25 April 2008

Dear Mr McNaughton,

Evidence for the Proposed Domestic Fire Safety LCO Committee on the proposed "National Assembly for Wales (Legislative Competance) (No.7) Order 2008, relating to fire sprinkler systems in new residential premises"

Dwr Cymru Welsh Water is most grateful to be invited by Huw Lewis AM in his letter dated 19 March 2008 to submit evidence to his Committee relating to fire sprinkler systems in new residential premises.

It is emphasized that Dwr Cymru Welsh Water is waiting for the completion of national debates on policies and specifications and the subsequent recommendations by Water UK and the Water Regulations Advisory Scheme (WRAS) before producing its own final policy. Hence the information below incorporates our understanding of the current position of these debates and our thoughts on the way forward.

With particular reference to the three questions in his letter we would comment as follows:-

1. We do not feel that it is appropriate for this company to comment on Question 1

2. We consider that Matter 11.1 needs greater definition.

3. "a sprinkler system". It should be defined as a sprinkler system designed to comply at all times of the day and year with BS 9251:2005; any subsequent amendments or equivalent superseding British Standard and any other relevant British Standard; "and the design should also take into account expected changes that might prejudice compliance." (see notes below on pressure management development which supports the italics)

4. "new residential premises". This needs clear definition to avoid confusion. Does it include everywhere people reside temporarily or permanently eg hotels; guest houses; hostels; university halls of residence; prisons? Does it include the whole of a building if only part of it is used as a residence eg a public house where the landlord's family lives on the premise and a shop with a flat above. Does it include mobile homes (many of which are merely prefabricated homes without wheels)? Does it apply to the many rural premises that will only have a private source of water supply, often with little pressure and flow?

5. The definitions given in Matter 11.1 in sections (b),(c) and (d) are vital to understanding the intended meaning of "new residential premises" and "sprinkler systems" but as stated in (2) above they need further expansion to avoid confusion.

In drafting the order the Committee need to be aware of a number of matters which will need to be specified and a number of technical challenges that will frequently be encountered when designing sprinkler installations and the significant costs that may result in order to deal with them. The following evidence is an effort to summarize those challenges for the benefit of the Committee.

First of all Dwr Cymru Welsh Water accepts that the installation of fire sprinkler systems in residential premises on a large scale will result in the reduction in deaths due to fires at those premises and wants to give all the support it can to their installation. However the costs of providing a water supply with the necessary flow and pressure at each sprinkler head, additional to those for the domestic supply, should not be underestimated, and it is recommended that detailed studies of those costs should be carried out and considered before legislation is approved. It appears likely to this company that there will be a large number of properties where these costs could be significantly higher than the costs included in paragraph 32 of the Explanatory Memorandum.

The Committee will no doubt be aware that BS 9251: 2005 "Sprinkler Systems for Residential and Domestic Occupancies Code of Practice has separate definitions for Residential and Domestic occupancies and it is assumed that the order relates to both of these.

Specification Standard

1. We would hope and expect compliance with BS 9251:2005. This is a requirement of the draft Terms and Conditions issued by Water UK as a template for water undertakers to prepare their own Terms & Conditions.

2. A design compliant with BS 9251:2005 would be expected to be compliant at all times of the day and year and even take into account expected changes that might prejudice compliance. This needs to be clearly stated in the Order since some existing and proposed sprinkler systems are less resilient. It is our concern that our company, and possibly the Assembly, would be accused of negligence in allowing such an installation, particularly if an occupier died in a fire during a period of time that a sprinkler system was designed not to function properly.

Availability of Water

1. The Water Industry Act 1991 defines a supply for a sprinkler system to be a "supply for non-domestic purposes". Such a supply is given on such terms as the water undertaker may agree with the applicant. The Act prevents the supply being given if in doing so it would put at risk the water undertaker's ability to meet all its existing obligations to supply water and its probable future obligations to supply water for domestic purposes. In this event it is likely that mitigating works could be carried out but the costs, which could be prohibitively expensive, would need to be paid by the applicant and there could be a considerable delay to the supply being made available. In such a situation the use of storage instead of a direct supply is likely to be the optimum solution.

