Dŵr Cymru
Welsh Water

Rosemary Butler AM
Chair of Legislative Committee No. 1
Domestic Fire Safety (Wales) Measure
National Assembly for Wales
Cardiff Bay
CF99 1NA

Dwr Cymru Welsh Water
Pentwyn Road
Nelson
Treharris
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Dear Ms Butler,

30 September 2010

Evidence by Keith Pratley on behalf of Dwr Cymru Welsh Water to the National Assembly for Wales' Committee No. 1 on the general principles of the proposed Domestic Fire Safety (Wales) Measure

Dwr Cymru Welsh Water (DCWW) is most grateful to be invited by your letter dated 15 July 2010 to submit evidence to your Committee on the Domestic Fire Safety (Wales) Measure.

With particular reference to the questions listed in Annex A of your letter we would comment as follows:-

Q1. We do not feel that it is appropriate for this company to comment on Question 1.

Q2. (a) It is noted that because the current stock of housing is 1,338,490 and the annual number of new or converted dwellings is reasonably assumed to be 10,000 it will be 13 years before 10% of the housing stock have sprinkler systems. Hence because an average of only 18 people lose their lives to fire in dwellings each year it is going to be a considerable number of years before a noticeable reduction occurs, though a reduction of the much larger number of injuries should be seen sooner.

(b) Ideally the developer should provide for the sprinkler system a storage tank with a pump that can be filled from the domestic supply pipe. If not then a new dwelling will require a communication pipe larger than currently laid plus many extra fittings in the pavement to allow a sprinkler supply to be given as well as a domestic supply. A separate supply for the sprinkler system that avoids going through the domestic water meter is essential. The developer will also need to provide a backflow prevention valve in the sprinkler supply pipe.
For the conversion of an existing building new or additional communication pipes may be required as well as the provision for each dwelling separate domestic and sprinkler supplies.

It should be noted that a few dwellings are built and connected to private sources of water and it may need to be made clear whether such premises are included by the Measure.

© Dwr Cymru Welsh Water can ensure a sprinkler installation complies with the Water Industry Act but the Act does not include any provisions that would ensure there is sufficient flow or pressure in the water supplied, or that the sprinkler system has been adequately designed and installed, to ensure that the sprinkler system will operate effectively.

(d) The Assembly needs to ensure that the matters in Sections 4(a), (b) & (c) are properly specified to ensure uniformity of interpretation of the requirements. For example:-
Section 1(4)(a) - BS 9251 is not clear whether the sprinkler system should protect the loft space where an electrical fire is possible.
Section 1(4)(b) - The Dwr Cymru Welsh Water draft terms and conditions require the system to be designed to BS 9251 which is recognized as an acceptable standard. We think it likely that our customers would expect the system to operate effectively 24 hours per day and 365 days per year. However without the installation of a pump at each house by the developer a large proportion of new dwellings will for part of many days, when the overall demand for water is high, receive a water supply with insufficient pressure to operate effectively. This is because the minimum pressure standards required by the Water Act and Ofwat are less than is required by BS 9251 for a sprinkler system to operate effectively. To overcome this problem it will be recommended to each developer that each dwelling has storage and a pump incorporated into its sprinkler system.

Section 1(4)© - BS 9251 is unfortunately not clear whether the loft space should be fitted with sprinklers to perhaps deal with electrical fires. Consideration needs to be given as to whether this should be prescribed.

Sections 3(1) and (2) – It is recommended that at least a summary of the sprinkler system design calculations be deposited with a local authority to demonstrate that there will be sufficient pressure in the water at all the sprinkler heads to comply with the prescribed requirements. The deposit should include the statement from the water company on the minimum pressures likely to be experienced at the property throughout the day and the year unless the design incorporates a tank and a pump so that the system can operate effectively without any water being supplied during operation. Dwr Cymru Welsh Water will probably strongly recommend that the developer pays the company for the installation of a continuous pressure logger for a minimum of 7 days on the main that will supply the dwelling to help improve the accuracy of the water pressure predictions.

(e) Section 4 – The Committee might like to consider whether a "residence" also means
(f) a mobile home
(g) a holiday dwelling/cottage ie a dwelling without planning permission for full time occupation by a single family

Section 6 (1) (d) – Dwr Cymru Welsh Water would like to be included in the consultations on matters relating to 1(4)© and 3(2)(b).

Q3 – Practical Implications of the proposed Measure and potential barriers

<u>Specification Standard</u>

1) We would hope and expect compliance with BS 9251:2005. This is a requirement of the DCWW Draft Terms and Conditions which mirrors one issued by Water UK as a template for water undertakers to prepare their 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.

<u>Availability of Water</u>

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 is possible (but considered unlikely at this stage) 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) (as required by BS 9251) unless the existing or planned water main is only 50mm bore, but these are very few in number and have been laid where the main supplies just a few houses. DCWW will consider laying larger mains where necessary on all new developments but this may not be possible since the resultant low velocity of the normal domestic flow might create water quality problems. 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 and also create water quality problems. 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 and water quality problems could however be avoided if storage was provided at the premise that could be filled slowly from the domestic supply pipe.

4) Whilst it might be possible to supply 109 or 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 Dwr Cymru Welsh Water considers 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.

