2016年2月18日

上午9時32分恢復聆訊

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PROF JOHN FAWELL (on former affirmation)

Cross-examination by DR WONG (continued)

(All questions and answers in English)

DR WONG: Good morning, Prof Fawell.

The topic that I would like to explore with you next is your suggestion to add three more chemicals for

testing in the water sampling.

A. Yes.

Q. Let me make it clear first, the stance of the WSD is that they are very welcome to considering any additional chemical to be tested. So it's not that we are resistant to any suggestions. They are suggestions only. Just so there is no misunderstanding on that.

We would just like to understand the rationale, the basis for inclusion of the three additional metals. First, you suggest the inclusion of zinc.

A. Yes.

Q. If we look at your paragraph 69 in your report.

A. Yes.

Q. There you say that zinc is unlikely to be present unless galvanised pipes are present.

A. That's correct. Usually zinc comes from galvanised pipe. I know that galvanised pipe was used in the past in Hong Kong.

Q. In Hong Kong. So in terms of risk assessment, since Hong Kong has not used galvanised pipe for quite some time, in terms of assessing risk for inclusion of

another heavy metal into the sampling, testing, what is your thinking behind the inclusion of zinc?

A. My thinking is that because the galvanised pipes were used in the past, that an investigation, in other words, for a short while, as samples are being taken, then to look and see if zinc is present. If zinc isn't present in significant concentrations, then it can be dropped. But then the WSD have got the information and they are not surmising that zinc may or may not be present; they actually have facts that allow them to say, "We have looked and we can show that it's only present in very, very low concentrations, it's not a problem" and they can always check also -- well, they are checking -- with the raw water, I hope.

Q. Yes, perhaps out of an abundance of caution?

A. Yes.

Q. Talking about data, you know that Prof Joseph Lee has conducted a rather detailed research.

A. Yes.

Q. One of the parameters that he finds is about the level of copper --

A. Yes.

Q. You know the figures; right? It's at page 173.13 onwards. If you want to have a look, V1/173.13.

There is nickel, copper, lead, et cetera; right?

A. Yes.

Q. As far as lead is concerned, I don't think we have any disagreement here that lead is health-based; right? That level is health-based; right?

A. Yes.

CHAIRMAN: The level is?

DR WONG: Health-based, the guideline value for copper is health-based; right.

Prof Lee has done a rather detailed analysis by way of his sampling protocol.

A. Right.

Q. And the level of copper found is less than --

A. It's very low.

Q. It's very low; right?

A. Yes, it's very low. But in the future you would be looking at other circumstances, and it may not be the same. I'm not thinking just about these housing estates, but in the future there will be new

developments, new buildings. There will be private buildings, and so on. There are circumstances -- it's almost invariably when the building is new that levels of copper can, particularly if they have been standing for any length of time, actually get up close to or above the guideline value.

When that happens, it can cause some difficulties. Now, an example would be that I was dealing -- I have dealt with it in various parts of the world, but in a part of England where they have been installing new copper pipes into schools -- of course nobody is in the school over the weekend, so the pipes -- the water is standing in the pipes. It's quite aggressive water, so it could dissolve the copper. And on a Monday morning, when the taps were turned on at the drinking fountains, at break-time for the children, there were actually very high levels of copper, enough to make them feel uncomfortable and not very well. But that flushed through very quickly.

It was a case of managing the situation for a few months, and then it settled down and there wasn't

a problem.

So it's just being aware that these things can happen, because when you have potentially a new building, and if people start to report that they are not feeling very well, which sometimes happens, for a range of reasons, you have information that will tell you it's likely to be the water, it's not likely to be the water, and so on.

Q. Okay. Thank you.

Lastly, about antimony.

