Application of Pipeline Risk Assessment to Proposed Developments in the Vicinity of Major Hazard Pipelines

Development of PD 8010 and TD/1 Code Supplements

Progress Report - May 2006

UKOPA/06/0043

Status of Code Supplements

- First committee drafts have been circulated by Standards Bodies
- Detailed comments received, reviewed and addressed
- Second draft (addressing comments and RAWG requirements) expected to be circulated by Standards Bodies by end Jan
- Outstanding work identified and prioritised by RAWG
- Programme for completion of work developed

Overview of Contents

Technical Appendices

1 Typical LUP Zones for MAHPs

2 Pipeline BPDs

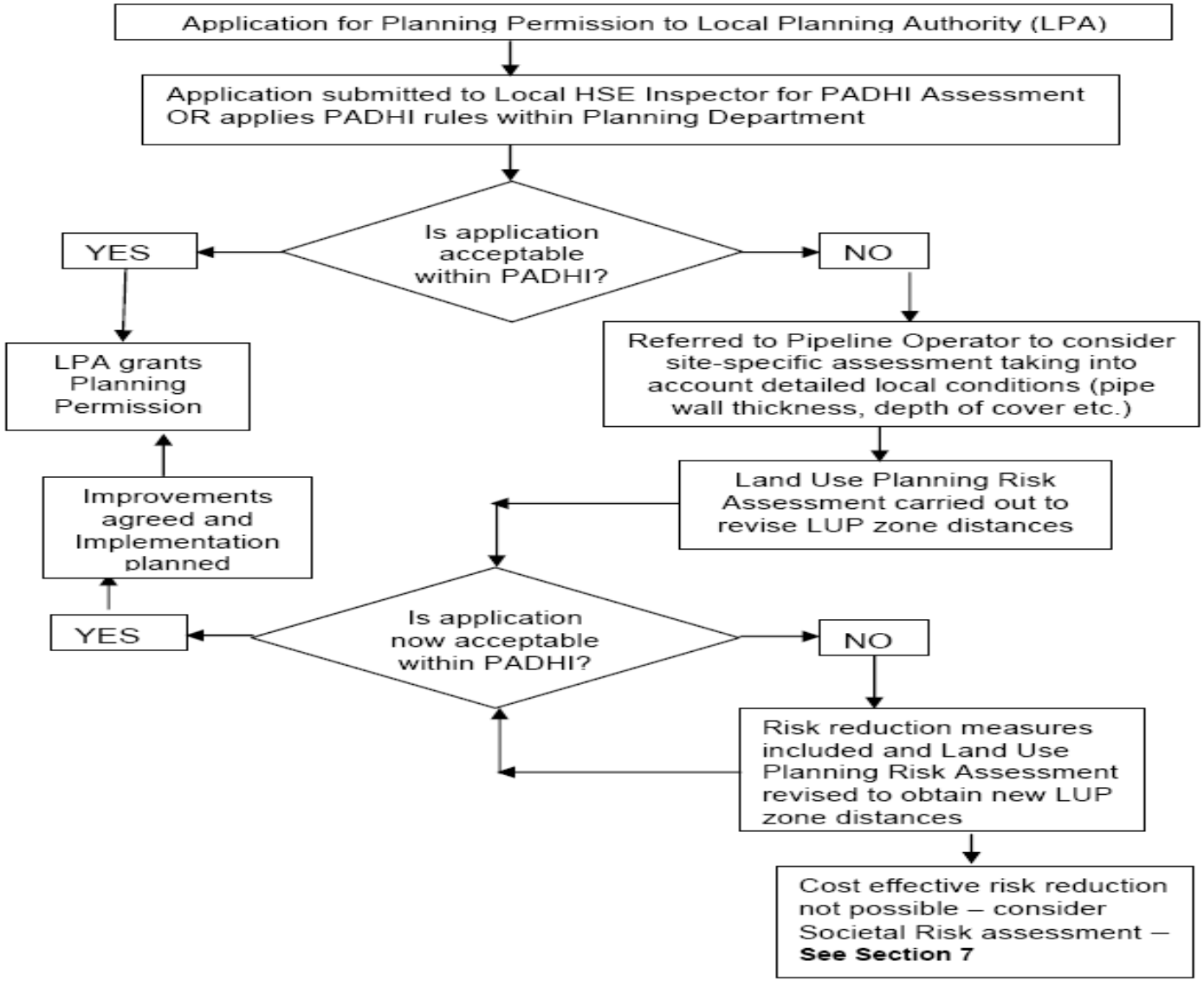
3 Probability of Failure and Failure Frequencies for UK Pipelines

