

## **RISK ASSESSMENT WORK GROUP - 9 September 2004**

### **Technical Work Programme Progress Report**

#### **1 Progress to Date**

The Technical Work Programme has progressed less quickly than expected due to several changes, not least the effort required on urgent aspects such as gasoline pipelines, and HSE's reluctance to dedicate resources to pipeline risk development work. However, there is now support from a senior level in HSE to use "complementary systems and a common core of data" for pipeline risk assessments.

Recent involvement with the HSE's Land Use Planning Project P5 meetings has exposed the weaknesses in many areas of pipeline risk assessment methodologies which now need to be updated and revised to enable HSE to continue to give credible LUP advice. Many of these areas of development coincide with the UKOPA / WGP Programme of Technical Work which were proposed and agreed during 2003.

It has also emerged that, while continued joint working, co-operation and lobbying should eventually succeed in updating these models and techniques, it is likely that in future HSE will refer Local Authorities and planners to pipeline operators as the source of expert advice with regard to Land Use Planning.

Therefore, the primary aspirations of the RAWG are to:-

- i) Work jointly with the Regulatory Authorities to develop better techniques, methodologies and to debate and understand the main assumptions applied to pipeline risk assessments, and
- ii) Develop an agreed and codified approach for use by pipeline operators based on i).

The desired outcome is to eliminate technical disputes between methods, so that a common understanding of the results as applied to Land Use Planning zones can be achieved.

#### **2 The Next Phase**

The results from the P5 series of meeting have yet to be made public; these are very important for UKOPA. A meeting of the HSE Project Directorate is scheduled for week commencing 13 September to consider a paper by Linda Murray and Richard Thomas outlining the recommendations for further development from P5. Further involvement of the Working Group on Pipelines (WGP) is promised for the next part of the project, P6, which will consider the risk assessment development priorities.

If pipeline risk assessment is declared by HSE to be a high priority for update and improvement, the WGP / RAWG have an ideal opportunity to become closely involved with improvements in methodology. UKOPA's interest in becoming involved in Joint Industry Projects for developing pipeline risk assessment methodologies was clearly recorded in the P5 reporting process. If P5 does not register pipeline risk assessment as a high priority, WGP / RAWG will need to continue to develop and fund the required improvements, while lobbying and maintaining the interest of those in HSE who can make the necessary changes to their methodology.

In addition, further development of the risk assessment methodology for the UK Code of Practice for Onshore Pipelines PD 8010 will provide a powerful process for establishing key methodologies in the public domain for use by HSE and pipeline operators.

In either case, an ongoing plan of action is required to continue progress with the work. A draft is attached below which describes the further stages and milestones in achieving the required objectives.

The recent pipeline accident in Belgium brings the European Pipeline Safety Instrument and possible future European Directive into sharper focus. In particular, the 1998 studies (UKOPA 98/0038) carried out by TNO in Holland to define the risks from various pipelines requires close scrutiny to examine how environmental risks will impact any future changes to UK legislation.

### **3 Specific Aspects of the Technical Work Programme**

#### **3.1 Failure Rate Contribution from Ground Movement.**

The British Geological Survey have completed this work, and Transco are evaluating the results to see how they can be incorporated into the Risk Assessment modelling for Land Use Planning Zones. The time-scale for these developments is the next 2 years.

#### **3.2 Third Party Damage Predictive Model.**

Advantica have completed work to develop Limit State Functions for UKOPA. Results to be evaluated to see how this will impact on Predictive Modelling. Work is being managed / co-ordinated by Transco. Decisions will be required in due course as to what further work is required to incorporate the new Limit State Functions into a new set of computer models. Recalculation of LUP zones and codification for inclusion in BS PD 8010 will be required.

#### **3.3 Mitigation – Risk Reduction Factors for Physical Protection of Pipelines.**

An initial Fault Tree analysis paper has been produced for the risk reduction achieved by slabbing and marker tape. This requires updating, followed by a process of peer review and discussion with HSE. Risk reduction factors for review, agreement, and inclusion in PD 8010 will be developed. Further mitigation methods are being reviewed. (PIPESAFE group)

#### **3.4 Ethylene Pipelines – Revision of LUP zones.**

The original HSE risk assessment of ethylene pipelines requires considerable re-working to incorporate many aspects of development, part of which is established in the updated methods (UKOPA Leak Database, MISHAP), and part of which requires review of key underlying assumptions (source of ignition probability, flash fire modelling, jet fire modelling). Detailed consideration of all these factors with HSE is required to allow revised LUP zones to be established and codified for inclusion in BS PD 8010.

### **3.5 Spiked Crude – Revision of LUP zones .**

Atkins have produced a report on HSE's methodology for spiked crude and suggested areas where the methods are over-cautious. The original LUP zones were set using PRAM which is now not longer available. Detailed study of the report is required to allow revised LUP zones to be established and codified for inclusion in BS PD 8010.

### **3.6 Gasoline Pipeline Risk Assessment.**

Although the urgency for establishing risk zones has gone now that PSR changes are no longer to be progressed, the work initiated to establish pipeline failure rates based on CONCAWE data, and a rational approach for setting an inner zone should be completed. HSE (Steve Porter) have agreed to file work completed by UKOPA for future reference should it arise again.

