



**Cynulliad Cenedlaethol Cymru
The National Assembly for Wales**

**Y Pwyllgor ar y Gorchymyn Cwmhwysedd
Deddfwriaethol Arfaethedig ynghylch Diogelwch Tân
Domestig
Proposed Domestic Fire Safety LCO Committee**

**Dydd Mawrth, 22 Ebrill 2008
Tuesday, 22 April 2008**

Cynnwys
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2008
National Assembly for Wales (Legislative Competence) (No.7) Order 2008

Cofnodir y trafodion hyn yn yr iaith y llefarwyd hwy ynndi yn y pwyllgor. Yn ogystal, cynhwysir cyfieithiad Saesneg o gyfraniadau yn y Gymraeg. Mae hon yn fersiwn ddrafft o'r cofnod. Cyhoeddir fersiwn derfynol ymhen pum diwrnod gwaith.

These proceedings are reported in the language in which they were spoken in the committee. In addition, an English translation of Welsh speeches is included. This is a draft version of the record. The final version will be published within five working days.

Aelodau'r pwyllgor yn bresennol
Committee members in attendance

Peter Black	Democratiaid Rhyddfrydol Cymru Welsh Liberal Democrats
Mark Isherwood	Ceidwadwyr Cymreig Welsh Conservatives
Huw Lewis	Llafur (Cadeirydd y Pwyllgor) Labour (Committee Chair)
Sandy Mewies	Llafur Labour
Janet Ryder	Plaid Cymru The Party of Wales

Eraill yn bresennol
Others in attendance

Alan Brinson	Cyfarwyddwr Gweithredol, Y Rhwydwaith Chwistrellau Tân Ewropeaidd Executive Director, European Fire Sprinkler Network
Graham Ellicott	Prif Swyddog Gweithredol, Cymdeithas y Diwydiant Tân Chief Executive Officer, Fire Industry Association
Stewart Kidd	Ysgrifennydd Cyffredinol, British Automatic Fire Sprinkler Association Ltd Secretary General, British Automatic Fire Sprinkler Association Ltd
Ronnie King	Is-gadeirydd, Y Rhwydwaith Chwistrellau Tân Cenedlaethol Vice-chairman, National Fire Sprinkler Network
John Purser	Ysgrifennydd y Frigâd, Gogledd Cymru, Undeb y Brigadau Tân Brigade Secretary, North Wales, Fire Brigades Union

Swyddogion Gwasanaeth Seneddol y Cynulliad yn bresennol
Assembly Parliamentary Service officials in attendance

Sarah Beasley	Clerc Clerk
Lewis McNaughton	Dirprwy Glerc Deputy Clerk
Sue Morgan	Cynghorydd Cyfreithiol Legal Adviser
Ben Stokes	Gwasanaeth Ymchwil yr Aelodau Members' Research Service

Dechreuodd y cyfarfod am 9.15 a.m.
The meeting began at 9.15 a.m.

Cyflwyniad, Ymddiheuriadau a Dirprwyon
Introduction, Apologies and Substitutions

[1] **Huw Lewis:** Good morning, everyone. We will go through some domestic announcements before the television people catch up with us. I remind all Members and members of the public, as well as our witnesses this morning that the committee operates

bilingually and headsets are available for translation, or as an induction loop to aid hearing, if necessary. Channel 0 will give you the verbatim broadcast of committee proceedings for those with hearing difficulties, and channel 1, the translation from Welsh to English. If there is a fire alarm, the ushers will escort Members from the room. Please turn off any mobile phones, pagers or electronic devices, as they interfere with the broadcasting and translation systems. When the time comes for you to speak, please do not touch the microphone buttons in front of you; they should automatically switch on for you to be heard clearly. It is now past 9.15 a.m. so let us move on.

9.16 a.m.

**Gorchymyn Cynulliad Cenedlaethol Cymru (Cymhwysedd Deddfwriaethol)
(Rhif. 7) 2008
National Assembly for Wales (Legislative Competence) (No.7) Order 2008**

[2] **Huw Lewis:** I warmly welcome John Purser from the Fire Brigades Union and Graham Ellicott from the Fire Industry Association. I understand that Grant Mayos cannot be with us today, but I am sure that we will manage competently without him. Would you like to introduce yourselves and describe your roles, please?

[3] **Mr Purser:** My name is John Purser, and I am the brigade secretary for the Fire Brigades Union in north Wales.

[4] **Mr Ellicott:** I am Graham Ellicott, and I am the chief executive officer of the Fire Industry Association. We are a trade association, which represents fire protection systems, manufacturers, designers, installers and maintainers in the UK.

[5] **Huw Lewis:** Thank you. Questions have been allocated to various members of the committee to explore the issues surrounding the legislative competence Order on fire safety and sprinklers. We have a time constraint this morning in that we will need to finish in exactly an hour's time to allow our second panel of witnesses to come through. If I chivvy people along a little, that is why, so I ask everyone, including Members, to be as succinct as possible. The first group of questions is from me, and the first one is an obvious one in many ways, but it is important. What do you think we can achieve with the new powers that will be transferred to the Assembly by this LCO that we cannot achieve with existing legislation?

[6] **Mr Purser:** From my point of view, it will make the job safer for my members, so it will improve firefighter safety. We have had instances of firefighters in Wales dying, in Blaenau Gwent, for example, and firefighters also lost their lives in Stevenage recently. They would not have died if sprinklers had been fitted in those properties. There was an incident in Wiltshire recently where two people were saved purely because sprinklers were fitted in the domestic premises. Given that three in every four fires are in the home, if all domestic dwellings have sprinklers fitted, firefighters will not be subjected to the same risks, because the sprinklers will control the fire so that it is not so intense, and they will often put it out even before the firefighters get there.

[7] **Mr Ellicott:** In the longer term, it will increase the fire safety of the housing stock as years go by, and it will drive down the number of fire deaths.

[8] **Huw Lewis:** Thank you. Those answers were very succinct, as I requested. Are there any follow-up questions from Members? I see that there are not. My next question was about the Assembly's duty under the fire and rescue service national framework to ensure the safety of firefighters and the public. You may, if Members agree, have just summed up your answer to that question, as well.

[9] Moving on, therefore, how will the provisions of the proposed Order—and we may be covering the same ground here as well, but at least it is an opportunity to expand—affect the members that you represent?

9.20 a.m.

[10] **Mr Purser:** I would give the same answer to that as my previous one.

[11] **Mr Ellicott:** From the trade's point of view, it will almost certainly result in more sales of product and work for our members. That is the commercial take on it.

[12] **Huw Lewis:** Okay. This is indeed succinct. Let us move on to Sandy Mewies.

[13] **Sandy Mewies:** Do you think that there are other means of achieving the policy objectives that would be as good as, or perhaps more effective than, this one?

[14] **Mr Purser:** From my point of view, no. There has been a lot of political debate around this subject, at least since 2000. There were debates in the Houses of Parliament in 2006, and the building regulations have been going through, as well as the approved documents that fall out from those. There has been ample opportunity to bring in this sort of measure, but, for one reason or another, it has never been followed through to ensure that we make Wales a safer place in which to live.

[15] **Mr Ellicott:** The current UK building regulations are not prescriptive in the way that buildings are designed and constructed, and neither are the approved documents that support them, so the approved documents will guide people on designing and building a dwelling or commercial building or whatever it is, but you do not have to follow what they say. So, if you want to drive down fire deaths quickly, you will have to change what we currently have and you will have to be prescriptive about it. In the short term, the installation of domestic sprinklers would be a prescriptive change, but there are other alternatives; you drew on the US experience in your evidence. If you wanted to make a radical change in Wales, you could look to the American experience, where, in some states, people selling their house have to bring them in line with the fire code, which can require installing new fire and smoke detectors, hard-wired systems, sprinklers, and so on. That is a big step forward, and this LCO is the start of that step. That is your alternative, because people will not do it unless they are forced to do it.

[16] **Huw Lewis:** So, that it is legislative.

[17] **Sandy Mewies:** You have moved on to the next question, which was to you initially, Mr Ellicott, but perhaps Mr Purser could comment after that. In your evidence, you point out the position in the United States, and then you say that domestic sprinklers account for a small percentage of the fire-protection measures installed in the UK for all sorts of reasons, including the existence of alternative fire protection systems and the lack of drivers, such as its being a legal requirement. Can you expand on that?

[18] **Mr Ellicott:** Generally speaking, people will not do anything unless there is a commercial driver. It is often said that the insurance companies could drive the installation of extra fire protection systems, whether in commercial buildings or domestic dwellings, but the problem is that the whole package of home insurance includes insuring against flood damage, theft and everything else, and so the part relating to fire may be only 10 per cent. If the insurers give you a 10 per cent discount for fitting extra fire protection systems and your total premium is £200, you probably only get £20 off, so it is not a strong commercial driver. So, the use of insurance to make that happen is difficult. Another reason is that people are not

forced to do it. Bluntly, that is what it comes down to.

[19] If you want to install domestic sprinklers, either you will have to come up with a commercial driver, for example, that the Welsh Assembly Government divvies up a lot of money and does a deal with builders to put sprinklers in, or you will have to be prescriptive.

[20] **Mr Purser:** I agree that you need a legislative driver, but I am still wary of expanding the LCO. In the past, people have picked up on issues such as going for retrofits and the costs involved, and have used them as excuses. We need to ensure that we do not expand this too much and that we keep it narrow, so that we get this on the books and take it forward.

[21] **Sandy Mewies:** Are you both satisfied that this LCO will address the issues to do with the low domestic take-up of fire sprinklers?

