Guidelines for the management of the integrity of bolted joints for pressurised systems

2nd edition

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FOREWORD

The first Issue version of this document has its roots set in the upstream oil and gas industry being part of the HSE/industry drive to reduce the incidence of hydrocarbon leaks on offshore installations. Leaking joints have been the main cause of hydrocarbon releases on the UKCS offshore sites and there exists similar concern for the vast number of facilities handling petrochemical and other hazardous material on main land sites.

In 2005, the UKOOA (now Oil & Gas UK) led Installation Integrity Working Group (IIWG) requested that the Energy Institute manage the review and revision of the Joint UKOOA/IP *Guidelines for the management of the integrity of bolted pipe joints* first issued in June, 2002. This project required the formation of a cross-industry Work Group (WG) many of whom were from that used to compile Issue One. Others included those from the parent IIWG members, consultants and representation from the industry training organisation, ECITB.

The revision exercise was part of the programme of work undertaken by the IIWG which included development and promotion of industry good practices and suitable performance measures. The principal deliverables of this Work Group were an Asset Integrity Tool Kit and review and revision of guideline documents one of which was for the management of integrity of bolted pipe joints. It is therefore considered that this Guideline will provide valuable advice to assist operators manage plant integrity for any installation employing bolted joints.

During the review process, the WG elected to widen the scope to include bolted joints used within pressurised systems and not just pipe joints as is the case for Issue One, and to ensure that the document is applicable to onshore industries as well as offshore oil and gas.

This document has been compiled as guidance only and is intended to provide knowledge of good practice to assist operators develop their own management systems. While every reasonable care has been taken to ensure the accuracy and relevance of its contents, the Energy Institute, its sponsoring companies, section writers and the Work 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 Energy Institute 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.

This Guideline will be reviewed in the future and it would be of considerable assistance for any subsequent revision if users would send comments or suggestions for improvements to:

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The Institute also wishes to recognise the contribution made by those who have provided comments on the Draft document which was issued during an industry consultation period.

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INTRODUCTION

A bolted joint is one of many 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).

This document describes the principles and good practice for the establishment of a management system for bolted joints in pressurised systems. Individually the sections of this document 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.

This document is not intended as a design guide for bolted joints, but as a guide to 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.

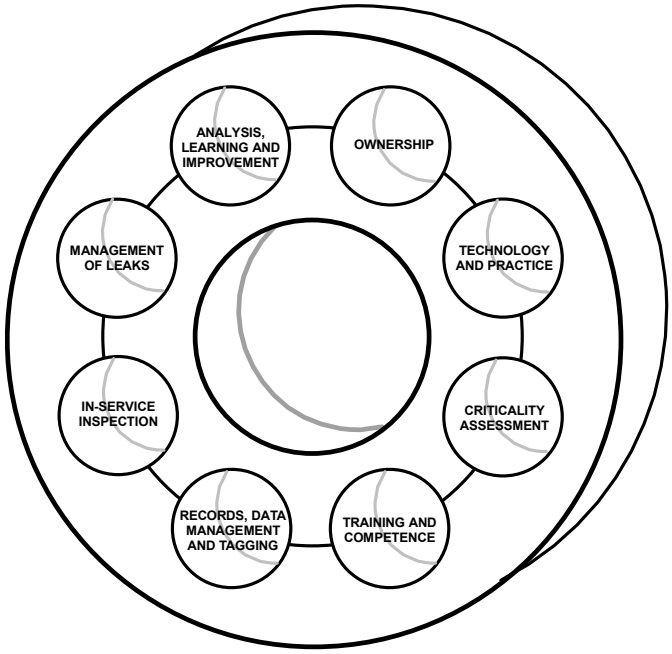

Figure 1.1: Essential elements of a management system