UKOPA
United Kingdom Onshore Pipeline Operators' Association

Development of Supplements to BS PD 8010 and IGEM TD/1 to Provide a Codified Approach for the Application of Pipeline Risk Assessment for LUP Advice to Local Planning Authorities

Background

In their capacity as a statutory consultee, the HSE has responsibility to provide advice to Local Planning Authorities (LPAs) relating to the safety of developments proposed in the vicinity of hazardous installations and pipelines. This duty relates to public safety.

In this connection, the HSE has issued advice to all LPAs relating to the acceptability or otherwise of proposed developments – PADHI (Planning and Development in the vicinity of Hazardous Installations). The advice is relevant to all notified Major Accident Hazard Pipelines (MAHPs), and is based on the standard notified details of individual pipelines. The advice takes the form of Land Use Planning zones, dependent on the proximity of the proposed development to the pipeline. HSE apply a standard quantified risk assessment based on a standard set of conditions which may to obtain Land Use Planning zones. The advice is based on the location of the proposed development within these zones. However, the advice based on these zones may not be relevant to the location of the proposed location. In particular, it does not take account of any mitigating factors affecting the risk to the surrounding population which would possibly allow developments to be acceptable when the HSE advice may indicate otherwise. The advice also does not include any allowance for potential mitigation measures which could be applied as part of the development. These include engineering changes, which at small extra cots, could allow a development to proceed within the context of HSE's advice.

The HSE however advises LPAs to contact the pipeline operator to obtain i) site specific information which may be relevant, and ii) advice on how this may be used, but there is no agreed or codified method for the provision of this additional advice by operators. The potential therefore exists for non-acceptance of the operator advice by HSE.

Purpose of Development of Supplements to BS PD 8010 and IGEM TD/1

The purpose of producing supplements to BS PD 8010 and IGEM TD/1, which are pipeline codes accepted by HSE, is to provide authoritative and accepted guidance on the risk analysis of:

i) site specific pipeline details, for example increased wall thickness, pipeline protection (such as slabbing) depth of cover, damage type and failure mode, and
ii) the impact of mitigation measures which could be applied as part of the development.

The availability of this codified advice would ensure a standard and consistent approach, and reduce the potential for disagreement between HSE and pipeline operators with respect to the acceptability of proposed developments. Implicit in this is the fact that the HSE accept that compliance with the codes BS PD 8010 and IGEM T/D1 demonstrates compliance with safety legislation.

Requirements for Codified Approach

The codification of a methodology for the evaluation of pipeline risks requires the following:-

i) Definition of the hazardous substances covered:
   a. Natural Gas
   b. Ethylene
   c. Spiked crude
   d. Ethane, propylene, LPG, NGL

ii) Standard definitions for the pipeline failure modes:
   a. Rupture
   b. Break
   c. Major leak
   d. Minor Leak
   e. Pinhole leak

iii) Recognised/accepted reference(s) for operational fault/failure data
   a. UKOPA
   b. CONCAWE
   c. EGIG
   d. Development for Engineering Mitigation Factors

iv) Failure frequency prediction models based on use of recognized operational data:
   a. 3rd party damage
   b. Corrosion
   c. Material/weld defect
   d. Natural Causes/external load
   e. Operational failure
   f. Other

v) Recognised and accepted consequence models:
   a. Fireball
   b. Jet fire
   c. Flash fire
   d. Pool fire
   e. Spray fire

vi) Defined failure scenarios and associated event trees, including
   a. Ignition probability
   b. Immediate/delayed ignition
   c. Weather effects (eg wind speed and direction)
   d. Population/occupancy models (including day vs night assumptions)
   e. Escape/shelter models

vii) Defined LUP Individual Risk criteria:
   a. Inner zone - 1 x BPD or 1 x 10^{-5} cpm risk of fatal injury per year
   b. Middle zone – 1 x 10^{-6} risk of fatal injury per year
   c. Outer zone – 0.3 x 10^{-6} risk of fatal injury per year

viii) Societal Risk criteria:

a. Development of methodology for use of IGEM TD/1 F-N curve for gas pipelines
b. Development of F-N curve and methodology for use for non-gas pipelines for inclusion in BS PD 8010 supplement.

ix) Defined mitigation methods and associated risk reduction factors:
a. Protection
b. Marking
c. Depth of cover

x) Defined development categories/population types

Outline Work Programme

Requirement	Substance			
	Natural Gas	Ethylene	Spiked crude	Other
Failure Modes Failure Data Frequency prediction	√	√	April 05	June 05
UK risk of Ground Movement	June 05	Aug 05	Aug 05	Aug 05
Consequence Models	√	√	April 05	June 05
Accident scenarios and event trees	√	√	June 05	June 05
Generic LUP Zones	√ To be revised when 2 available	April 05, to be revised when 2 available	July 05	Aug 05
Mitigation Measures	√	April 05	April 05	April 05
Risk Reduction Factors	June 05	June 05	June 05	June 05

Outline Publication Programme for Code Supplements:

In order to meet a proposed publication date for the BS and IGEM code supplements, the following programme is proposed:

Outline draft (Scope, format, available material)	30th April 05
Working draft for technical comment	30th June 05
Final draft (for public consultation/independent review)	31st Aug 05