A. Yes.

Q. If I may invite you to go to C2/1412. That's the WHO document which you are very familiar with.

A. Yes. The WHO Guidelines. Okay. I pretty well know that one.

Q. "Antimony is used in solders as a replacement for lead ..."

A. That was a proposal at one time. That has not happened.

Q. If that has not happened, your thinking about the risks of antimony to exist in the Hong Kong drinking water system --

A. Well, it hasn't happened. We specifically did a guideline because that was a proposal and it was important to have available the information so that judgments could be made. But since then, we also know that antimony is seen at low levels in various distribution systems, presumably as a contaminant in various alloys. Certainly we see concentrations in Europe that approach 5-plus micrograms per litre.

If it's present, it would be useful for WSD to know whether or not it really is present, and so some analysis, in order to determine whether it's found in Hong Kong at the tap, would be valuable.

It's not something I'm proposing that would be added for lots and lots of analysis. But you have the capability in the WSD, and the knowledge of the system is part of water safety plans.

Therefore, I'm suggesting that Hong Kong -- these are found elsewhere -- Hong Kong should find out what sort of levels, if any, of antimony are here.

Q. That's a very good and cautious judgment.

The last topic I would like to explore with you is

that you have been referred to a Benchmarking Study of Overseas Regulations, which is at C19.6.

A. Yes.

Q. There's one paragraph in that Benchmarking Study that I would like your assistance on. That's paragraph 2.5.3 on page 14411. That's talking about the practice in England, or the UK, about the approval of new plumbing work, at page 14411, 2.5.3.

A. Yes.

Q. The system in the UK, or in England and Wales, is that whenever there is completion of new plumbing works, then -- "TW" is a water company; right?

A. That's exactly right. This is dependent on the water company. This is not a statutory scheme. The companies would prefer to have -- they are in the position that they cannot insist on an approved plumber being used. The Water Safe scheme is fairly recent and has been promoted by the water suppliers, in the absence of any action from government, in order to, to an extent, mirror the scheme in Scotland. They have put together a scheme where there is training and a plumber can be

approved.

That's slightly different to Hong Kong, because in Hong Kong you have a licensed plumber and then you have a whole series of other plumbers. And in the UK, often it's all one group.

Q. In the UK, "approved plumber is used", and then "Taps certificates provided simply needs to be sent to TW with a pressure test and chlorination certification (self-certify)."

So I want to ask you and to tap on your experience: why is it that you need a self-certification by approved plumbers, as far as new buildings are concerned?

A. It's part of the process of making sure that things happen, but to minimise the amount of work that's involved by the water company. The water companies have fittings inspection teams, and they have to ensure that the bylaws -- this is the WRAS scheme -- are being met. That means inspecting backflow devices, the way the plumbing is put in, the materials that are used, et cetera.

It only goes so far, because of course once you get into the house or into a property, they have limited powers in that respect. They can insist that anything that's used up to the point that it enters the property is a particular material, approved material, and they can advise within the property, and they do advise, because one of the things they don't want is water quality problems occurring because of the materials that are used, incorrect materials, and they can say to the consumer, "Sorry, it's your problem, you used the wrong material. It's between either you and your plumber or you, yourself, to fix it", and they will not be held responsible.

So if somebody did repairs in their house and used leaded solder, the water supplier would not be responsible for that. So if they found lead in a sample of water, and the fittings inspectors have been around and said, "They have been using leaded solder", the water company can say, "This has nothing to do with the water supply or with the normal piping; we don't have any responsibility for this. We don't have to put in treatment or anything; this is a problem for the

particular householder."

So it's a little bit more complex than in Hong Kong, but in the UK we don't have the same sort of big public housing set-ups that you do in Hong Kong.

Q. Sure.

A. And obviously we don't have these very high-rise buildings.

Q. Sure, sure, sure. This system would rely, would you agree, to a very large extent, on a trust on the approved plumbers to certify that? Because they have to self-certify themselves and the water company --

A. Well, they self-certify on chlorination -- the pressure test and the chlorination. But the plumber has been certified beforehand.

Q. Yes.

A. So a certified plumber would do the various tests and then send the paperwork to the water supplier. And yes, they would rely on that certified plumber doing the right thing.