[22] **Mr Purser:** Yes.

[23] **Mr Ellicott:** Yes, if only for the fact that people will have to do it.

[24] **Huw Lewis:** Janet has a quick supplementary question.

[25] **Janet Ryder:** The LCO is asking for the powers from Westminster, and if we ask for too limited a set of powers, we may not in future be able to expand on what we have established. It is the same dilemma that we discussed when questioning Ann Jones, the sponsor of the LCO: if we limit it too much, we will be limiting our own ability for the future. That is, having established it and getting it working, we will not be able to expand it further. I think that we should ask for as wide a range of powers as possible in the LCO, and it will then be up to the Assembly to choose how to use those powers in Measures. That is when we can be selective and ensure that we install sprinklers. Would you like to comment on that?

[26] **Mr Purser:** To be blunt, that would end up being a political decision for the Assembly. In the past, when people have gone for too wide a range of powers, too many different interest groups have come in and that has stopped the legislation from becoming law. I understand exactly where you are coming from because, in an ideal world, I would like to see sprinklers in every building, but I have to be realistic. To be honest, as three out of four fires are in the home and the majority of fire deaths occur in the home, I believe that keeping the LCO to sprinklers in domestic properties would be the best way forward.

[27] **Peter Black:** The legislation that would actually capture that would be the Measure and not this LCO. That is the important thing.

[28] **Sandy Mewies:** This question is to Mr Ellicott initially, but Mr Purser may wish to comment afterwards. You say that the Fire Industry Association has grave concerns about the reduction of other fire protection systems—and I presume that you mean fire doors, and so on—to justify the cost benefits of sprinklers. Can you expand further on that point, because we have already been told that, if domestic fire sprinklers were installed, it could free up the design of buildings?

[29] **Mr Ellicott:** You currently have freedom of design anyway, so if you want to design a building, you do not have to follow approved document B; you can have an architect to design your building and then get it passed, initially by the fire authority, and then by building control or the approved inspector. When it comes to fire doors in domestic dwellings, I am no big expert—we do not tend to cover fire doors; there are other trade associations that do that—but, in general, to the best of my knowledge, I think that there is only one fire door in a house and that is between the house and the garage. So, if you take that one out, you will not

make much of a saving, and you will still need a door there. So, I think that making savings from fire doors is a bit of a misnomer.

[30] What worries me is the comment about possible changes to structural considerations, which I saw in the original documents. Most people who die in a house fire die from smoke inhalation. The secret of controlling smoke is good compartmentalisation: if you have sound walls and doors, the smoke cannot get from the seat of the fire to where the people are. If you reduce the strength of the structural design of the building, you may increase the risk of the building moving around in the fire. That is, the walls may start to move and open up gaps, and smoke and toxic fumes could then get through. That would be our concern, if you were to go for that trade-off. You could go to the extreme and say, 'If you have put sprinklers in every building, you do not need as many firefighters'. Where do you stop the trade-off, if you go down that route?

[31] **Mr Purser:** I think that there is a little confusion here when people are talking about a trade-off. People who have loft conversions done need to ensure a secondary means of escape from the loft, and that is usually a ladder out of the window, which is not ideal. However, if they have sprinklers installed, they can maintain their means of escape via the internal staircase for a lot longer and so that loft space or places further away from the final means of escape can be used. That is the impression that I am under.

[32] **Sandy Mewies:** That is what was said last week.

[33] **Mr Purser:** It is not actually a matter of altering fire doors, and you would still need hard-wired smoke detectors. This is to complement, not to replace, the existing fire safety measures.

[34] **Huw Lewis:** That is an important point. Are Members content thus far? I see that you are.

[35] **Peter Black:** The evidence from the Fire Brigades Union says that,

[36] 'Whilst in an ideal world, all premises should be sprinklered, it is not realistic at this point in time'.

[37] Would you like to expand on why you believe that it is not realistic?

[38] **Mr Purser:** On 1 March 2006, Jim Fitzpatrick was in a debate regarding sprinklers and said that they would be extremely costly and he believed that registered social landlords would argue for additional funding. That is why I think it would not be realistic: the cost implications.

9.30 a.m.

[39] So many different focus and stakeholder groups will be arguing against this, not for safety reasons, but purely for the financial and technical details and so on. New housing stock today will be old housing stock tomorrow, and so, while it is incremental change, it is realistic and can be afforded, because it will increase the housing costs only slightly. If you went for retrofitting and stuff like that, it would be too expensive, and the goodwill behind this particular initiative would be lost.

[40] **Sandy Mewies:** We heard from people in previous evidence that, once people see this safety precaution working, they expect the market to change, and people will want to see sprinklers retrofitted. You mentioned the American system. Do you agree that that is what will happen?

[41] **Mr Purser:** There is already an example of that in Warrington, where there is an estate that was built with the local council, and 50 per cent of it was low cost and 50 per cent was built by builders. The building side had no sprinklers fitted; the low cost did. People living in the builders' half of the estate are now requesting retrofitting, and asking why they were not afforded the same level of protection.

[42] **Peter Black:** My concern is that a huge percentage of the housing stock in Wales is more than 100 years old and, given that they do not build them like they used to, it still looks like it could go on for another 50 or 60 years, as they are improved. My concern is that a lot of new build will be safer for the occupant and the firefighter, but a huge proportion of older housing stock in Wales will not have the same level of protection. Many of those houses will be occupied by pensioners or people who are particularly vulnerable, namely those groups that have been identified as being at particular risk of fire. Do you have a view on that?

[43] **Mr Purser:** I have a great deal of sympathy with that view, and I can understand where you are coming from. My main aim is to get sprinklers into properties, and the easiest way to do that is to get them installed in new-build properties and, hopefully, the drip-drip effect will work its way through. However, you must also realise that a number of the groups that you are talking about do not have the money to undertake these initiatives. Given how some of these properties were built, it might not be technically possible. I do not know. However, by trying to expand the LCO, you run the risk of the whole of the LCO failing.

[44] **Peter Black:** Is there not a case for saying that sprinklers should be included as part of the refurbishment under a renovation grant, for example?

[45] **Mr Purser:** Without knowing the technical details of each and every one of those premises, it is hard to say, as they will all have a different building construction and so on. You must also realise that a number of older houses will have protection rights on them from different organisations and so on, so being inflexible would not work to your best advantage at this time.

[46] **Peter Black:** Does Graham want to comment on those questions before you bring all the other people in?

[47] **Mr Ellicott:** I agree that the retrofitting of sprinklers would be expensive. With existing housing stock, it goes back to the comments that we made earlier about making some code improvements when selling or changing the house, or when a new tenant moves in. We discussed outside the room that people take doors off, but doors are essential to compartmentalisation. Simple things like that, which could be upgraded, would greatly increase fire safety, as would insisting that people install smoke detectors. Even a battery-powered smoke detector is better than nothing, and hard-wired would be better again, but a significant amount of housing stock still does not have any smoke detectors.

[48] **Janet Ryder:** You have talked specifically about new build and Peter has asked about the renovation grant. What is your opinion about properties that are renovated, particularly with a view to turning them into homes that offer a number of dwellings?

[49] **Mr Purser:** Again, without knowing the actual design and construction of those premises, it is hard to say. If you are too inflexible, I believe that this LCO will fail. I believe that, from looking at previous debates and previous political initiatives in this area, by trying to widen it too much, you will not fulfil your initial objective.

[50] **Peter Black:** Coming back to a point that you have already touched on, the Fire Industry Association evidence notes that the retroactive fitting of sprinklers is not provided

for in the proposed Order, and you discuss the possibility of considering bringing houses up to the fire code, as Huw mentioned earlier, when they are sold, as is the case in some parts of the USA. You suggest that, in this situation, it should not only be sprinklers that might be installed, but smoke alarms, fire doors, carbon monoxide detectors, and other relevant systems. Can you outline what benefits this would have over the proposed Order, and have you considered whether such a requirement, which is perceived to be better, could alienate people, as we have discussed? Is it realistic to do that?

[51] **Mr Ellicott:** The benefit would be that you would improve the fire safety of the housing stock more quickly than you would with domestic sprinklers. The risk, as my colleague has outlined, is that, if you make it too complicated, then I guess that the Order may fail. It would require extra inspectors and people to go out to help people to do this sort of work. We have the home information pack reports now, which I guess you also have in Wales. As far as I am aware, HIPs reports do not cover fire. Therefore, if they were to include fire and comment on smoke detectors, the lack of sprinklers and fire doors and so on, that could be a way forward too. I am aware that, if you have a HIPs report, you do not have to act on it, but it makes it more difficult for you to sell your property if you do not.

[52] **Peter Black:** As a supplementary question to that, you say in your evidence that £14 million worth of portable sprinkler systems were sold to the housing market in 2006. Are those systems as effective as in-built sprinklers? What are their advantages and disadvantages when compared with the in-built systems?

[53] **Mr Ellicott:** Those are portable fire extinguishers. Portable fire extinguishers require someone to understand how to operate them, and to act when a fire breaks out. If people are asleep, or if they are not in the building, then they cannot use the portable fire extinguisher. Most people would have a portable fire extinguisher in their kitchen.

[54] **Peter Black:** I understand that there are portable sprinkler systems.

[55] **Mr Purser:** Yes; we have several in north Wales, which we have used when we have identified people who are at a particularly high risk. Unfortunately, they are not aesthetically pleasing—they are large, clumpy devices, and they are very expensive. It is not often that you will put them in the whole home—you will put the sprinklers in the one area of the home that the person resides for most of the time. It is a good short-term solution, if we know that we have someone of particular high risk, because someone cannot be there 24/7. However, in the medium to long term, I do not believe that it is an alternative.