4 Worked Examples

5 Recommended Benchmark Solutions

Scope

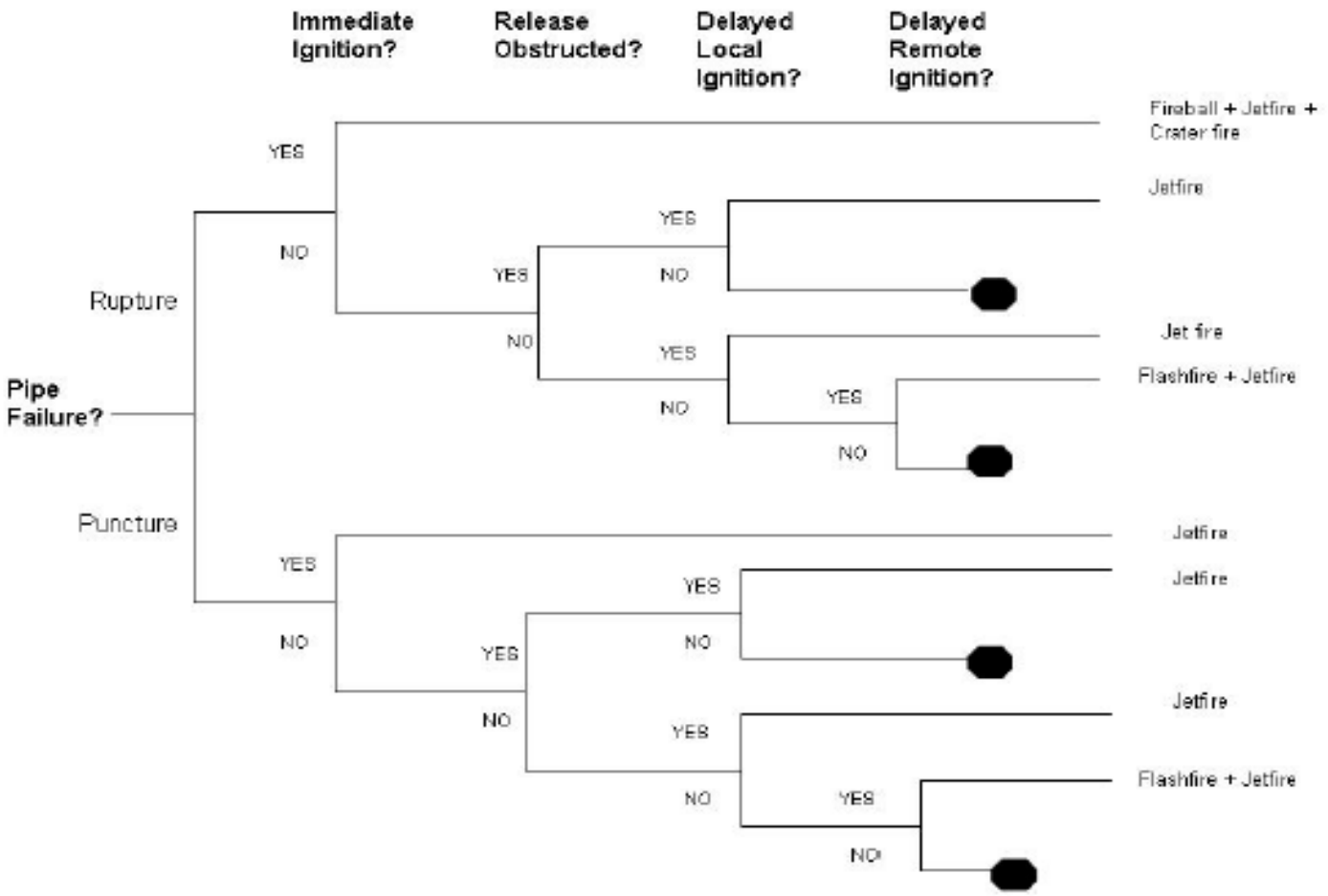
FIGURE 1 – PLANNING APPLICATION PROCESS AND NEED FOR SITE SPECIFIC RISK ASSESSMENT



