

June 19, 2006

Dear Councillor Haszeldine,

Pedestrian Heart Gas Main Review

As discussed at the Pedestrian Heart Gas Main Review meeting on Friday, here is a brief non-technical description of how we “score” the metallic pipes within our network in terms of their need for replacement.

Northern Gas Networks, in common with all gas distribution companies in the UK, has a tightly-monitored programme to replace all its metal gas pipes within 30m of buildings over the next 25 years.

To ensure we renew the most needy pipes first, we use a scoring system known as the Mains Risk Prioritisation Scheme (MRPS), to rank each individual pipe section in terms of the likely risk of an incident.

I would like to say at this point that the safety record of our network is extremely good and serious incidents are rare.

Like our mains replacement programme, the MPRS scoring system is approved and agreed by the Health and Safety Executive (HSE), and forms part of our Safety Case.

Developed between 1997 and 1999, the MPRS is a risk assessment model. It was first used by Transco with the agreement of the HSE in 2000 and has undergone several updates since then.

Using the MRPS we can rank every individual pipe section in our network in order of risk. This means we can be sure we replace the pipes which are most in need first.

When we talk about risk we are really talking about the likelihood of an explosion. Three things must happen to cause an explosion – gas must leak, it must then enter a property, it must then be ignited. Our risk model is therefore based on these three factors: mains fracture/corrosion, gas ingress and incident consequence.

The risk assessment model takes the form:

$$RISK = MFF \times GIF \times GHF \times CF$$

Where:

MFF = Mains Fracture Factor

GIF = Gas Ingress Factor

GHF = Gas History Factor

CF = Consequence Factor

...continued

Below is some more detail on all of the factors, should you require it.

Mains Fracture Factor

This helps us predict the likelihood of a fracture occurring on a given piece of pipe in the coming year. It depends on:

- The pipe's fracture history
- The fracture history of other mains nearby
- The size of the main

Gas Ingress Factor

This helps us predict whether, if gas escapes from the main in question, it is likely to get into nearby properties. It depends on:

- The size of the main
- How much of it is close to buildings.
- How much of it has less than 2 metres of "open ground" (e.g. grass verge) between the main and nearby properties.
- How many adjacent buildings have cellars.

Gas History Factor

This is a further scaling factor which allows us to rank pipes where previous leaks have led to gas in buildings.

Consequence Factor

This helps us predict the probability of an incident, should gas get into a building. The CF is different for different pipe pressures: Low or medium pressure.

As you can see, the age of a pipe does not directly affect its score.

The scores for each individual pipe are updated dynamically whenever there is a change to any of the circumstances above, and a fresh system extract is taken on an annual basis to allow us to generate the following year's workload.

As discussed at the meeting, the score of the pipe affected by the Pedestrian Heart scheme was so low that the pipe would not have been considered for replacement until towards the end of our mains replacement programme in about 24 years time.

I trust that this brief note explains the basis for the way that pipes are prioritised for replacement, but if I can be of any further assistance please do not hesitate to get in touch.

Yours sincerely

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