[56] **Mr Ellicott:** That is right. The Ministry of Justice is looking at this type of system for prisons. It is targeting areas where it has severe problems with particular prisoners and particular cell blocks, but it does not see it as a long-term solution either.

[57] **Mark Isherwood:** On the point about portable sprinkler systems, we heard similar comments last week from the fire officers about their not being very aesthetic, and therefore perhaps not popular, although I believe that they have been effective in certain instances. If the market demand for those grew—and I am thinking more from the production and business side—could they not be designed to be more aesthetic and more flexible, to meet the needs of the home and to target those vulnerable people who might otherwise fall outside the remit or the area that this Order would cover?

[58] **Mr Ellicott:** I am sure that they could be designed to be more aesthetically pleasing. However, you have the inherent problem that you need water for them, so you are going to have to have some tank storage in many cases, which would mean that you would have a bulky item rather than a concealed sprinkler head that no-one can see, so that is the downside.

[59] **Mr Purser:** There is also a cost implication—they are much more expensive than fitting sprinklers into new-build properties at the time of construction.

[60] **Mark Isherwood:** You referred to HIPs; what about the role of survey and evaluation reports in highlighting this in future?

[61] **Mr Ellicott:** That is another alternative; if the building society insists that you have an extra survey, this aspect could be included.

9.40 a.m.

[62] **Peter Black:** You have largely answered my next question, but I think that the supplementary question is still relevant. Are there any matters outside the scope of the proposed Order that you would wish to be included in it?

[63] **Mr Purser:** Personally, no.

[64] **Mr Ellicott:** No. I tend to agree. For the Order to be successful, you should target domestic sprinklers in new builds.

[65] **Huw Lewis:** Thank you for that. We now move on to a series of questions from Mark Isherwood.

[66] **Mark Isherwood:** In your FBU submission, you state that the proposed Order should be reworded to reflect the British standard and use the term ‘domestic occupancy’ rather than ‘residential premises’. Why do you prefer that term?

[67] **Mr Purser:** It is presently being used in the British standard. If we can try to keep the terminology the same all the way through, I think it will eliminate confusion and prevent people from trying to nitpick the LCO on its way.

[68] **Mark Isherwood:** Why do you think it should be included in the Order, rather than be a matter for the Measure that would follow the Order?

[69] **Mr Purser:** To be honest, I have no strong opinion on that aspect. My main objective is to get sprinklers into all new build properties. Whether it is in the Order, guidance or whatever, as long as the aim is achieved, I would be pleased. As long as sprinklers are installed in all new build properties, I will be happy.

[70] **Mark Isherwood:** Do you think that this could have a limiting effect on future Measures, particularly if the British standard is revised in future?

[71] **Mr Purser:** You would need to link it in with the British standard. Therefore, as the standard changed, so would the requirements of the LCO.

[72] **Mark Isherwood:** The Measures that would follow should then be amendable beyond the remit of the Assembly, should they not?

[73] **Mr Purser:** I would have thought so; I am not an expert in that area. I am a professional firefighter, so I am not an expert on such matters.

[74] **Mark Isherwood:** Okay. Thank you, John. Linking this to the issues of the definitions of domestic occupancy, as set out in BS 9251:2005, what types of property do you feel the definition would cover that the current proposed Order would not?

[75] **Mr Purser:** Again, that has been put in purely to try to ensure that we use the same terminology throughout. I will not say that it will make one iota of difference. The only thing that I am worried about is that, if we do not use the same terminology in all the different British standards, legislation and so on, there will be confusion and people will use that to the detriment of the LCO.

[76] **Mark Isherwood:** Does the FIA have a view on this?

[77] **Mr Ellicott:** No.

[78] **Huw Lewis:** Are you content, Mark? I see that you are. Janet Ryder has a couple of questions now.

[79] **Janet Ryder:** They are very much along the same lines as Mark's questions. The definition 'domestic occupancy' prescribes a maximum individual room size, which might exclude certain properties. That definition prescribes a maximum individual room size of 40 sq m, apparently.

[80] **Mr Purser:** It does, but that is guidance. As long as you have water pressure that will operate two sprinklers, you could increase that 40 sq m quite easily. This is already done in industrial premises. If there was a fire, no more than two sprinkler heads would operate at once anyway, so, provided that whatever system you are using had sufficient pressure for two sprinkler heads to operate, even if the room was 60 sq m, I do not think that would present too many problems.

[81] **Janet Ryder:** This is your field of your expertise, is it not? This is really going into the definition of it. If we used that definition, it might be that we rule out properties with rooms that are larger than 40 sq m. We are just trying to tease out the detail.

[82] **Huw Lewis:** This is an important issue that was not resolved at our last meeting.

[83] **Peter Black:** I think the concern is that, if you go with that definition, properties that are being built with rooms bigger than 40 sq m will not be compelled to fit sprinklers. That is a concern because you get rooms that big in some new build properties.

[84] **Mr Purser:** I am not in a position to answer that question. It is something that you will need to ask the relevant expert in that field. From my point of view as a professional firefighter, I think that that can be worked around. It is not a huge problem.

[85] **Peter Black:** I accept that it could be worked around. Our concern is around the compulsion that is in the legislation. We want to ensure that, if new-build properties are to be required to install sprinklers, the requirement will apply to all new builds, irrespective of the size of the rooms. That is the issue that we are trying to explore.

[86] **Huw Lewis:** We have explored this with previous witnesses and we must have a definitive judgement on what 40 sq m actually means. Can I suggest that the clerk perhaps seeks advice from the Members' research service or the legal service?

[87] **Peter Black:** We also need some guidance on a definition that will not be restricted in that way.

[88] **Huw Lewis:** I would be happier if we had some written advice on exactly what that means from someone who understands it.

[89] **Sandy Mewies:** You asked about things such as barn conversions last week.

- [90] **Huw Lewis:** Yes, I asked about large open-plan buildings.
- [91] **Sandy Mewies:** However, we have heard Mr Purser say today that, in his professional opinion, which I certainly accept, as I am sure everyone else does, two sprinklers would cover the wider area—
- [92] **Mr Purser:** Normally, in the case of a fire, only two sprinkler heads would operate.
- [93] **Sandy Mewies:** Did you not say that they could cover an area larger than 40 sq m?
- [94] **Mr Purser:** No, if you have a room of 60 sq m, for example, rather than having six sprinkler heads, you could increase that to eight or 10. As long as you have the water pressure there, two of those sprinkler heads will operate—
- [95] **Sandy Mewies:** Can we have clarity about the relationship between what has been said today and what was said last week?
- [96] **Huw Lewis:** That would be a good idea because there is an outstanding concern here.
- [97] **Janet Ryder:** I was not at last week's meeting, but, for me, the crucial issue, regardless of whether you use the term 'domestic occupancy' or the term 'residential premises', is whether someone is living in the building. This seems to suggest that, if a building is over 40 sq m, it is not going to be used for living in, but many barn conversions are open plan—
- [98] **Huw Lewis:** I think that that is everyone's concern.
- [99] **Peter Black:** The problem is that that definition is more restrictive.
- [100] **Huw Lewis:** Exactly; if we tie in to BS 9251:2005, which would be done for good reasons, we also seem to have this problem with properties with rooms that are larger than 40 sq m being excluded. So, we need to get to the bottom of that, and we will.
- [101] **Janet Ryder:** I have another question that relates to terminology. The Fire Brigades Union initially said in its submission that the term 'sprinkler system' should be replaced with 'automatic water suppression system'. Is that, again, a matter of common terminology?
- [102] **Mr Purser:** It is just terminology.
- [103] **Janet Ryder:** It is not a different thing?
- [104] **Mr Purser:** No, but when you talk about sprinklers, many people will get that confused with garden sprinklers and other things. The fire service just likes its technical terminology.
- [105] **Janet Ryder:** What is the Fire Industry Association's view?
- [106] **Mr Ellicott:** I would agree that 'automatic water suppression system' is better understood in the trade.
- [107] **Huw Lewis:** Just before we move on, which I think we will be able to do soon, I would like to return to something that you mentioned in your evidence. You suggested that, once the principle of sprinklers in new-build domestic properties is accepted, it could be used as a springboard for other initiatives. Can you expand on that? What exactly did you mean by

that?

[108] **Mr Purser:** As we have said, once we have the legislation in place and people can see how effective it is—as was the case in Warrington—people will be more willing to use their money for this. I was thinking that we could use certain initiatives, through the Welsh Assembly, to educate people about sprinklers and what they can do. I do not think that it is just a case of getting this LCO through and getting the Measures that will follow; I can see this as being part of an ongoing series of processes, so that, eventually, all residential properties will have sprinklers.

[109] **Mr Ellicott:** In general, it will mean that people who own houses or live in houses will think about fire, and this will raise the profile of fire as a problem.

[110] **Huw Lewis:** It will certainly raise the profile of the issue. Are Members content or are there any supplementary issues that they would like to pursue? We have been remarkably concise with our witnesses.

9.50 a.m.

[111] **Mark Isherwood:** Graham, you are a representative of a trade body, so when your members attempt to sell equipment to your customers, many of whom will be the people who build the houses and dwellings that we are talking about, what response do they tend to get when they talk about sprinklers? Is there resistance, and, if so, what is that based upon?

[112] **Mr Ellicott:** We are not the main trade body for sprinklers. I believe that you will be seeing the British Automatic Fire Sprinkler Association Ltd afterwards; we have some sprinkler members in our association. My experience in talking to the members that we have is that, like most things in the construction industry, it is money-driven—if they do not have to do it, they will not do it, so the main contractor would say that they need a commercial driver.

