Guidance on integrity testing for offshore installation temporary refuges

energy institute

GUIDANCE ON INTEGRITY TESTING FOR OFFSHORE INSTALLATION TEMPORARY REFUGES

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FOREWORD

This guidance has been developed by the Energy Institute (EI) Steering Group on temporary refuge (TR) integrity testing and has been researched and written by MMI Engineering (MMI).

The objective is to provide a single methodology for testing and reporting the integrity of offshore TRs with regard to air leakage rate and the potential for ingress of gas or smoke.

The intended users of this guidance are duty holders and all persons involved in the operation, testing and maintenance of offshore temporary refuges. This will typically include the owner/operator of the offshore platform where the TR is located, the offshore installation manager, offshore maintenance engineer/technicians, offshore safety engineer and any independent test organisations which may carry out integrity testing on the TR.

The guidance is intended primarily for use in the United Kingdom (UK) offshore industry.

Whilst written in the context of the UK legislative and regulatory framework, the principles set out in this publication can similarly be applied in other countries, providing national and local statutory requirements are complied with. Where the requirements differ, the more stringent should be adopted. A similar legislative and regulatory framework generally applies elsewhere in the European Communities.

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DEDICATION

This first edition guidance is dedicated to Keith Lewis, process safety professional and valued colleague, who did much to pass on his wealth of experience and to lead 'younger' process safety professionals across the industry.

1 INTRODUCTION

A TR provides an important component of safety on an offshore platform and the Cullen Report into the Piper Alpha disaster recommended that a TR should be provided on all offshore installations. Most offshore safety cases attribute high availability and survivability of the TR as a key component in establishing an acceptable risk profile for the installation.

The UK Health and Safety Executive (HSE) document *Assessment principles for offshore safety cases*, Principle 22 defines the TR as: 'a place where personnel can muster safely in an emergency, monitor and assess the developing situation, and either take control action or initiate evacuation'. The TR provides protection from credible fire and explosion scenarios and has some sealing function to prevent excessive air outflow and ingress of toxic smoke and gases. The key component of the TR which provides the sealed environment is usually the Heating, Ventilation and Air Conditioning (HVAC) fire dampers. Other potential air leakage paths include door seals, windows, cable and pipe penetrations, water traps and degradation of the TR structure itself.

Ongoing assurance of a TR's physical integrity against smoke and gas ingress is therefore a critical activity. Proper integrity testing should demonstrate the effectiveness of the TR to protect personnel from the effects of fire, smoke and toxic fumes during a major incident as required by the Offshore Installations (safety case directive) (Safety Case etc) Regulations 2015. The effectiveness of this depends on the ability of the TR boundary to withstand the hazards associated with these events, including blast, impact and fire.

A number of national, international and industry bodies have released methodologies for leakage testing and permeability assessment of onshore buildings and rooms. However, before the issue of this guidance there was no test standard or guidance specific to the offshore industry. Furthermore, anecdotal evidence from offshore operators pointed clearly to some inconsistencies in the way such testing is carried out between test organisations and operators.

This guidance is intended to provide a standard methodology to the offshore industry to perform air-tightness testing as part of their demonstration of the integrity of the TR and on-going safety management procedure.

2 SCOPE

This guidance is intended for application to testing offshore installation TRs only.

It may also be used to test leakage properties of other enclosed spaces on offshore installations, although in this case the definition of test pressures and limiting leakage rates may need to be adjusted to suit the duty of the particular enclosure.

This guidance note is not applicable to testing onshore buildings or enclosures as the environmental conditions are likely to be significantly different. In this instance the relevant British Standard is BS EN 13829:2001 *Thermal performance of buildings* and the guidance therein may be appropriate depending on the function of the building.

3 APPLICATION

This guidance should be used by offshore duty holders, as part of their TR integrity assessment and maintenance procedure and by independent test organisations commissioned by offshore duty holders to carry out TR testing.

HSE Offshore Information Sheet No 1/2006 *Testing regime for offshore TR-HVAC fire dampers and TR pressurization requirements, 2007* recommends that TR pressurization tests are carried out at a frequency of no less than three years and preferably every two years. Duty holders may require tests more frequently than every two years to build up sufficient data to understand the reduction in performance of the TR over a period of time and the effect of environmental conditions on TR performance.