If the plumber is found not to have done the right thing, then he has two problems. One is his

certification will be removed by the water supplier, and that information will go out that this is no longer a certified plumber, which will mean he's going to have difficulty getting business. And the second is that his clients that he's been working for will be in a position that they may well be able to take him to court for breach of contract.

DR WONG: Okay. Thank you very much, Mr Fawell. I have no further questions for you.

Cross-examination by MR HO

MR HO: Professor, good morning. I represent the Housing Authority.

A. Yes.

Q. I hope what I'm going to ask you perhaps to a large extent is actually pushing some open doors, but do bear with me.

Professor, I have noticed first of all, in your reports, at different parts of your report, you have actually used terms like "Housing Authority" and "Housing Department". Now, I don't know if this is an intended distinction, because the report actually

talks about roles and responsibilities of various parties. I don't know whether, in so doing, you are making a conscious distinction or whether in fact the terms are quite interchangeable?

A. They are largely interchangeable.

Q. Right.

A. When I visited, in talking to people from the Housing Department, they were using the terms "Housing Department" and "Housing Authority" reasonably interchangeably.

Q. Sorry. I just want to make sure there's nothing, difference in terms?

A. Yes. It wasn't very clear, the differentiation, and I wonder whether in many respects there is a need for that differentiation, just how important it is.

Q. Probably not. I just want to make sure that I understand the situation.

The one aspect that I want to try and ask you to elaborate a little bit upon is the part where you talk about the concept of water safety plans.

May I direct your attention to paragraphs 35 and 36

of your report, please.

A. Yes.

Q. Towards the middle of paragraph 35, you were referring to:

"The concept of water safety plans was introduced in order to encourage a proactive preventive approach to managing risks to drinking water from the catchment to the point at which consumers receive their drinking water ..."

And you use the term "source to tap approach".

A. Absolutely.

Q. There is a helpful reference to one of the papers -- I will take you to that in a moment -- but if I may, just for the time being, go to your next paragraph. In paragraph 36 you say water safety plans require several things. I pick up the key words here as being, one, system assessment --

A. Mm-hmm.

Q. -- from catchment to tap; two, identification of hazards.

A. Yes.

Q. Three, assessment of risk; and following, in line 5 onwards, then recommendations of supporting activities such as ensuring materials in contact with drinking water do not cause degradation of the quality of the supply. So supporting activities there.

A. Right.

Q. Do I understand that these are sorts of concepts or terms actually used in that paper, which I go back to your paragraph 35 at the end -- in fact, those are the sorts of thinking incorporated in that paper?

A. Yes.

Q. Basically, your summary -- your paragraph 36 is a summary of the things in that paper, isn't it?

A. Yes.

Q. May I take you to the paper then?

A. Right.

Q. It's in bundle A3, and chapter 4 -- page 1687, please.

I don't think counsel for the Commission has actually taken you to this paper when you went through the report in some detail. So if you would bear with me --

A. Yes, that's right.

Q. -- let me try and take you through this paper.

A. Yes.

Q. Now, page 1687, that's the chapter 4, on water safety plans.

A. It is.

Q. That's your "source to tap" approach?

A. Yes.

Q. If I may ask you to look at page 1687, just the head under that chapter. Basically, the first paragraph says -- well, if I understand correctly, these water safety plans are basically risk managements?

A. Yes.

Q. Basically, it's to identify risk, identify hazards, identify how to control these risks, control these hazards, and then have a management plan for --

A. Absolutely. You identify what the hazards are. You assess the risks that those hazards will cause problems. Then you have plans and steps in place that will either mitigate or manage the risks.

Q. Right. There seems to be, as a layman reading this paper, to be a very helpful figure at the next page,

1689.

A. Yes. Mmm ...

Q. This sort of flowchart -- really, for me, it summarises what this chapter is about.

A. Yes. It was intended to do that. You have to be careful not to be too rigid about this.

Q. No.

A. We have had some difficulties with it. You've got to remember that this is written by experts, and experts are not always the best communicators.