[113] **Mark Isherwood:** So, as far as you are aware, do they have any broader or technological objections or do they cite infrastructure problems?

[114] **Mr Ellicott:** No. I think that the UK construction industry and the UK fire industry—particularly the latter—is one of the most innovative in the world. So, there are ways to solve the problems; in my opinion, it comes down to money.

[115] **Huw Lewis:** Okay, I think that Members are content. Is there anything that you wish to add or are there any supplementary points that you do not feel that you have been able to get across during your answers?

[116] **Mr Ellicott:** The only thing that I would add is that, when the Order goes through, you will have made a philosophical change to the way in which buildings are designed and constructed. If you were to go back to the mid-1980s, we had prescription as to how buildings were built, and that was done away with, for all sorts of reasons, which actually cut, in many cases, the amount of fire protection provided in buildings. You are going back, or going forward—whichever way you want to look at it—to another regime, so this is a big philosophical change.

[117] **Huw Lewis:** Okay, but you should never ask politicians to go back. [*Laughter.*] We can find another form of words, but we know what you mean.

[118] **Mr Purser:** The Fire Brigades Union has been running a NO2 Fire Deaths campaign since 2004. This fits like a glove with that campaign, and we are more than happy to be

working with the Assembly and we would like to be involved in any future initiatives around this. This is politics in action and it is for the betterment of the people of Wales.

[119] **Mr Ellicott:** It is the same in the trade; we do a lot of work in disseminating information on the Regulatory Reform (Fire Safety) Order 2005 for commercial buildings, for instance. We work with the Department for Communities and Local Government and the Scottish Government on that, and there is no reason why we could not work with you guys—for want of a better term—on disseminating information to builders and domestic homeowners.

[120] **Huw Lewis:** Thank you for taking the trouble to be with us this morning, and also for being remarkably concise and to the point, which has left us with a little extra time. Have a safe journey home. We have some leeway, so, while our other witnesses are getting ready, it might ease things a little if we had a short break.

*Gohiriwyd y cyfarfod rhwng 9.53 a.m. ac 10.01 a.m.
The meeting adjourned between 9.53 a.m. and 10.01 a.m.*

[121] **Huw Lewis:** Welcome back, everyone. I also welcome, on behalf of the committee, the witnesses who have just joined us. We have with us Ronnie King from the National Fire Sprinkler Network, Stewart Kidd from the British Automatic Fire Sprinkler Association Ltd, and Alan Brinson from the European Fire Sprinkler Network. Welcome, gentlemen, and thank you for your attendance this morning. We will move on in a second to a series of questions from Members to explore the issues and tease out some of the concerns around the domestic fire safety legislative competence Order that we are dealing with here. However, would you first like to introduce yourselves and say a little more about your role in the field?

[122] **Mr King:** My name is Ronnie King. I am the vice chairman of the National Fire Sprinkler Network. The chairman is Peter Holland, who is a serving chief fire officer in Lancashire. I am a retired chief fire officer. The network principally represents all UK fire authorities. Other organisations attend our meetings, but our main purpose is to fight, lobby, and try to improve the number of fire sprinklers in buildings in the UK—in all buildings, but we obviously have lists of priorities. This is certainly one of our priorities.

[123] **Mr Kidd:** Good morning. Thank you for inviting us here. I am Stewart Kidd, and I am the secretary general of BAFSA, which is the trade association for sprinkler installers and for those who manufacture components for sprinkler systems. I have been in this role for eight years. Prior to that, I was the director of the Fire Protection Association, the UK's national fire safety body, and I was also the director general of the Arson Prevention Bureau, a joint insurers/Home Office initiative; it is still in existence but has largely been superseded by the Arson Control Forum.

[124] Part of the evidence that I will be giving today is evidence that I gave to the Safe as Houses working group in 1996, where the Government appointed an external review group to consider the problems of domestic fire safety and the reasons why so many lives were being lost in domestic fires. The association represents the trade, fire brigades, insurers, consultants and others with an interest in fire safety.

[125] **Mr Brinson:** Good morning. My name is Alan Brinson, I am the executive director of the European Fire Sprinkler Network. I worked in the fire protection industry for 10 years in a number of European countries. Five years ago, I set up the European Fire Sprinkler Network, the members of which come from the sprinkler industry, the insurance industry, laboratories, local authorities, fire authorities and a number of consultancies. Our members come from 13 European countries. They have a common interest, which is to see an improvement in fire safety across Europe through the widespread fitting of sprinkler systems.

[126] In Wales, the situation has its own unique points, but many of the problems are common to other countries and regions of Europe, in that the majority of fire deaths occur at home, and, in many cases, those who are affected are from lower or disadvantaged socioeconomic groups. You are leading the way in addressing this and trying to find a solution. You are not alone: it has been looked at in Glasgow, and it is also a major concern in Finland. So, I bring some information and evidence from other parts of Europe and the United States to the committee today.

[127] **Huw Lewis:** It is useful to have that pan-European perspective. The first question is to all three of you, gentlemen, and it is a basic question: what do you think the powers that might be conferred to the Assembly through this LCO would achieve that working through current legislation would not? What would be the added value? Is there added value to this path?

[128] **Mr King:** There is a solution to the number of fire deaths that continue to occur in Wales and in the United Kingdom, and the terrible injuries—three girls were seriously burned in a fire in Llanelli, recently, and, often, the results of some of those injuries go on for years and years, putting a burden on the health service. While we are very much looking at deaths, it is appropriate to remember injuries too, because they are also pertinent. I served on the working group that steered ‘Wired for Safety’ through under Mrs Hart, and I certainly felt that Wales was leading the way then. That document has reached a plateau in terms of how many more deaths and injuries it can presently stop, because it is probably at its optimum. Reducing fire deaths and injuries, and property damage, which is substantial in Wales, as well as in the UK, can be achieved by these powers. Given that Wales is in the upper quartile, we have a special reason for looking at it as a testing ground for this legislation. It is a superb idea.

[129] **Mr Kidd:** The question needs to be reversed and what needs to be answered is what will happen if you do not do it. Similar questions were asked in the early 1990s, when smoke alarms were first proposed; some of the arguments against them were that the penetration would be so small that it would not make any difference, that only the people who were alert to fire would install them anyway, and that, ultimately, legislation would be required, as, of course, it was. However, even that legislation was questioned on the basis that the UK housing stock was so large that it would take 50 years before a substantial proportion of homes was so protected. That proved not to be the case, and smoke alarm penetration in the UK varies at between 65 and 85 per cent, depending on where you are. That is not necessarily working smoke alarms, but the presence of smoke alarms.

[130] The other issue is that the strong support from the fire service has surprised me. The fire service has taken the view that the only way that it can achieve its objective of a reduction in the number of lives lost is to look at other things. The phrase ‘the hard to reach’ has been used with respect to fires. To make a generalisation, fires are an indication of poverty, deprivation and a lack of access to services. It is interesting that the highest fire death rates in the UK are in parts of north Wales and in Strathclyde, where there is extensive deprivation.

10.10 a.m.

[131] I commend the work undertaken in South Ayrshire. The council there bit the bullet and installed sprinklers in all its high-rise blocks, all its social housing and sheltered housing, and in selected housing provided for single men, a group that is at particular risk. Strathclyde Fire Brigade now estimates that nine lives have been saved by sprinklers that have been installed in the past five years. South Ayrshire estimates that it is probably not far off breaking even on the investment of about £500,000 by virtue of the reduction in repair and refurbishment costs after fires and the cost of decanting tenants from blocks in which fires

have caused damage going beyond one flat. Strathclyde Fire Brigade also estimates that in what were 68, I think, fatal fires over a five-year period, 62 lives would have been saved had sprinklers been present.

[132] Those are pretty powerful arguments, and taking into account the work done in the US and in Vancouver and elsewhere—I am not prepared to draw comparisons, as they are meaningless—I believe that, if we have accepted the fact that we have got as far as we can with smoke alarms, hard-wired smoke detectors and education, then the time is right, presumably, to try something else. It seems to me that the very commendable approach that the Assembly has taken in even considering this issue is probably the right one.

[133] **Mr Brinson:** I will not repeat what my colleagues have said except to say that I agree with them. Picking up on something that Stewart said, it is perhaps a surprise to many that the vulnerable group seems to be single, middle-aged men, particularly those who are unemployed. I am not sure whether the data exist for Wales, but, in Finland, it was found that three quarters of those who die in fires are men—men are three times more likely to die than women—and they were often men in their forties, unemployed and alcoholic and so on. When you think that through, a smoke alarm may not help people like that, as they may be unable to respond to it. That is why, perhaps, they figure so prominently in fire deaths.

[134] Stewart said that he did not want to draw comparisons with North America. This may not be a comparison, but if Wales were to achieve the same level of fire safety as somewhere like Vancouver or Scottsdale, the number of fire deaths would be considerably lower than it is today. I see no reason why Wales should not be able to achieve that level through a measure such as that which is being proposed.

[135] Other than that, I think it entirely appropriate for Wales to pursue its own line in fire safety. You wish to address this problem. The Government at Westminster seems to be unsure about what it wants to do; it is largely sitting on the fence. There is plenty of evidence that in other parts of the world where communities have gone their own way, they have led the way. Often, it is a smaller community that can take such a step. In a larger community, more people have to be involved in the decision, and it is consequently slower and takes longer. Indeed, in Canada, we have the example of Vancouver. Now Ontario looks as though it may follow suit. You have to make a start somewhere, and Wales could be an example not just for the rest of the UK, but for the rest of Europe.

