.

Managing the integrity of a platform conductor requires a holistic approach, due to the interdependent relationship between the conductor, the internal well casings, and the platform structure. The importance of the well and the platform structure needs to be considered not only during the design of the system but throughout its operational life, as changes to the well throughout its lifetime can have a significant effect on the response of the conductor.

1.2 SCOPE

The aim of these guidelines is to explain key aspects relating to structural integrity management of offshore platform conductor wells in the North Sea, and to advise on best practice regarding the design, operation, and integrity management of the wells during their lifetime.

This document focuses on wells located within the North Sea; however, the response of these systems and the key considerations explained herein apply to wells globally. It should be noted, however, that depending on the location, additional considerations may apply. For example, in the Middle East, rates of corrosion may be faster due to elevated temperatures, and for wells located extremely far North, icing of the platform may occur. Such regional considerations are outside the scope of this document.

These guidelines apply to shallow water platform conductors with surface wellheads. Subsea well systems utilising high pressure risers are not included within the scope of this document. The focus of this guidance note is on conductors which are not supported by tension, neither pull-up nor push-up systems. Conductors under applied tension exhibit superior performance than those in which tension is not applied. This document focuses on the integrity management of untensioned systems and the behaviour exhibited by conductors under significant levels of compressive load, including instability and reduced fatigue performance relative to a tensioned system. Although the document does not cover wells with externally applied tension, the document does cover the case where the conductor may be in tension as a result of thermal loading due to high well bore temperatures.

The scope of this document is limited to single well conductors. Production platforms may have one or more single well conductors. Splitter wells are outside the scope of this document.