Q. You must be the exception, if I may say so.

But by and large, what I get from this figure, following the direction of the arrows, what you have is, for example, you first assemble the team --

A. Yes.

Q. -- to prepare these water safety plans.

Skipping the documentation part, because it comes back right at the end and it comes back in a circle, but skipping that for the time being, then this team, in the third box, they are supposed to do a hazard assessment; identify risks, basically the risk assessment approach;

characterisation of these risks.

I suppose then "characterisation" meaning, "Is the risk high or low or what?"

A. Absolutely.

Q. "Can we ignore this for the time being, due to resource considerations", all that?

A. Yes, prioritisation and so on.

Q. Prioritisation and all that.

Then, moving down to the fifth box, another bold highlight is "control measures". Having identified risk, then you identify what are the control points and how can we --

A. Absolutely.

Q. -- effectively address the risk.

A. Absolutely.

Q. In those two boxes -- I will take you to the relevant parts in a moment, because on the right-hand side you see a reference to section 4.1 and 4.2, those two references.

But if I may just move down that chart for the time being, there you have a box for monitoring, you have

a box for verification. I suppose that's your control, verification, to see if the control measures are --

A. Yes. The verification is making sure that your control measures are working.

Q. That's right.

Then lower down that box you come to "supporting programmes".

A. Yes.

Q. If I may just read out also the words in brackets:

"(eg, training, hygiene practices, standard operating procedures, upgrade and improvement, research and development, et cetera)."

There is more elaboration on that in section 4.4. I will take you to that in a moment.

A. Yes.

Q. Then "Prepare management procedures", and then "Documentation", and then coming back to the documentation in the first place.

Now, I will ask you about supporting programme in a moment, but perhaps I leave that for the time being, because first I may want to go to 4.1, first.

If you turn over the page to 1690.

A. Yes.

Q. Now, this is your -- sorry, not "your" -- but this is the hazard assessment and risk characterisation part, another part?

A. Yes.

Q. 4.1, the first paragraph says this:

"The first stage in development [the water safety plan] is to form a multidisciplinary team of experts with a thorough understanding of the drinking water system involved. Typically, such a team would include individuals involved in each stage of the supply of drinking water, such as engineers, catchment and water managers, water quality specialists, environmental or public health or hygienist professionals, operational staff and representatives of consumers. In most settings, the team will include members from several institutions, and there should be some independent members, such as from professional organisations or universities.

Effective management of the drinking water system

requires a comprehensive understanding of the system, the range and magnitude of hazards ..."

Perhaps I will come to that in a moment. But coming back to the first paragraph, this multidisciplinary team of experts -- now, I can see that the first few categories, these of course all have their own expertise, like engineers or hygiene professionals, water quality specialists and so on?

A. Yes.

Q. These are highly specialised experts?

A. Reasonably specialised, yes.

Q. "Reasonably specialised". And the whole purpose is to actually tap on their expertise here?

A. Absolutely. It's essential.

Q. Yes, and because of that expertise, they would be able to identify where the risk is, where the hazards are, and so on?

A. Yes, and it's important that they have practical involvement, because there's no point in having a totally theoretical water safety plan. We've got that here. What they need is something which is practically

delivered.

Q. Yes.

A. So they will have knowledge of the system as it is operated.

Q. Right. Now, then it brings me to the composition. Then you have an element of consumer there.

A. I think I know where you are going.

Q. Not necessarily.

A. I hope you are going down this way because I have some quite strong views on it.

Q. You do?

A. Yes.

Q. Perhaps you'd mind sharing with us?

A. I commented in the report that I was concerned about -- it wasn't clear how many external stakeholders from WSD had been involved in developing the water safety plans.

I would regard the Housing Department as one of the key stakeholders for the part -- or for knowledge of the systems within buildings, and although it's very difficult for a water supplier to produce a water safety plan for covering every single building, it's very

important that there is an input, with knowledge about the types of buildings, what's in the buildings, how they are operated, how they are managed, et cetera.