[136] **Huw Lewis:** My next question is a follow-up question to Mr King. You mentioned that the number of accidental fire deaths in Wales is in the upper quartile for the UK as a whole. Why might that be?

[137] **Mr King:** I picked these figures up from the north Wales report, which looked at six years of fire deaths. It is slightly at variance with the national trend, and slightly at variance with the male trend, as many of the deaths were among females of 60 and over. It was a slightly different trend that I picked up from the report. My knowledge of Wales suggests that rurality is probably a factor. Other factors include living alone, age, and being interactive with fire—that is, that people have a coal fire or smoke. Being under the influence of alcohol and drugs was also a factor.

[138] If fires happen in a remote area, as some of these probably did, then travel distances become a factor. There is a dependence on the fire service response, whereas, with a sprinkler system, you, effectively, have a firefighter in every room. That is probably one of the reasons. I know from my own experience in mid and west Wales, where I was chief fire officer for 20 years, that we had a lot of remote, rural risks involving 20-minute travel distances. Twenty minutes does not really do the job, whereas a sprinkler is already there to do it. That must be a significant factor. There are other areas of the UK that are equally remote, particularly the

highlands and islands, north Yorkshire, and parts of Strathclyde—I have not compared them with Wales, but I would think that remoteness is a factor in this.

[139] **Huw Lewis:** I also have a question for Mr Brinson. You quite rightly touched on the fact that the most vulnerable in society—the elderly, the disabled, the deprived—are primarily the groups that suffer the most. Is this LCO the right way to protect the most vulnerable? What will it do for them?

[140] **Mr Brinson:** There is always more than one way of addressing a fire safety issue, but a sprinkler system is the most comprehensive. To put it crassly, perhaps, it is idiot-proof. If you are unable to respond to other measures, or if you do not leave the room where the fire starts, a sprinkler system is not guaranteed to save you, but it gives you a chance. There is enough evidence and test data from fire tests that have been run by the Building Research Establishment—as I am sure you aware, a three-year project set up domestic fire situations and measured toxic products, including carbon monoxide, as well as the temperatures, and so on, affecting people remaining in the room where the fire started. Conditions did not remain tenable in every case, but in many cases they did.

[141] As well as the test data, we have anecdotal evidence, where there are many examples of people remaining in the room where a fire started, and even being close to where the fire started, and being saved by the sprinkler system. Of course, the intention is that you should leave the room, but this is the only measure that I can think of that would give you any chance if you do not, and if you were incapacitated for some of the reasons that we have mentioned, this is the thing that might save you. Of course, it also saves people outside the room where the fire starts.

[142] **Huw Lewis:** Of course—as well as people potentially fighting the fire. There is a quick supplementary question from Mark Isherwood.

[143] **Mark Isherwood:** I want to go back to the point that Mr King made about Wales being in the upper quartile for accidental fire deaths. You referred to figures for north Wales. Over the last decade, the number of incidents in south Wales fell substantially, whereas numbers in north Wales went up marginally, until last year, when they came down by 7 per cent. Why do you think there is that wide discrepancy within Wales? What has been happening? It is purely rurality, or have the forces been doing different things?

[144] **Mr King:** I think that both forces have promoted fire safety through hard-wired detectors, and extensive, vigorous campaigns. Were we to look at the details of those deaths, we would probably find that remoteness was a factor, and that reductions have been made in the areas where they could be made. Sprinklers are a magic wand—that is what we believe. They are the magic solution to fire deaths. If they were put in new buildings, it would of course take some time for the figures to come down, because it is only when you renew your housing stock or build new houses that sprinklers will be installed. However, that could be linked to a campaign that all fire services are looking at, within their limited budgets, to encourage the installation of sprinklers in the real, seriously hard-to-reach areas. It is more difficult in a rural area than an urban area, because it can happen anyway—it could be in Tregaron today or Pontrhydfendigaid or Crymych another day. Those areas are dispersed and you do not know where that will happen, but you know that it is more likely to be in a remote area.

10.20 a.m.

[145] **Mr Kidd:** You will have more data than us, but I wonder whether there is a connection with social renewal in the south—which is perhaps not happening to the same extent in the north—with new dwellings being built to new standards with hard-wired smoke

alarms and better fire separation and better fire compartmentalisation in the dwellings. There has been a lot more new housing built in the south than in the north, I do not know whether that is a relevant factor, but it is probably worth looking at.

[146] **Huw Lewis:** We now move on to a series of questions from Peter Black.

[147] **Peter Black:** They are technical questions more than anything else. Are there any types of domestic fires that a sprinkler system would not effectively tackle? For example, I am thinking of electrical fires.

[148] **Mr Kidd:** Sprinklers will put out any fire. In fact, in my work as a consultant, I put sprinklers into sub-stations and on transformers and on turbine generators. It is a fallacy that sprinklers will not put out some fires. The sprinkler water spray is finely divided and therefore extinguishes any fire, including fat fires and oil fires. It is not like the fire brigade cup test on the chip pan; it does not do that.

[149] **Peter Black:** So, on the water supply for water sprinklers, do you anticipate any differences or difficulties in the implementation of the proposed Order in, for example, urban as opposed to rural areas in Wales?

[150] **Mr Kidd:** That is a very interesting question that exercises all of us extensively, including our friends at Water UK. The water industry is not necessarily totally enthusiastic about sprinklers and would like to see them installed only with tanks and pumps and not with direct mains connections. There are issues here that may involve litigation at some stage, so I do not want to say too much except that our friends in the fire service are firmly committed to promoting sprinklers at the lowest possible price.

[151] The Westminster Government is equally committed and has spent a lot of money recently looking at what are called low-cost sprinklers, which would be integrated into the domestic plumbing system and therefore appropriate for new build. The water companies are unhappy about this and have been resisting any significant consensus view. Individual water suppliers have decided to go along with us and we have no problems with them. In other areas, Portsmouth Water, for example, has flatly stated that it will not allow direct connections to sprinkler systems from its mains, which we think is probably illegal. However, it is hard to reach a view. I have probably said too much already.

[152] **Huw Lewis:** No, I think that you have hit on something that we might need to explore further as a committee.

[153] **Janet Ryder:** I was going to ask a question on water supply, so it might be useful to do so now. We have raised the issue of isolated rural fires, but many properties in rural areas of Wales rely on springs or wells for their water supply, so can you see this having an impact on those residences?

[154] **Mr Kidd:** In rural areas, we are looking at tanks and pumps. I have already installed, as a consultant, some sprinklers in Scotland in several listed buildings because the fire brigade response has been downgraded in some areas, and we are going for tanks and pumps in all cases.

[155] **Mr Brinson:** You may not need a tank if you have a good supply from a well. That is common in the US where there are lots of rural communities, but a pump would be needed to get adequate pressure. A pump would probably already be installed, but a larger one may be needed. So, it depends on the circumstances, but, technically, there is no reason why such a building could not be fitted with a sprinkler system.

[156] **Mr King:** Keith Pratley is the Welsh Water representative on our water co-ordination group and the three of us as organisations have met with seven water companies. We have resurrected what was an ongoing series of meetings in the past to resolve general difficulties that might exist between us. I understand that he might be giving evidence to this committee. He certainly is an advocate, if that is the right word, of attempting to find answers rather than problems. We have always felt that many of the water companies find a problem that means that something cannot be done, and it is always about leakage and keeping pressure down so that they solve the leakage problems—

[157] **Mr Kidd:** And theft.

[158] **Mr King:** Yes, and theft.

[159] **Mr Kidd:** They think that we are going to steal their water through the sprinklers.

[160] **Huw Lewis:** We will be exploring that with the water industry next week.

[161] **Peter Black:** The issue that we are touching on here is one of water pressure. There are reasons why water companies are concerned about the level of pressure that they apply to the water, and leakage is one of them. The biggest concentration of houses is in towns where, in the vast majority of cases, people will want to connect their water sprinkler systems to the mains. How big a problem is the issue of water pressure in those sorts of areas? Are we always going to have to resort to pumps or other solutions?

[162] **Mr Kidd:** I do not think that the solution to leakage by reducing pressure should be allowed to impinge on matters of public safety. If the water companies cannot get their acts together, there is a problem with the water companies. There is a very clear statement of fact in the Water Industry Act 1991 that says that water for firefighting may be abstracted by any person from any main to which a hydrant is connected, and there are very few mains that do not have a hydrant connected somewhere. The issue is that sprinklers do not need very much water and do not need a very high pressure. For example, we happily connect domestic systems at 1.5 bars with a 35mm connection. That, to me, is not ridiculously large. The issue arises with water meters, in some cases, which restrict flow and pressure, and that could impinge on the effect of sprinklers. Unannounced reductions in pressure could also impinge on that. You could get a system that is very happily getting 3.5 bars one day, but, at midnight the next, there is zero pressure, because that is what is done at night to save energy. There are issues there that the water companies have to resolve.

[163] Their primary concern, which could be addressed by law, is that they are afraid of the liability implications. If they supply water to a sprinkler system that is directly connected to the mains, they do something to impact on that flow and pressure, and there is a fire and someone dies, will they be held liable? The analogy is very simple. I have spent 10 years of my career working for power companies, and I have never heard of a power company being sued because an outage resulted in a death. That is worldwide. In Bahrain, I looked after the water supplies, where we had no guarantee of water. You took what was given and you blessed Allah for it, as it was seen as a gift from God.