2 Special Aspects of Risk Assessment Applied to Land Use Planning

- Risk Based LUP Zones
- Consequence (injury/fatality) criteria
- Definition of Inner zone
- PADHI (HSE Methodology – Planning And Developments in the vicinity of Hazardous Installations)

3 Requirements for Risk Assessment of Pipelines



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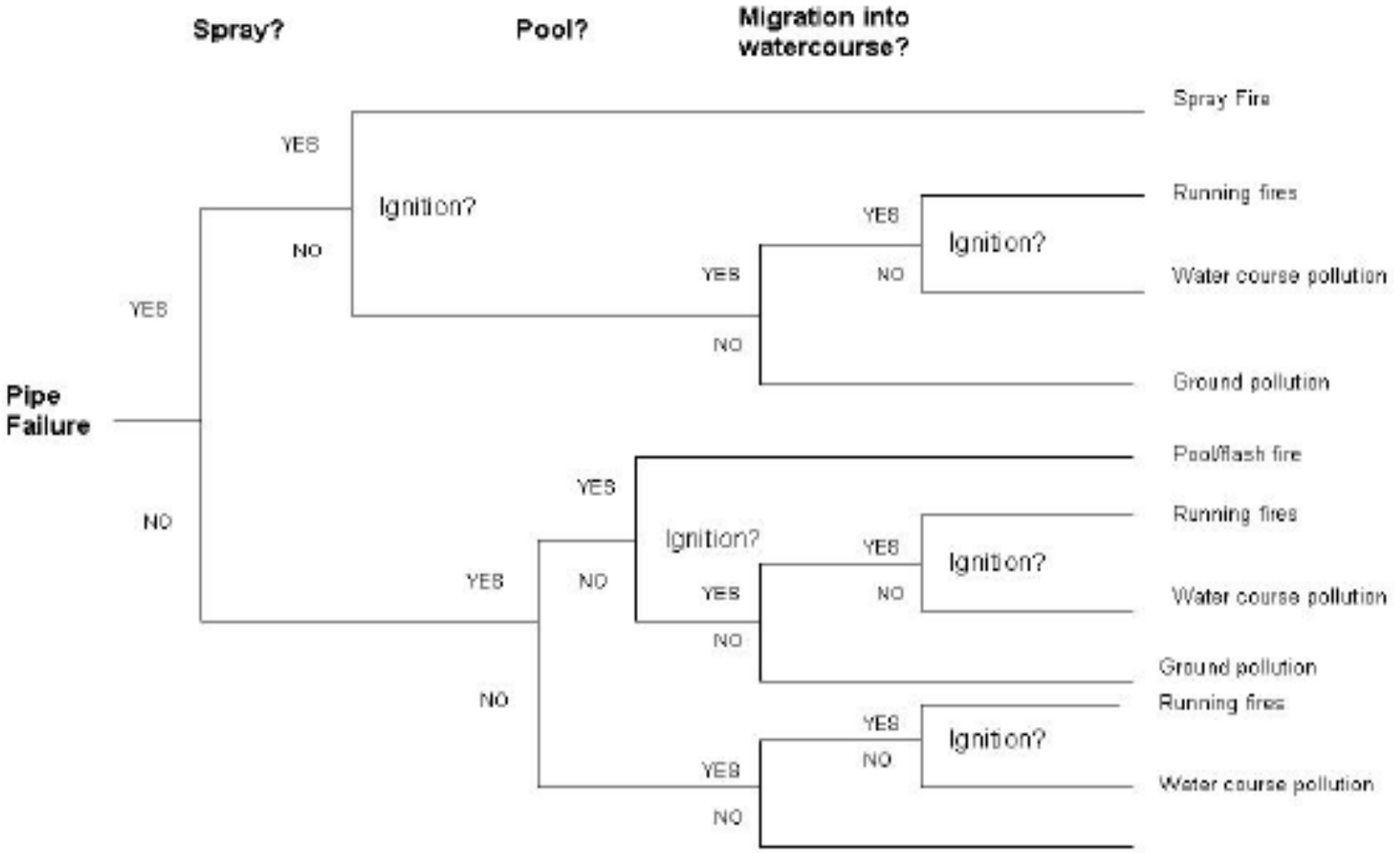