Q. Yes.

A. And from what I've seen of Hong Kong -- in the UK, we would have a number of groups, but particularly the environmental health officers, who are local authority people, and they've got responsibility for the health side of the buildings. In Hong Kong, it appears to me that the Housing Department are actually very well placed to provide a focus for that particular part of the process, and it is important to be aware of what will happen within the buildings.

That doesn't mean that WSD suddenly get a massive increase in what they've got to do, but they need to understand that part and work with those stakeholders who are responsible for the buildings.

Q. Yes. Essentially, the experts would of course then contribute to their expertise, to devise -- first of all, to identifying hazards, telling us characteristics of particular risk, high/low, something that you need to

pay a lot of attention to or something that you can basically put aside for the time being.

A. Yes.

Q. And then introduce control measures. But then I agree with you to the extent that of course then you need the users' perspective, which of course injects a degree of practicality to the whole exercise. You don't want just very high-level experts --

A. No, no. It has to be much more detailed than that --

Q. On the ground?

A. -- otherwise it --

Q. Something that can be --

A. Yes, because otherwise it's not going to achieve anything.

Q. That's where the users' contribution would be most useful?

A. It would indeed.

Q. Yes.

A. And we've operated like that in a number of countries.

Q. Yes.

A. Including ones where we don't have piped water supply

actually to taps in houses, where you've got external systems, and it still works -- in fact even more important in many respects there. But there are different ways of doing it and I have made recommendations in here about building management plans, which I would see as being particularly for the public housing, but I think Hong Kong has to look and see how this would apply to private systems as well, but building management plans, as effectively the landlord, for building managers to operate.

For example, we have an issue of the potential for Legionella, and that is very important that that is managed properly.

Now, I don't know what the regulations are in Hong Kong. I haven't gone into detail in the overall regulations with regard to Legionella and other parts of buildings, other types of buildings, and air-conditioning systems.

Q. No.

A. That's normally where we look at Legionella. But we are

understanding that Legionella in buildings is much more of an important issue than we had thought before.

Q. The long and short of it, the point that I want to see if you can help us, in this paragraph, about the composition of this multidisciplinary team -- they are of course people who are there to contribute their expertise?

A. Yes, they're not there just because of their status.

Q. Not just because of their status, but actually their knowledge and expertise?

A. Yes.

Q. And actually they are the best-placed people to make that contribution?

A. Yes.

Q. And there is of course the users' perspective, to ensure that when something is devised or even discussed, that is something that works on the ground and not something up in the air --

A. Absolutely.

Q. -- or theoretical, and so on?

A. Yes.

Q. So the contribution of these different people on that committee is different?

A. Yes. They are not actually going to be normally -- well, there may be people who are operating the system. It just depends how it's done. It can vary under different circumstances. It does mean that it provides an opportunity for the different groups to actually communicate.

Q. Yes.

A. And for example the current situation that we've had in Hong Kong may have been avoided if there had been that sort of communication between the different departments.

I understand it's difficult, in different set-ups, and where you've got two different departments, separate departments, government departments, then sometimes getting those departments to be able to talk together is

difficult, and I am painfully aware of the shortfall in the United Kingdom, where sometimes our government departments will not communicate with each other.

Q. This is perhaps something I will explore with you at

a later stage. But I notice you use words like "department". But anyway, this is perhaps where HD and HA may have a difference.

A. Yes.

Q. But I understand what you say.

May I move on then to the second paragraph. Basically, there it talks in terms of hazards --

A. Yes.

Q. -- as you see in the first sentence, "range and magnitude of hazards that may be present and the ability of existing processes and infrastructure to manage actual or potential risks". Then the last part of that paragraph:

"... the first step in developing a WSP is the collection and evaluation of all available relevant information and consideration of what risks may arise during delivery of water to the consumer."