[164] At some stage, Ofwat will have to make a decision and tell the water companies that sprinklers are a legitimate domestic use of water and therefore the supply should be provided when it is requested. If it is not available, that is a different matter; the house owner or the developer of an estate may have to make a contribution towards the cost of installing additional pipe work, which is the norm anyway. When the Studley Green estate was first proposed, at one stage—and I think that Alan can probably confirm this—the water company in the relevant area had a meeting with John Craig, who was the chief fire officer at the time, and a splendid chap, and it added up the number of houses on the estate and multiplied it by

two, to account for two sprinkler heads operating in each house, and said, ‘We will have to provide an extra 450 cu m of water a minute for this estate’. It was gently pointed out that sprinkler systems do not all go off together. They do not even go off together in the same house. I think that the water companies need some degree of education, and both a carrot and a whip are probably in order, in some cases.

[165] **Huw Lewis:** A GCSE mathematics paper may be needed, in that case. [*Laughter.*]

[166] **Peter Black:** The relevant supplementary question is do you think that the LCO that we are proposing needs to ensure that we have the powers to compel water companies to cooperate? You are not lawyers, but do you think that we have the powers—

[167] **Mr Kidd:** A very simple amendment to the water industry regulations will add domestic, or residential, sprinkler systems to the list of applications that are permitted.

[168] 10.30 a.m.

[169] **Peter Black:** So, we need to ensure that we have that power in the LCO to be able to make that amendment?

[170] **Mr Kidd:** Unless Ofwat were to step in on a non-statutory basis and make a determination.

[171] **Mr Brinson:** In Switzerland, sprinkler systems must be connected to the mains. So, you are not thinking about something outrageous here; it is already a statutory requirement in Switzerland. If, at any time, you would like any confirmation, or to speak to someone in Switzerland about that, I could help you to find a correspondent.

[172] On the other points that Stewart mentioned, there is no reason why sprinkler systems should not be connected to the mains. Several technical objections have been thrown up, but all of them are surmountable, but you may need a stick to push through what you are requiring. The current minimum supply that we are told water companies must provide, of just 9 litres a minute, at 1 bar at street level, is not adequate for domestic purposes, let alone fire safety. You would not be able to put a shower on the top storey of a three-storey house if you had that as your street-level supply. So, that may need to be considered in the round as well. However, I think that you will need a stick. Perhaps not in Wales; it depends, but you should keep it as an option.

[173] **Mr King:** As we are talking about new build, in all probability, most of these will be new water mains, so we should expect a reasonable supply.

[174] **Mr Brinson:** Yes, there should not be a leak problem.

[175] **Huw Lewis:** Janet Ryder has the next questions.

[176] **Janet Ryder:** You have mentioned other countries, including Switzerland. Are there any other examples in other countries, such as the US or Scotland, that we could use as a model?

[177] **Mr Brinson:** In the United States, I understand that water mains are sized to be adequate for firefighting purposes, but that is not included in the calculation of the dimensions of water mains in this country. I know a consultant who has relatively recently moved to this country, and he is astonished to find that that is the case. He did not believe me when I told him, but it is true. So, it is fairly normal in North America—not just in the United States, but in Canada also—for water mains to be of adequate dimensions for firefighting purposes. One

advantage of sprinkler systems in those jurisdictions is that you can reduce the amount of water that is assumed to be needed for firefighting purposes, and thereby reduce the dimensions of the water main, which goes some way towards paying for the sprinkler system.

[178] **Mr King:** Alan has previously mentioned Vancouver and Scottsdale, and if you are looking for models, what they have achieved there probably provides those models of good practice. Some 30 years ago, Vancouver had 40 fire deaths; within 20 years, that was reduced to zero. So, it is 10 years since Vancouver had zero fire deaths, down from a high of 40. Some 37 per cent of all premises now have sprinklers fitted in Vancouver, and that is not just housing, but all premises.

[179] In Scottsdale, more than 49,000 single family residential properties have sprinklers fitted, and 85 per cent of other buildings, so that is a good model. It has already seen a 50 per cent reduction in the number of fire deaths in 20 years, and Vancouver brought it down to nil. Those are two good examples of where we should look to, and perhaps even learn from what steps they took.

[180] **Janet Ryder:** We have heard evidence about the BRANZ system of fire sprinklers used in New Zealand. Can you tell us some more about that system, including any differences between it and the system that conforms to BS 9251:2005?

[181] **Mr Brinson:** I have not been to New Zealand, but I have read the reports and been in contact with people there. I understand that this BRANZ system combines the sprinkler system with the domestic plumbing in a property. That would save a certain amount of pipe work. I am not absolutely certain, but I do not think that the BRANZ system includes the various alarms that you have in the British standard system. Other than that, the sprinkler heads are the same and the flow rate through the sprinklers is the same. So, essentially, you are saving a bit of pipe work and some alarms. That is the main difference.

[182] One other difference is that it is likely, although not necessary, that these systems will be installed by plumbers. There has been a lot of controversy in New Zealand, as well as discussion in this country, as to who will install these systems and whether they will know what they are doing. Plumbers who install boilers must have extra training to ensure safety when they are playing with gas, so there is no reason why the same thing could not be done here. However, it is a concern of the sprinkler industry that, if these systems are installed, whoever does it does it properly.

[183] **Janet Ryder:** Are you considering it for Wales? Is it a model that would work here?

[184] **Mr Brinson:** The information that I get from New Zealand depends on who it comes from, largely; they all have a different point of view. However, I hear from people who are about as neutral as can be that a lot of the systems are not installed by plumbers, because plumbers can earn more money being plumbers than sprinkler fitters. That is probably the case in this country as well. I know what I pay for someone to come and check my boiler, and it is certainly more than you get from being a sprinkler fitter. So, it ends up with the systems being designed and the sprinkler companies doing the work in the end anyway.

[185] Regarding the combination—[*Interruption.*] It may be, in a new system. The difficulty is that you will then have a system that is perhaps a little less reliable than the proven system that follows the British standard. There will not be an alarm on it and you may wish to have one. If a sprinkler system goes off, it is highly unlikely to be a false alarm, but something will happen. If a sprinkler head has opened and water is flowing, it is almost certainly a fire, but, in the very unlikely event that it is not, you still want something to happen. For example, if I am away on holiday for two weeks and the sprinkler system operates, I would like someone to go to my property and do something about it.

[186] **Mr King:** The last meeting of the working group, set up by the Department of Communities and Local Government to look at a combined fire sprinkler system based on the BRANZ system, was in May 2007. I sat on that working group, but it has not met for a year. The design guide that was developed by the Fire Protection Association is now with the department. This system is almost considered as a first-aid system, as it is similar to first responders and ambulances, although it will certainly not deliver 100 per cent or 99 per cent results; it will be less than that, but it will be better than nothing and so it is appealing. The plan, once the department reaches agreement with the water companies, is to roll it out to 30,000 homes in England. Subject to the results of those trials, it might be rolled out far and wide. However, it is a low-cost system, and I think that that could complicate what you are doing in Wales.

[187] **Mr Brinson:** I agree with Ronnie. Perhaps that should to be kept in mind for the future. However, if you link that with what you are doing on this, you may find that you lose a year or two while people haggle over the details, and develop a scheme for training and approving those who install such systems. You really do not want to be hijacked by that process.

10.40 a.m.

[188] **Mr Kidd:** The trade was excluded from the discussions on the development of this, allegedly on the grounds that we might try to stifle it. That is far from the truth. We are very happy to welcome the idea of alternatives. British standards can be written and can be amended. The information that I get from New Zealand and the US, where some of these systems are in use, is that the take-up is small compared with conventional sprinkler systems. Interestingly, if you exclude water costs, the hybrid integrated domestic system is only about 20 per cent cheaper than an equivalent British standard system. I am not convinced that removing the surety and certainty of the British standard system, which will have a high degree of reliability, is necessarily worth the candle. The issue would probably be particularly important only where you had a developer building very large estates who could then bring in specialist contractors to ensure that the sprinkler heads were in the right place, which is important, and that, if, for example, concealed heads were used, tenants were properly instructed that they should not be painted and so on. Those are ongoing maintenance issues. Maintenance will suffer dramatically on hybrid systems because people may not even know that they have a sprinkler system unless it is pointed out to them. There are some issues there.

[189] **Janet Ryder:** You have given us some examples of where it has worked very well, and this might be an example of where it is not working too well. Are there other instances where the policy has not worked very well in practice, and what can we learn from that?

[190] **Mr Brinson:** Which policy?

[191] **Janet Ryder:** The policy of installing sprinkler systems.

[192] **Mr Kidd:** We know of a couple of cases, and we are open about these. There was a fatality last year in a care home. A gentleman unfortunately died in hospital eight days after a fire in his room, which was sprinklered. The sprinkler did operate, but it did not save his life. That is not really a failure, but we take it seriously. There was a case in Bristol, which you are probably aware of, where a fire occurred in an underground car park—

[193] **Mr Brinson:** That car park was unsprinklered.

[194] **Mr Kidd:** Above the car park was a block of sheltered housing flats, which were sprinklered. The fire roared up the outside of the block and popped all of the sprinklers—

which did operate—in each flat as it went up. However, one gentleman could not get out of the flat he was in for some reason, and he died. The sprinkler system in the flat, which was not designed to cope with the car park fire, actually coped extremely well. We take these instances seriously. To call them ‘failures’ would be to use the wrong word, but the sprinklers did not have the effect that we would have liked them to have.