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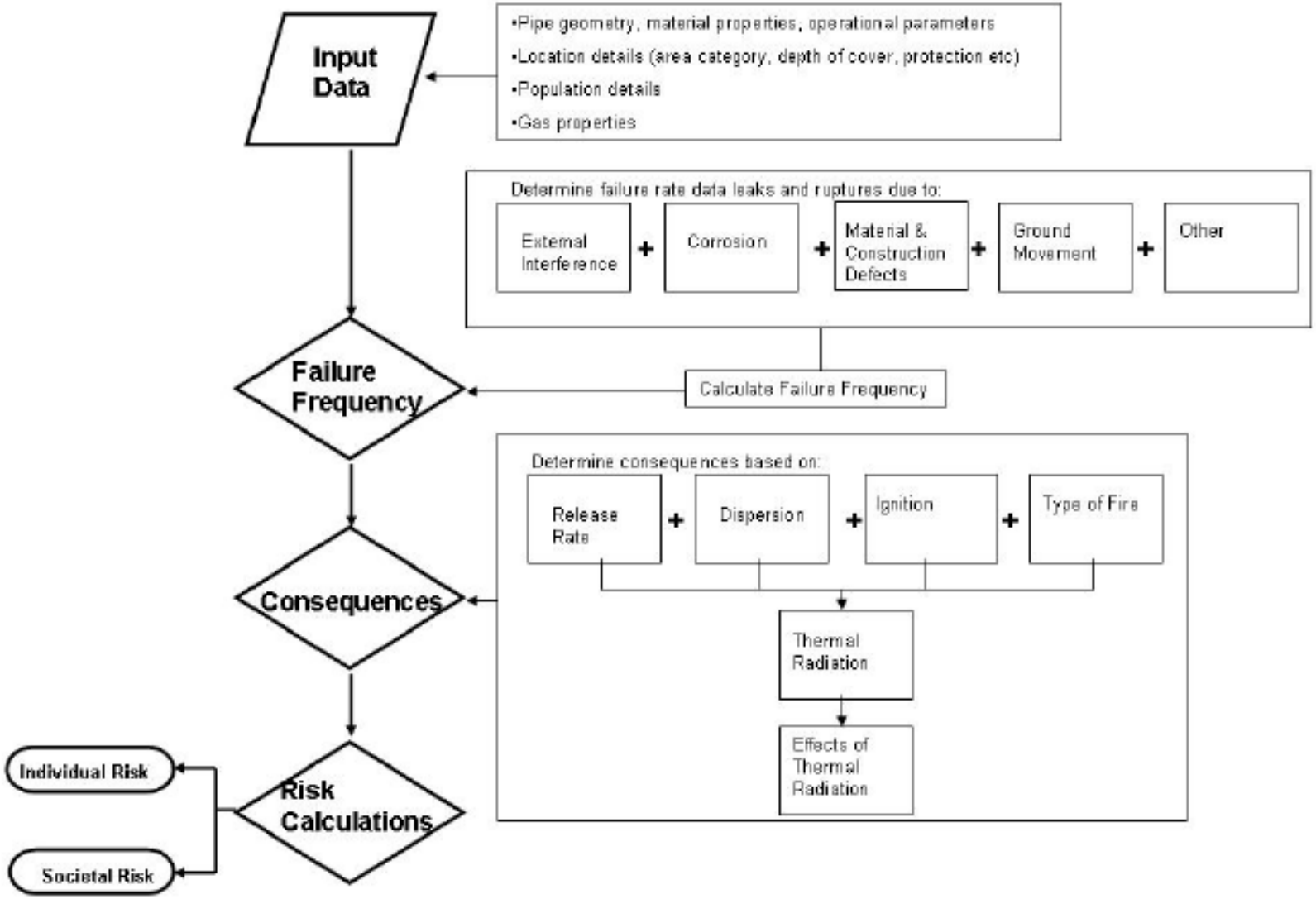
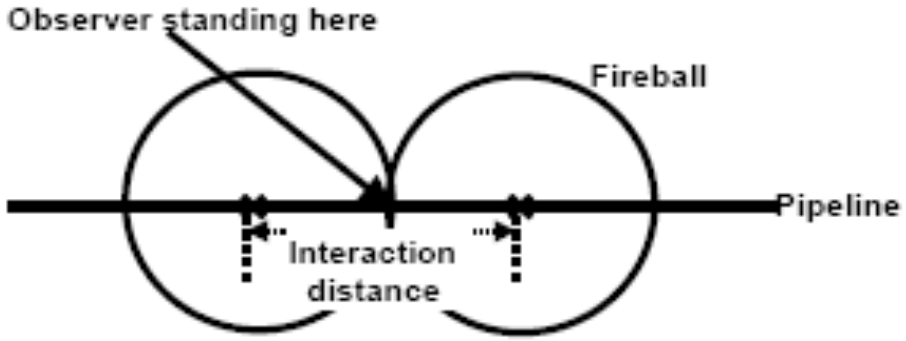


