

A risk-based approach to hazardous area classification

A RISK-BASED APPROACH TO
HAZARDOUS AREA CLASSIFICATION

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FOREWORD

The objective of this report was to develop a means for establishing the outer boundaries of Zone 2 hazardous areas taking account of the risks associated with contributory factors.

This second edition of *A Risk Based Approach to Hazardous Area Classification* report was updated by the Energy Institute's Area Classification Working Group who are also responsible for updating the area classification guidance – *Model Code of Safe Practice part 15: Area classification for installations handling flammable fluids* (EI 15). The content of this report is used in the fourth edition of EI 15 and as a source of reference for the application of the risk-based approach.

Following publication of the first edition of the *Risk Based Approach to Hazardous Area Classification*, the Energy Institute commissioned Quantra Limited to analyse the HSE Hydrocarbon Release Database⁽⁸⁾ data to determine more accurately a release hole size frequency data set, thus Table 6 has been modified. The report *Analysis of the HSE Hydrocarbon Release Database for use with EI 15* is appended to this publication in Annex D. The frequency calculations shown in (Annex A of) the first edition are therefore superseded and have been deleted.

Calculations outlined within the Energy Institute's Research Report – *Dispersion modelling and calculations in support of EI Model code of safe practice part 15: Area classification for installations handling flammable fluids, second edition*, supersede the previous Annex D Calculations for Hazardous Areas of the first edition, and therefore this content has been deleted and replaced by the Quantra report⁽⁸⁾, as stated in paragraph four.

Although it is believed that adoption of the procedure in this report for determining the boundaries of hazardous areas will provide an adequate level of safe operation, the Energy Institute cannot accept responsibility of whatsoever kind, for damage or alleged damage arising or otherwise occurring in or about premises, installations, areas or vehicles to which the contents of this report have been applied.

KEY TECHNICAL CHANGES

The following technical changes have been made to this edition:

- Includes the Quantra Ltd. report – *Analysis of the HSE Hydrocarbon Release Database for use with EI 15*.
- Release hole sizes for the risk-based approach have been revised based on the values provided by the Quantra Ltd. analysis and technical judgement of the Area Classification Working Group (see Annexes D and E and Table 6).
- Reference to the EI Research Report *Ignition probability review, model development and look up correlations* ⁽⁷⁾ as an alternative approach for determining P_{ign} .
- Dispersion modelling calculations are now carried out by reference to EI Research Report – *Dispersion modelling and calculations in support of EI Model code of safe practice Part 15: Area classification code for installations handling flammable fluid* ⁽⁹⁾, that replaces first edition Annex D.

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This report has been updated by Mr Kieran Glynn of BP International on behalf of the Energy Institute (EI) Area Classification Working Group, convened to review and update the area classification guidance – *Model Code of Safe Practice Part 15: Area Classification for installations handling flammable fluids*.

The EI would like to thank Kieran Glynn and Stephen Hall (Quantra Ltd.) for their contributions to this second edition of the *A Risk based approach to hazardous area classification*.