[195] **Mr Brinson:** In that example, the car park should also have been sprinklered. The saving made by not doing so was rather trivial, given that the pump, tank and water supply were all in there. It was a fairly modest saving not to include sprinklers in the car park, given that the rest of the building was protected. There was one fire death in Scottsdale last year, which was the first in 21 years. People often think that, because we always talk about Scottsdale and Vancouver, those are the only jurisdictions in North America that require sprinklers. There are 100 jurisdictions in the Chicago area alone that require sprinklers. So there are actually hundreds of jurisdictions in the United States that require sprinklers in all new housing. There are too many to name, but we name the two that are best known. If I were to name a suburb of Chicago, you may or may not have heard of it. Chicago itself, the centre of the city, does not require sprinklers in all housing, but nearly everywhere around it does.

[196] **Janet Ryder:** In that case, if installing sprinkler systems works so well—and Finland, for example, is considering introducing legislation on this—why have other European countries not done it?

[197] **Mr Brinson:** You could ask why we have not done it. The country in Europe that is leading the way with installing sprinklers in homes is Norway. In 2007, it installed more than half a million sprinklers for a population of 4 million people, which is several times the rate of installation of sprinklers in this country. Not only that, 70,000 of those were residential sprinklers, and, making a rough estimate, that probably means that 20 per cent to 25 per cent of all new homes built in Norway in 2007 were fitted with sprinklers. That is partly because there are many remote properties that are far from the fire brigade and because many properties are made of wood, but also because Norway’s building code imposes a limit of 800 sq m for unsprinklered buildings. If you go above that area size you need to install sprinklers, which effectively means that most new apartment buildings in Norway are fitted with sprinklers. So, the codes across Europe are different in their approach, but the way that they have done it in Norway has led to this result. Norway has a fairly high rate of fire deaths and they want to do something about it. I am afraid that we are not cutting edge as yet in this country, but this initiative would catapult us into the lead, so I welcome it very much.

[198] **Huw Lewis:** Are you content with that answer?

[199] **Janet Ryder:** Yes.

[200] **Huw Lewis:** Okay, thanks for that. We now move on to questions from Sandy Mewies.

[201] **Sandy Mewies:** You refer in your evidence to over-design and under-design in relation to sprinkler systems, and I think that you suggest that the British standard itself is a mechanism that can prevent that. Can you expand on what you mean by ‘over-design’ and ‘under-design’?

[202] **Mr Brinson:** Yes, and I am sure that Stewart will also wish to say something on it. When I talk to legislators, regulators and so on, the objection that they often make to putting sprinklers into buildings is that they are too expensive. I am surprised that, often, when I ask them how much they cost, the answer is ‘I do not know, but I do know that they are too expensive.’. However, every now and then someone says ‘I do know how much they cost—they are this much.’, and I get a figure thrown at me. It is often a very high figure, and the

reason for that is that the person who installed the sprinkler system may never have installed one in a house before—he may be used to installing them in supermarkets, factories or whatever, and he has approached it in the same way. He may have project-managed it and designed it with vastly oversized water supplies and so on, and you have ended up with a belt-and-braces gold-plated design. Following the design standard that we have is one way of avoiding such over-design, because it is a British standard and not a European standard, and the high figures come from other countries rather than this country.

[203] By contrast, other people whom I would call ‘cowboys’ will come along and say ‘I will light a fire in my garage and turn my system on and, bang, the fire will go out—that is fantastic; we will use that.’ Someone who does that is not testing a system—they are trying to demonstrate something, and it is not a real test. Any type of system that is installed should be subjected to rigorous assessment by people who know when people are trying to pull the wool over their eyes. One way to avoid this happening is to follow the design standard, which means that the minimum flows and minimum duration of flows are specified, as are pressures, products and so on, so that you end up with something that the consensus of many experts says will work. So, that is what I was trying to express with the use of those terms.

[204] **Mr Kidd:** I can add nothing to that.

[205] **Sandy Mewies:** We have had some information from you about the various types of sprinkler systems and how they work, but can you achieve an optimum degree of efficiency if you pay more? Is it a case of the more you pay, the better the standard, or can you have a high standard of sprinkler with a lower budget model?

[206] **Mr Brinson:** The intention with the British standard is to achieve that optimum. If you were to compare that with an industrial system, for example, the things that determine the cost of the sprinkler system—without getting too nerdy about this—are the assumed size of the fire and the area of operation. So, one assumes that the fire could get to a certain size so one puts in sprinklers to cover that area. The higher the fire risk—meaning the larger the quantity of material that could burn and perhaps the greater the chances that it could quickly catch fire—the larger the area one assumes must be covered with that calculation. If you are putting water on a larger area, you will need more water, so you need a bigger pipe, a bigger pump, a bigger tank and so on.

[207] Also, if you have a larger amount of combustible material on a particular area, you need not only to cover a larger area, but you will need more water to cover each part of that area, so that also stacks up the costs. With sprinkler systems for homes, we have pared that back to what is appropriate for a home. So, the standards are based on fire tests of standard set-ups of domestic situations, with things such as sofas and so on. The purpose is to show that your system will cope with that situation. It is intended to be a stress case, so it will be based, not on the absolute worst case, but a likely worst case. Manufacturers are free to come along with new technology that does better against these standardised fires. However, the test remains the same. It is a performance-based system.

10.50 a.m.

[208] **Sandy Mewies:** We have heard that one of the principal benefits of the sprinkler system is environmental—its carbon footprint and so on. Would anyone like to expand on that?

[209] **Mr Kidd:** I would like to come back on your previous point first. If you wanted to gold-plate a sprinkler system, you could certainly do so by using, for example, stainless steel pipe rather than copper or plastic.

[210] **Mr Brinson:** You could even have gold-plated sprinklers.

[211] **Mr Kidd:** They do exist; the Queen Mary has silver-plated sprinkler heads, which are still in existence—they have not been nicked yet. You could, for example, put two pumps in for security, or put in one electric pump and one diesel pump. All of those things would be possible. They would not achieve any more than increasing the reliability from 99.1 per cent to 99.3 per cent.

[212] However, the one issue that we are concerned about is that the British standard allows certain areas, such as loft spaces, certain cupboards, and, under certain circumstances, bathrooms, to be unprotected. Some of us in the trade, who perhaps sees both sides of the story, are concerned about this. If your loft is anything like mine, it is a major fire load. When I do a historic house risk assessment, I tell people that I can reduce their fire risk by half if I can bring in 15 empty skips and clear the attic and the basement. The Department of Communities and Local Government's fire statistics show that around 14 fire deaths a year occur as a result of fires starting in lofts and storage areas. So, this is an issue that should be addressed. BS 9251:2005 is up for review this year, and I think that that element will be reviewed. I would draw an analogy with the current work being undertaken on sprinklers for schools, where the original draft of the Department for Children, Schools and Families document on standard specification would have allowed sprinklers to be omitted from lavatories. We pointed out that around a quarter of arson fires in schools seem to start in lavatories.

[213] **Huw Lewis:** I do not want to get too involved in this, as the clock is against us.

[214] **Mr Kidd:** The environmental question is an interesting one. We think that there are three issues. The first is the reduction in the amount of firefighting water that is needed and the amount of contaminated water that is produced. Fire water run-off can be very toxic in some cases. The second is carbon dioxide emissions. We believe that sprinklers can play a significant role in reducing those. A paper has been produced by a serving fire officer from Greater Manchester whose PhD is based on the subject. I am sure that I could get a copy of that for the committee. The third issue is the question of the local environmental impact; a burned-out house is a blight on a community. However, to use the South Ayrshire example, they have had several burned-out kitchens, but the fires have gone no further. The tenant can be accommodated for a couple of days while they re-decorate and put a new carpet in. That limits substantially the impact.

[215] **Mr King:** I would like to relate some specifics on environmental benefits. Some tests were carried out in 2005 in France. The conclusion reached was that a building with sprinklers would reduce carbon dioxide emissions by a factor of 3,000; firefighting water by a factor of 230; hazardous chemicals entrained in the firefighting water by a factor of 53; and carbon monoxide by a factor of 1,000. Airborne particles and soot levels were 19,000 times lower. Those tests were pretty specific and precise and would certainly be worth using, because they are an authentic test and are what we would use to prove the environmental benefits.

[216] **Huw Lewis:** I am aware that the clock is relentless, but we want to cover all the ground in terms of our questions. I ask questioners and witnesses to be as concise as possible, as we enter the last 15 minutes or so of the meeting.

[217] **Sandy Mewies:** We have been told that the chances of a sprinkler systems failing are pretty small. Does that depend on regular maintenance? What happens if they are not maintained? How important is the issue of maintenance in this LCO?

[218] **Mr Brinson:** I will have a go, without being specific on numbers. Qualitatively, as

with any other system, you need to maintain it. We are not saying that sprinkler systems are inherently unreliable and need huge amounts of maintenance, because the message is that they are robust. Nevertheless, you cannot leave them for 10 years and then hope that they will work. They might well do, but that is not the right way to go about it. With these domestic and residential systems, there are relatively few parts and they are relatively simple. In these systems, the pipework is filled with water—we call them wet-pipe systems—and they are inherently more reliable systems, less prone to corrosion and all of those problems. Nevertheless, there is, in the British standard, a programme of maintenance that is recommended, and we believe that, if you follow that, you will get reliability in the very high 90s in terms of percentage—somewhere around 99 per cent. If you do no maintenance at all, it is difficult to say what will happen. We have no data for jurisdictions where no maintenance is done, like Italy, because no data is available for anything at all in those jurisdictions. However, you would expect them to be less reliable.

[219] We know from the United States that the most common cause of failure in a sprinkler system is simply a valve being closed. So, with regular inspection, if a valve were inadvertently closed, hopefully, someone would see it and open it. In addition, in a domestic situation, you want to ensure that the sprinklers are free from obstructions and so on.