4 Failure of Major Accident Hazard Pipelines

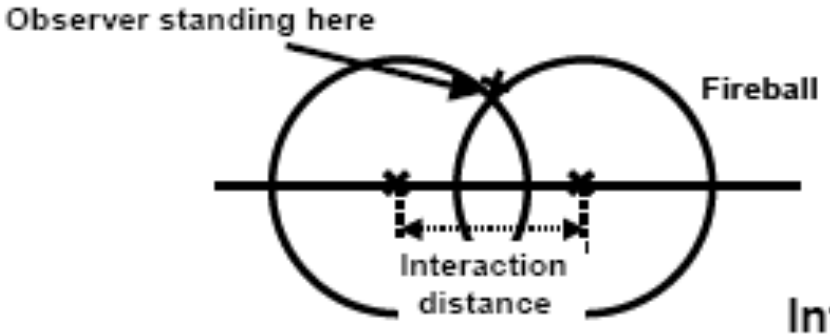
- 4.1 Prediction of Failure Frequency
- 4.2 Prediction of Consequences
- 4.3 Probability of Ignition
- 4.4 Consequences
- 4.5 Thermal Radiation
- 4.6 Effects of Thermal Radiation

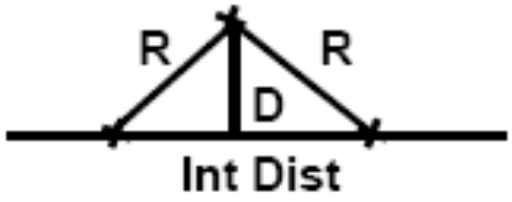
5 Calculation of Individual Risk

Calculation of Pipeline Length affecting an individual in the vicinity of a Pipeline



Interaction distance = 2 x radius of circle
= length of pipeline which could affect you





Interaction distance = $2 \times \sqrt{(R^2-D^2)}$

6 Definition of Extent of the Site-Specific Risk Assessment Required for Land Use Planning Assessments

- 6.1 Pipeline Failure Mode
- 6.2 Failure Frequency Reduction Factors for Use in Site-Specific LUP Assessments
- 6.3 Implementation of Risk Reduction

6 Definition of Extent of the Site-Specific Risk Assessment Required for Land Use Planning Assessments

Figure 5: Reduction in External Interference Failure Frequency Due to Design Factor

