

Guidance on applying inherent safety in design:  
Reducing process safety hazards whilst optimising  
CAPEX and OPEX

2nd edition

GUIDANCE ON APPLYING INHERENT SAFETY IN DESIGN:  
REDUCING PROCESS SAFETY HAZARDS WHILST OPTIMISING CAPEX AND OPEX

2nd edition

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## FOREWORD

The greatest opportunities to reduce risks from process facilities with potential for harm to people and/or the environment occur during the design. The principles of inherent safety in design (ISD) are well established but are often not systematically applied.

This publication is aimed at project leaders and provides encouragement and guidance on the practical application of ISD during the early stages of design in order to gain maximum benefits in terms of reducing both hazards and life cycle costs.

This publication addresses the lack of tools to identify potential ISD improvements, particularly during the early conceptual design stage where potential benefits are greatest. Setting ISD goals for the project during this stage and carrying out an ISD workshop should make a significant contribution towards safer facilities in the future. In time and as technology progresses, serious process safety incidents should be eliminated at the 'drawing board', rather than relying on 'add-on' safety systems that can and do fail, revealing weaknesses in the basic process design.

Traditional process safety approaches have often required 'add-on' risk safety systems that are costly to install and maintain. By comparison, ISD provides the opportunity to eliminate hazards or reduce their severity or likelihood by better design, with the potential of reducing overall capital expenditure (CAPEX) and operating expenditure (OPEX). ISD should promote a culture of challenging the need for designs that rely on 'add-on' safety systems, by confirming why they are needed, and how the need could be avoided by improving the basic process design.

The first edition of this publication (*Guidance for safer design of offshore installations: An overview*) was also sponsored by the GB Health & Safety Executive (HSE) and UK Offshore Operators Association (UKOOA), and aimed to reduce the occurrences of adverse findings in design safety cases for the UK offshore oil and gas sector. The scope of this second edition is broadened to large and small organisations in the global energy industry, including offshore production platforms, and onshore facilities such as petroleum refineries, bulk fuel storage installations, and power generation stations.

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