[220] **Mr Kidd:** Hong Kong is a good example of—again, this is not domestic, but commercial—a place where there is a legal requirement to maintain systems. There is a system of licensing contractors, who submit copies of their test and maintenance certificates to the fire service, which then counterchecks them. Their reliability is in excess of 99.8 per cent. In the UK, we get 99.1 per cent, if you exclude systems where the water has been turned off deliberately or where the system has been interfered with. In the domestic context, the only maintenance is an annual inspection. If you have a pump system, the sprinkler pump unit has a self-test facility; it turns itself over every 28 days to prevent the pump impeller from sticking, and there is an in-built water reservoir that holds a volume of water to prevent the pump from starting and stopping due to pressure surges. The only other issue with domestic systems is the question that I mentioned earlier of painting the heads. If you have concealed heads that are flush to the ceiling, it says on them in engraved letters, ‘Do not paint’. Clearly, if they are painted, that could prevent the head from operating; it would operate, but perhaps not as quickly as it would otherwise operate.

[221] **Sandy Mewies:** This question is focused, in the first instance, at Mr Kidd and Mr King, whose submissions say that evidence shows that it is easier for people in care homes to get around if sprinkler systems are installed. Can you expand on this point and say whether it gives greater design freedoms or cost-saving opportunities?

[222] **Mr Kidd:** There are multiple design freedoms and multiple benefits. The current Approved Document B permits that door closers can be omitted from the residents’ rooms in care homes, which is a huge benefit. I speak as someone who has had both parents in care homes until recently. Secondly, there is a reduction in the compartment fire resistance, which is a cash saving to the owner. The most significant benefit is one that you cannot quantify, namely the evacuation requirements. If you take the staffing levels that one currently sees in some care homes, there is absolutely no possibility of evacuation taking place without fire-service intervention. That may or may not happen quickly enough.

11.00 a.m.

[223] There was a fire recently in Teesside, where a resident died because they were forgotten about; when the care home staff were questioned by the coroner, two of them said that they had never been told what to do in the case of fire. Quite frankly, in a care home fitted with sprinklers, that would not be an issue, because you would simply evacuate the room where the fire is burning and perhaps the rooms either side, or all the rooms in that

compartment. The other residents could safely remain in situ. So, there are cost benefits, operational benefits and huge benefits in the idea of mobility, getting around the home if you use a frame or a wheelchair.

[224] **Mr King:** I could not add to that.

[225] **Huw Lewis:** Okay. Sandy, are you content with that? I see that you are, so Mark Isherwood will ask some questions.

[226] **Mark Isherwood:** My first question is to Mr Brinson. Why do you think that the meaning of new residential premises and sprinkler systems should be set out in the proposed Order rather than in a future Measure?

[227] **Mr Brinson:** As I wrote in my evidence, I am not a lawyer, but I do know that, when we talk about sprinkler systems in people's homes, there is often confusion about domestic and residential. This is the sprinkler industry's fault, actually, as we tend to make a distinction between 'domestic', which means a house for just one family, and 'residential', which means perhaps a small block of flats where you have different properties in the same building. I think that it is your intention that both types of property be fitted with sprinklers. Given that this confusion arises, I think it necessary to spell it out, to be as clear as possible.

[228] **Mark Isherwood:** Do you not think that it will have a limiting effect on future Measures, especially if the definition of the British standard is revised at some point?

[229] **Mr Brinson:** The British standard splits properties into two types: a single family house, and all the others, effectively. The impact of that is that, if it is a single family house, you are designing with two sprinklers, and if it is all the others, you are designing with four sprinklers. There is a basic-cost difference for such a system. If you are following the British standard and you make it clear that you wish it to apply to domestic and residential properties, that should cover it.

[230] **Mark Isherwood:** Thank you. Mr Kidd, you state that it might be simpler to tie this part of the Order to the existing application of building regulations, which define closely the premises to which they apply. Can you expand a little on that and say, in particular, which elements of the building regulations you are referring to?

[231] **Mr Kidd:** It is to do with the purpose groups. Essentially, I believe that the avenue to follow is to do this on a risk basis. Ample data suggest that the risks are higher in houses in multiple occupation than in single family dwellings, and they are higher in care homes than in residential blocks of flats. There are not more fires in those premises, but when the fires do occur, you tend to get more casualties; Rosepark Nursing Home was a horrible example, with 12 dead at the scene and two dying later. I guess that it is something that parliamentary draftsmen have to look at in more detail when they are writing the regulations, but I do believe that, if you twist it around and talk about all premises used for occupation, and then define that in purpose groups, following the building regulations and the planning regulations, this will cover, for example, the conversion of a hotel to an HMO, which is quite a common thing these days. There was a fire in a Great Yarmouth hotel the week before last, in which 54 people, who were essentially DSS clients—'social security tourists', I think, is the term used in holiday and seaside resorts—had to be evacuated and then accommodated by the local authority in temporary accommodation, and then found other accommodation fairly quickly. There is a huge number of issues there.

[232] HMOs would certainly come in to play if you covered it using the building regulations. It would also be covered if you have purpose-built HMOs, such as student flats. We in the UK do not think about this area with regard to sprinklers, but the US does, and for

good reasons. My association is currently campaigning strongly to convince the Department for Communities and Local Government to bring care homes under the building regulation requirements for sprinklers, to follow Scotland's example. We believe that there are significant issues there. I think that it is 27 deaths over 10 years in care homes in England and Wales, and something like 1,400 injuries. Those are problems that are not being addressed. Mind you, it is much worse elsewhere—in France, for example—but I believe that it would be simple enough to require sprinklers in new premises or newly converted premises. In order to avoid confusion, I think that you should follow the established purpose groups in the building regulations.

[233] **Mark Isherwood:** I have a question to each of you, although Mr Kidd has largely addressed it already. If the Order is to cover blocks of flats, HMOs, care homes and so on, why do you think that the proposed definition is insufficiently clear?

[234] **Mr Kidd:** I believe that it is clear. Like Alan, I am not a lawyer, but I do a fair bit of drafting. I have drafted on British standards and American standards committees for 30 years, and I have chaired European working parties. I guess that you draft as you see the loopholes, and you try to avoid them by making things as clear as possible. Unfortunately, the parliamentary draftsmen then get hold of it—in Brussels, I believe that they say that the common working language is Obscuranto. Perhaps I am being a little unfair.

[235] **Mark Isherwood:** I thought that it was goldplateitis. Does Mr Brinson or Mr King have any comments on that?

[236] **Mr King:** We have said that we needed to be certain that the wording did not miss anything. It just says that there is a requirement to install sprinklers in 'new residential premises', and interprets that as 'constructed for residential use' or 'converted to residential use', with the emphasis being on 'residential'. We felt that we should be sure that that included blocks of flats, houses of multiple occupation, sheltered housing and care homes, which we think are all valid types of building, given that most of our vulnerable people live in those kinds of premises. I mentioned the 244,000 people suffering from dementia who are in care homes, out of 700,000 suffering from dementia overall. I did not want to feel that the legislation did not cover those vulnerable groups.

[237] **Huw Lewis:** Are you happy, Mark?

[238] **Mark Isherwood:** Yes.

[239] **Huw Lewis:** Finally, I have a few questions of my own. The fire and rescue services have suggested changing the wording of this Order to provide for 'an automatic water suppression system', instead of using the phrase 'sprinkler system'. You might have touched on this earlier, but just to be clear, what is your view on that?

[240] **Mr Kidd:** At the moment, there is only one approved, British standard water suppression system, and that is the sprinkler system. There is an increasing interest in the use of water mist, but at present, there is no British standard for such systems. I would certainly not object to using the term 'automatic water suppression system', and the Scottish legislation specifies an 'automatic fire suppression system'—it does not restrict it to water. I do not believe that any gas, chemical or foam systems are suitable for domestic use, but one day they might be. We would certainly have no objections. The only requirement that we would hope to see would be that such systems should comply with British standards, as should the components used in those systems.

[241] **Huw Lewis:** That is very clear and to the point. Finally, you say in your evidence that the Order should specifically refer to

[242] ‘sprinklers for residential and domestic premises designed and installed in accordance with BS9251’.

[243] **Mr Kidd:** Or its successor standards—because it will change this year.

[244] **Huw Lewis:** Yes—you mentioned that. Just as we were getting used to it as it was.

[245] **Mr Kidd:** There is a lot wrong with it, I must say.

[246] **Huw Lewis:** In any case, do you think that that is a matter for the Order, or should it be left to a future Measure?

[247] **Mr Kidd:** You could say ‘in accordance with the relevant British standard’, and not mention a standard specifically. I find that it is always better to go for the general rather than the specific when you are drafting.

11.10 a.m.

[248] **Huw Lewis:** That is a good tip. We are coming to the end of our session. Is there anything that you have felt, being brief and to the point, that you have not been able to get across during questions that you would like to mention now?

[249] **Mr Kidd:** On my part, no. We thank you for inviting us. I express our appreciation for the committee’s work and for the Assembly’s work. In particular, I thank Ann Jones for her pioneering work. I am sure that she did not know that it would be this daunting when she started it.

[250] **Huw Lewis:** It is nice of you to thank us, but it is the committee that should thank you for your time, for the journey that you have made today and for this informative session. I thank you, the Members, those in the public gallery and others. The meeting is now closed.

*Daeth rhan gyhoeddus y cyfarfod i ben am 11.11 a.m.
The public part of the meeting ended at 11.11 a.m.*