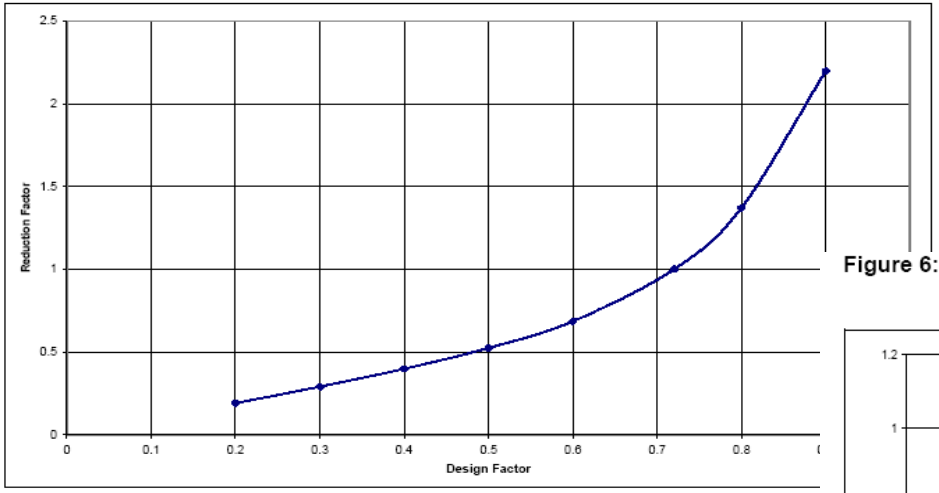
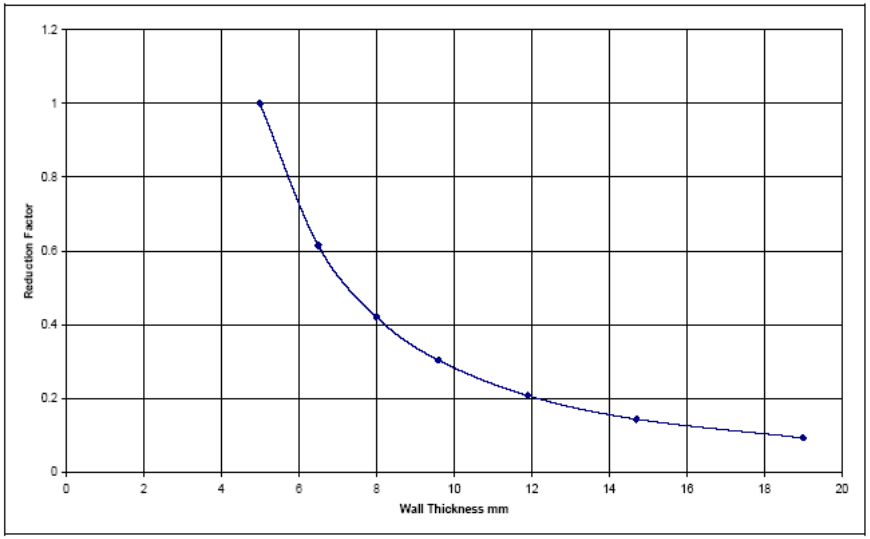


Figure 6: Reduction in External Interference Failure Frequency Due to Wall Thickness



6 Definition of Extent of the Site-Specific Risk Assessment Required for Land Use Planning Assessments

Figure 7: Reduction in External Interference Failure Frequency Due to Depth of Cover