2. Whilst the water company would make no charge for any water used during a fire or for testing purposes it seems likely that an annual charge would need to be levied on the customer for maintenance and management of the water company apparatus relating to

the sprinkler.

3. It is not expected that there will normally be any problem supplying a domestic premise with the necessary flow of 109 litres/minute (l/min) unless the existing or planned water main is only 50mm bore, but these are very few in number. The necessary flow of 218 l/min to residential premises will present a more frequent problem which might result in a proposed main and some existing mains being upsized, which might be very expensive. The relevant costs would need to be charged to the water supply applicant and there may be a delay in making the water supply available. These costs could however be avoided if storage was provided at the premise that could be filled slowly.

4. Whilst it might be possible to supply 109 and 218 l/min to a premise it needs to be appreciated that this would have a significant effect on the construction work to make the new connection, particularly when connections are being made to existing mains. The current standard connection to a single dwelling is with a 20mm bore pipe which can be made quite quickly without shutting down the main. In order to take 109 l/min from the main with manageable pressure losses it is likely that a 41 mm bore pipe and connection to the main will be needed, involving a shut down on some diameters and types of main. This will greatly increase the cost of a house connection, particularly if a water main shutdown is required and work will take longer resulting in longer disruption of road traffic. If water supply shut off's become a common occurrence this will not be popular with customers. A residential premise requiring 218 l/min will probably require a 52mm bore pipe which will be even more expensive.

Pressure Availability

1. When unmanaged, the pressure in a water main can vary considerably in a 24 hour period; from season to season and when short, but possibly infrequent, high abstractions are taken from the main nearby. The Water Industry Act 1991 requires that water supplied for domestic purposes should merely have sufficient pressure to reach the top storey of the premise. The Regulator (ofwat) additionally requires that water undertakers report the number of properties that are likely to receive pressures below 1 bar (10 metres) with a flow of 9 litres/min. This is the pressure most water undertakers aim for in order to maximize efficiency and therefore will govern the pressure at the non-domestic (sprinkler system) supply point. It will be noted that this is well below the 3.5 bar (35m) that Dwr Cymru Welsh Water consider will be necessary to operate a sprinkler system without a pressure boosting pump.

2. However there are many kilometres of water main, particularly in hilly areas where the pressure is and always will be, greater than 3.5 bar and a pump would not be necessary for an efficiently designed sprinkler system.

3. But there are also many kilometres which for most of the time have in excess of 3.5 bar but for perhaps one or two hours each day, at peak demand times, the pressure will reduce to a lower value, often less than 2 bar. Many of these and other mains will have longer and even lower pressures in drought periods.

4. In order to make the supply of water more efficient by reducing leakage and general consumption, pressure management is extensively applied across our distribution systems. Pressure in these mains is managed to generally between 15 and 25 metres head; which will require a pump to be fitted to most sprinkler systems in those areas. This has greatly contributed to Dwr Cymru Welsh Water (DCWW) reducing its leakage by 50% since 1995. Pressure management will continue to spread over an increasing length of mains.

Water Meter

1. A key component of the 3.5bar pressure that will be needed is due to a pressure loss of approximately 1bar (10 m) because of the need to fit a small diameter water meter on the sprinkler supply pipe. Though no charge can be made for water used for fire fighting purposes or for testing the apparatus, DCWW needs to fit a water meter to detect any leakage or theft of water. An appropriately sized meter (15mm) would not allow the necessary flows to the sprinkler systems but it is hoped that a 20mm meter would be an acceptable compromise. A 20mm meter will not detect such low flows as a 15mm meter but investigations will be carried out in the hope that the low flows detected by the 20mm meter will adequate. This would hopefully avoid the need to install an adequately sized storage tank (840 litres for a domestic premise and 5040 litres for a residential premise) which could be fed slowly from the domestic supply pipe before being pumped from the tank into the sprinkler system.

Maintenance

1. It is extremely important that any pump and the sprinkler system are regularly maintained if they are to work properly when needed and are kept completely isolated from the potable supply system. As water within the sprinkler plumbing may never be used it will become stagnant and deteriorate and could give rise to serious ill health if cross connected to the potable supply system or if the necessary backflow prevention devices malfunction. Serious consideration needs to be given how to ensure that this maintenance will be carried out regularly by householders who cannot afford or understand the importance of maintenance.

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