

## HSE Response to Issues Raised in UKOPA letter to SPD of 29 October 2002

The comments below refer to the issues raised in the Annex to the above letter and are intended to be used both at the MHSC meeting on 31<sup>st</sup> October and, if required in responding to the UKOPA letter.

### 1. Natural Failures

The points raised in the letter are an accurate reflection of the position. However, the frequency HSE is proposing to adopt is that derived from UKOPA's own data and is the best currently available. Whilst HSE agree that this failure cause will be predominantly dependent on the location of a particular section of pipeline and that, as a consequence, the 'true' failure frequency for many pipelines may be significantly less than the value derived from historical data, there is no current technique that allows this to be taken into account. The approach being developed by Transco, The British Geological Survey and Advantica may well deliver a viable alternative but there is no guarantee, neither of success, nor of the time required to develop a suitable solution.

The group of pipelines on which this issue has greatest impact is those classified as 'suburban'. For these pipelines current HSE policy, which is based on the information contained in the industry guidance IGE/TD/1, assumes that rupture cannot occur. In the move to a risk based policy such an assumption can only be supported if it can be shown that the likelihood of such failures is so low as to result in a negligible level of risk. In the case of Natural failures it is accepted that the 'true' failure frequency of rupture for the majority of pipelines may well be lower than the currently proposed value but there is no evidence to support a view that it will be negligible. In these circumstances HSE must take a precautionary approach and adopt a figure based on the best available data.

A further, practical, issue is that HSE can only set Consultation Zones on the basis of the information the operator is legally required to provide under the Pipeline Safety Regulations. This information does not currently include any reference to susceptibility to landslip or earthquake and, even if this information were required, it would be likely to vary significantly along the length of the pipeline. HSE do recognise the problem of variability along a pipeline and the system proposed does allow a developer to submit more detailed information (for example on a section with thick walled pipe) for re-assessment by MSDU in the event that a planning application is refused. Once the methodology has been agreed the issue of Natural failure frequency could be dealt with by the same approach.

### 2. Area Classification

HSE determines the area classification of a pipeline on the basis of its Design Factor and the requirements in IGE/TD/1 relating Design Factor to the two location categories. That is, where a pipeline's notified parameters result in a Design Factor of less than 0.3 it will be classified as suburban.

Clearly, the population density along a specific pipeline will vary and may result in some sections being suburban areas whilst others are in rural. HSE can only classify on the basis of the notified parameters which do not include population density, hence the use of Design Factor. An additional complication is that over the life of a pipeline the population density in areas adjacent to it will, inevitably, change so unless this was kept under constant review and re-classification carried out as necessary any classification based on population density would, over time, become invalid.

### 3. Third Party Model

It is true that there are differences between the HSE and Transco models for predicting Third Party Activity failure frequencies. However, whilst there is a **general trend** of increasing divergence with reducing Design Factor (or stress level) this is by no means a universal phenomenon. HSE has been unable to identify a consistent pattern of divergence; for example the differences become most significant in suburban class pipelines, with Design Factors below 0.3, yet within this group there are many pipelines where relatively good agreement is obtained between the two models and these areas of good agreement are interspersed between areas of poor agreement when ordered by stress level. This leads to a view, expressed by Advantica, that the HSE model might be unstable at low Design Factors. HSE has carried out extensive work with its model to test this hypothesis and found no evidence to suggest that it is unstable at any set of pipeline parameters. This conclusion was reached by running the model for a range of pressures (covering the extremes of the NTS operating pressures) at each combination of pipeline diameter, wall thickness and material grade. The resulting failure frequencies were then plotted against pressure (effectively against Design Factor or stress), the resultant plots, in all cases, showed a smooth reduction in failure frequency as pressure decreased with no indication of any instability. Earlier in the project similar plots had been produced for the variation in failure frequency with both wall thickness and pipe diameter, again the trends were as expected.

Whilst there is undoubtedly a need to understand why the two models, in some circumstances produce widely differing results, HSE believes it has done sufficient work to have confidence that its model is producing consistent and realistic results. As regulator it is incumbent on HSE to adopt a cautious approach in cases such as this, particularly where there is no reason to believe that the HSE model is introducing excessive conservatism. Further progress in identifying the causes of the differing results is likely to require a detailed examination of the fundamental structural integrity equations at the heart of each model, which would take some time to complete.