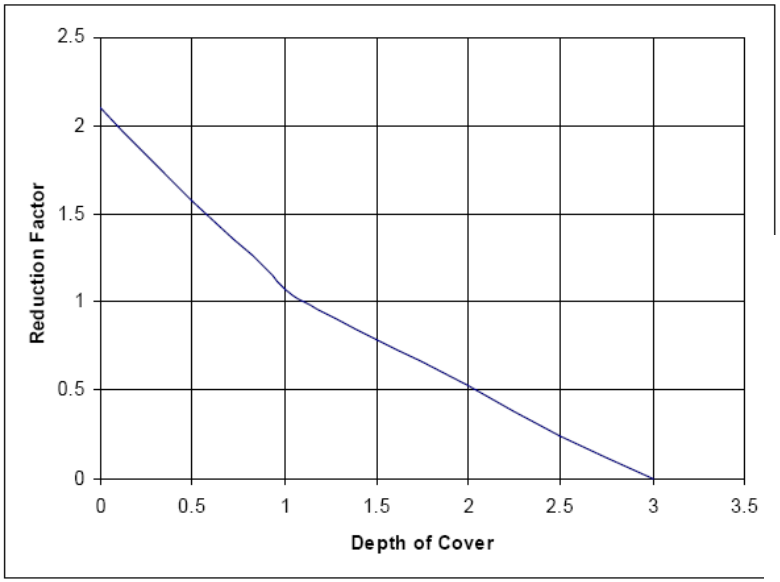
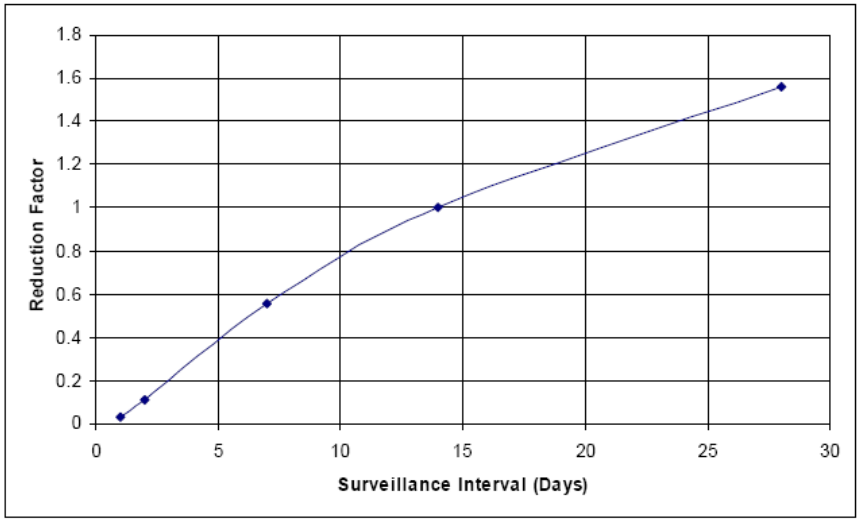


Figure 8: Reduction in External Interference Failure Frequency Due to Surveillance Frequency