### **3.7 Environmental Risk Assessment**

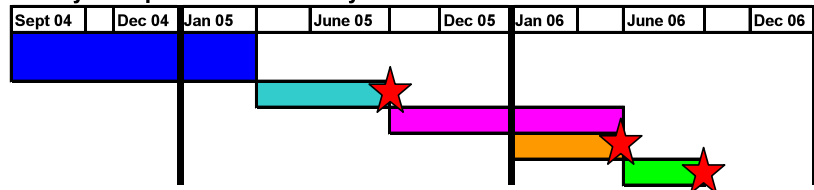
With the possibility of the European Pipeline Directive being progressed in the foreseeable future, a review is proposed of the likely environmental risk assessment approach which might be applied based on the previous work done by TNO (UKOPA 98/0038).

R A McConnell  
9 September 2004

## UKOPA Risk Assessment Work Group - Plan for Technical Work Programme Simplified GANT Chart

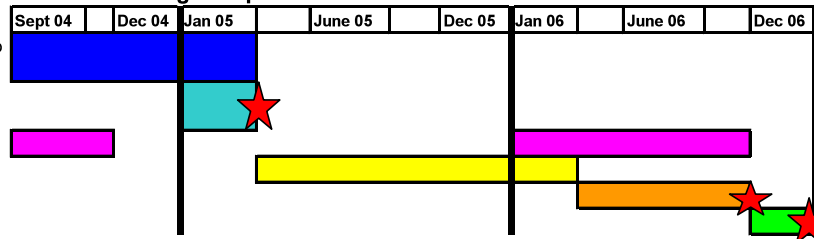
### Activity 1 - Transco-BGS work to classify Group Movement Risk by Areas

- 1 Define how BGS work can be incorporated into risk assessments
- 2 Define methodology
- 3 Detailed discussions with HSE
- 4 Decide which LUPs need to change
- 5 Make changes to LUPs thro' PADHI



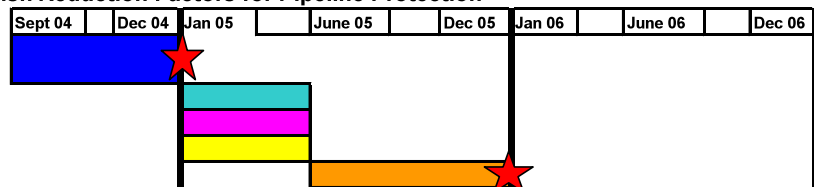
### Activity 2 - Revise and Update Predictive Modelling of Pipeline Failure Rates

- 1 Assimilate results of Advantica work to revise Limit State Functions
- 2 Decide whether to proceed with developing revised software
- 3 Detailed discussions with HSE
- 4 Contract to develop new software
- 5 Decide which LUPs need to change
- 6 Make changes to LUPs thro' PADHI



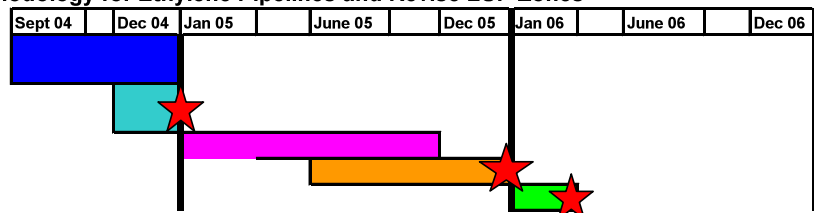
### Activity 3 - Establish Mitigation Risk Reduction Factors for Pipeline Protection

- 1 Review / revise Fault Tree analysis draft paper ready for issue
- 2 Peer review for publication
- 3 Discuss with HSE
- 4 Discuss with PIPESAFE Group
- 5 Publish paper on Mitigation



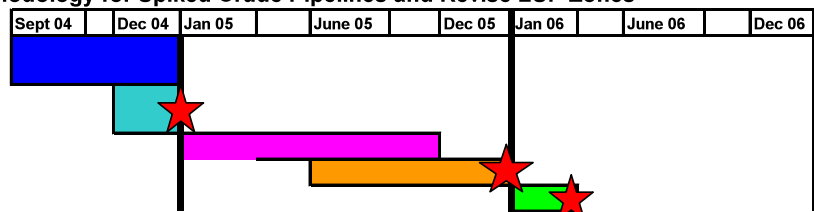
### Activity 4 - Develop Updated Methodology for Ethylene Pipelines and Revise LUP Zones

- 1 Develop current thinking on assumptions for models
- 2 Re-calculate typical LUP zones using revised methodologies
- 3 Detailed discussions with HSE
- 4 Gain agreement to recalculate LUPs
- 5 Make changes to LUPs thro' PADHI



### Activity 5 - Develop Updated Methodology for Spiked Crude Pipelines and Revise LUP Zones

- 1 Review proposed revisions to HSE approach made by Atkins
- 2 Re-calculate typical LUP zones using revised methodology
- 3 Detailed discussions with HSE
- 4 Gain agreement to recalculate LUPs
- 5 Make changes to LUPs thro' PADHI



### Activity 6 - Establish Gasoline Failure Frequency and Review EC Directive (Environmental) Impact

- 1 Discussions with CONCAWE to review failure frequency
- 2 Discussions with pd 8010 - origin of substance factors for BPDs and how these might impact gasoline
- 3 Write paper to lodge with HSE for future reference
- 4 Ongoing review of EC PSI and risk assessments - environmental impact methodologies