5) The Committee should appreciate that there will be significant extra time to make a sprinkler connection at the same time as a new domestic connection. As a result there could be increased disruption to traffic and pedestrians, highway authorities and other utilities.

<u>Pressure Availability</u>

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 this will govern the pressure at the non-domestic (sprinkler system) supply point. It will be noted that this is well below the 2.5 bar (25m) that Dwr Cymru Welsh Water considers will be necessary to operate a sprinkler system to a two storey dwelling without a pressure boosting pump and a meter. It is expected by ofwat, and important for several operational reasons, that meters are installed on all new connections. However a sprinkler supply meter will result in undesirable costs and significant pressure losses so in order to encourage the installation of sprinkler systems DCWW currently plan not to require a meter unless the supply is abused.

2) There are many kilometres of water main where new dwellings might be connected, particularly in hilly areas where the pressure is and always will be, greater than 2.5 bar and a pump would not be necessary for an efficiently designed sprinkler system.

3) But there are also many kilometres of main which for most of the time might have in excess of 2.5 bar, but for perhaps one or two hours each day, at peak demand times, the pressure will reduce to a lower value. This can often result, at critical points in the mains network, in the pressure at the supply point being very little above the 1bar ofwat minimum pressure standard. Many of these and other mains will also have longer periods with low pressure during drought periods.

4) In order to make the supply of water more efficient by reducing leakage and general water 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.

Response to the consultation on the Proposed Domestic Fire Safety (Wales) Measure

Maintenance

Dwr Cymru

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.

2) As already stated the customer must ensure that the stagnant water in his/her sprinkler system cannot backflow into the domestic supply pipe and contaminate the water within it. As such the developer needs to provide in a chamber a backflow prevention valve (a single spring loaded check valve) in the sprinkler supply pipe, within the property boundary but as close as practical to the Street. This valve will need to be regularly tested for functionality or replaced. All this is a requirement of the Water Supply (Water Fittings) Regulations 1999.

Q4 There will be significant extra cost and time to make a sprinkler connection at the same time as a new domestic connection because of the increase in the number of pipes and fittings, and not least the increase in size of the communication pipe. This mainly because the larger pipe will be less flexible which will make it more difficult to thread past existing apparatus belonging to other utilities. The extra time will naturally increase disruption to traffic and pedestrians and the extra apparatus, including having two chamber covers instead of one for each house, will cause additional problems for highway authorities and other utilities. The increased number of joints will also increase the risk of leakage and the need to excavate the highway to make repairs.
In order to avoid having two chambers per dwelling in the pavement, at the request of DCWW a combined chamber is being developed which, albeit costly, will reduce construction costs as well as being less disruptive to highway authorities and other utilities.

Preliminary calculations suggest that for a new house the costs payable to DCWW extra to the current costs for just providing a domestic supply would be approximately:-

£695 with no excavation or reinstatement by DCWW (ie new housing site)
£763 where DCWW excavates and reinstates in unmade ground (eg in a grass verge)
£893 where DCWW excavates and reinstates in made ground (eg footpath or minor road)
£976 where DCWW excavates and reinstates in made ground (major road or where traffic lights are needed.

There would be different (but similar) costs where there was already satisfactory domestic supply but an independent new sprinkler supply was needed.
DCWW stresses that the provision by the developer of a tank and a pump for each dwelling for the sprinkler system, which could be filled slowly from the domestic supply pipe would eliminate any extra charges by DCWW.

Comments on the explanatory Memorandum

5.6 We consider it would be prudent for a few small trial developments to be fitted with domestic sprinkler systems in advance of the whole of Wales to provide experience and an opportunity to modify arrangements before it applies throughout Wales. This will help ensure a smooth commencement of the installations.

8.7 As detailed above DCWW remains convinced that the extra costs of providing a water supply without the installer providing a tank and a pump will be significant but it will make every effort to ensure that costs are minimized.

8.12 Availability of installers - It is understood that that currently only plumbers trained to install fire sprinkler systems are able to purchase specialist sprinkler equipment and therefore such plumbers would need to be employed in addition to the plumbers contracted to install the other plumbing in the dwelling. The extra cost of doing this will need to be taken into account. It also needs to be determined if there are currently a sufficient number of trained sprinkler plumbers in

Wales to accommodate the demand for installations that will be generated by approximately 10,000 new dwellings a year. Might it be a particular problem getting a specialist installer when required by the builder in dwellings on very small developments or at individual new dwellings, to avoid delaying the construction of those premises.

8.18 Maintenance – As stated above, maintenance by the customer of his/her check valve to prevent contamination by backflow of the domestic water supply by stagnant water in the sprinkler system is important.

8.20 DCWW will tell every applicant that its preferred option (like the rest of the UK water industry) is for the sprinkler system to be operated using a current standard domestic supply pipe to slowly fill a storage tank (provided by the applicant) with a pump on the outlet to ensure the flow and pressure enables the sprinkler system to operate effectively at all times.

8.78 It should be noted that the cost of providing and maintaining fire hydrants is borne by the Fire and Rescue Service.

Please note that Keith Pratley retires on 3 September 2010 and all future correspondence should be sent to his manager, Sharon Evans, Head of Water Quality at the above address.
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For Dwr Cymru Welsh Water

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