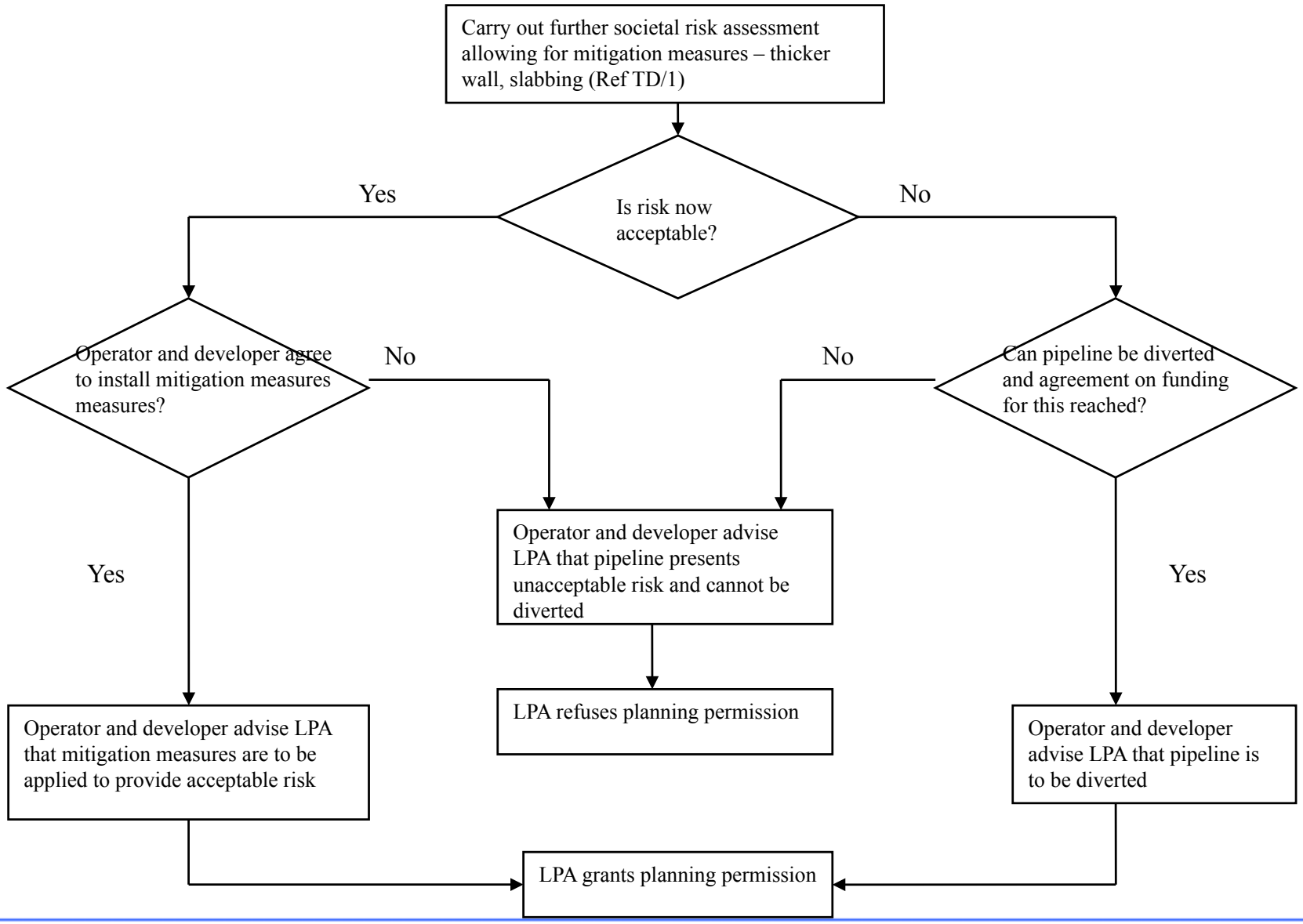


6 Definition of Extent of the Site-Specific Risk Assessment Required for Land Use Planning Assessments

Table 1 – Risk Reduction Factors for Additional measures

Measure	Risk Reduction Factor
High visibility markers	0.85
Additional liaison visits per year	0.9
Installation of concrete slab protection	0.4
Installation of concrete slab protection plus visible warning	0.1

7 Societal Risk



Programme for Completion of Code Supplements

ID	Task Name	Duration	Start
1	**IGEM and BSI Code Supplements**	150 days	Wed 28/12/05
2	Jet Fire Discussion with the HSE	3 days	Wed 28/12/05
3	Develop BPDs for Non Gas Pipelines	10 days	Mon 06/03/06
4	Corrosion Failure Rate for Ethylene	10 days	Mon 06/03/06
5	Failure Rates for small diameter pipelines	3 days	Mon 06/03/06
6	F-N Curves for Non Gas Pipelines	3 days	Mon 20/02/06
7	Failure Rates due to mechanical and construction	1 day	Mon 20/03/06
8	Prepare final drafts of supplements	11 days	Fri 17/02/06
9	Identify and Action Gaps and issue to RAWG	2 days	Mon 13/03/06
10	RAWG Approval	1 day	Wed 22/03/06
11	Meetings with IGEM and BSI	4 days	Mon 27/03/06
12	Public Consultation	60 days	Mon 03/04/06
13	Review public comments and prepare proposals	4 days	Mon 26/06/06
14	Meetings with IGEM and BSI to review proposals	4 days	Mon 03/07/06
15	Prepare final versions of supplements	6 days	Mon 10/07/06
16	Publish final supplements	5 days	Tue 18/07/06
17	Develop and write ethylene RA methodology	5 days	Mon 03/04/06
18	Develop and write NGL RA methodology	5 days	Mon 10/04/06
19	Develop and write crude oil RA methodology	5 days	Mon 17/04/06
20			
21	**Additional Activities**	179 days	Tue 17/01/06
22	Attendance at UKOPA Meetings	12 days	Tue 17/01/06
23	Prepare for May RA Workshop - Date tbc	4 days	Mon 08/05/06
24	Attendance at Final Meeting of WGP - Dates tbc	1 day?	Tue 03/01/06
25	Attendance at RAWG Meetings -Dates tbc	1 day?	Tue 03/01/06
26	UKOPA Safety Seminar -Date tbc	1 day?	Tue 03/01/06