A. Yes.

Q. So again very much a focus on risk and identification of hazards.

A. Yes.

Q. Over the page, in the box, at the top -- again, the same point, isn't it?

A. It's exactly the same, yes.

Q. Risk management, hazard identification, identification of hazardous events and risk. Again, basically the same point?

A. Yes.

Q. Then the first sentence after the box:

"Assessment of the drinking water system supports subsequent steps in the WSP in which effective strategies for control of hazards are planned and implemented."

Now, of course this now goes into a little bit about control after the identification of risk.

A. Yes.

Q. Right. But of course in this section, 4.1, if I again come back to some key points there, basically it's identification of hazards, identification of risk, assessment of that risk, and characterisation?

A. Identify the hazards and assess the risks.

Q. Assess the risks.

A. You don't need to identify the risks. If you have a hazard there, you need to understand what the risk is, and that risk could be a risk to health, it could be a risk of exceeding a drinking water standard or a guideline.

Q. Yes.

A. There are a number of things -- it could be something that will cause taste and odour or something, so that consumers would not find the water acceptable.

Q. Yes. Then characterising that risk?

A. Yes. At this stage, you would be wanting to record what barriers, what processes were there, if they were physical. So if you've got -- further up the system, you've got water treatment in place, then that's part of what you are recording within the system.

So when we come to buildings, you have requirements for non-return valves, et cetera. So that's part of the overall recording of the system.

When it comes to recording how things operate, diagrams of the system in buildings, that obviously

becomes a lot more complex, and it actually is quite beneficial to have -- where you've got somewhere like Hong Kong, where you've got buildings that are so large, to have an idea of how those buildings operate, how the distribution system operates, et cetera.

Q. Your last point would be that somehow this body of representatives would be best positioned to actually assess that?

A. It would --

Q. To look into it?

A. There would be somebody who would have expertise who would bring that to the table.

Q. Right. May I move on to 4.2 now. This is about control of the risk and hazards.

At page 1707.

A. When you go through this, you realise just how long these documents are.

Q. Indeed, it doesn't make it easier for anybody, administrators, to actually go through this document.

A. I will take that message back to the WHO.

Q. But the flowchart is very helpful though.

Anyway, under the box in 4.2, you have this sentence:

"The objectives of operational monitoring are for the drinking water supplier to monitor each control measure in a timely manner to enable effective system management and to ensure that health-based targets are achieved."

The point that I pick up from that paragraph -- here, it certainly put the emphasis on the drinking water supplier to monitor?

A. Yes, but this is monitoring, the operational monitoring, the barriers that have been put in place, and it's not just the water supplier, because it's recognised that it

may not be within a water supplier's control. So maybe somebody else has got to do that.

What's important is there's some co-ordination.

Q. Right.

A. That is really important.

Q. Right. I do understand the engagement of stakeholders, which you mention several times in your report. I do

understand that.

But here, for example, I take it that the emphasis put on the drinking water supplier is that this is the authority or the department that should take the lead?

A. They should take the lead.

Q. Yes.

A. But it's recognised that the sorts of barriers and operational controls within buildings are not usually under the control of the supplier. So a lot of this relates to the way that the treatment works are operated, the way the distribution system is operated.

Q. Yes.

A. So you've got to be careful not to overinterpret this all the way through to the tap.

Q. Yes.

A. But the principles are still there.

Q. Yes.

I then look at 4.2.1 and 4.2.2: laying down control measures, to address the nature of hazards and magnitude of the associated risk; 4.2.1, still, in the second paragraph:

"Control measures should reflect the likelihood and consequences of loss of control."

4.2.2:

"The parameters selected for operational monitoring should reflect the effectiveness of each control measure ..."

So it's still part of that philosophy of, having identified risk, then you put in the control measures and you put in the parameters, you select your parameters to address the risk by way of these control measures, to make it effective?

A. Yes. You put in a control measure, and the operational parameter is telling you -- it's how you monitor -- the system that you've put in place, the barrier you have put in place, is operating, and it can be a whole range of different things.

If we take a very simple example outside of a building, if we have a small supply in a developing country, and they have a well, and animals can access that well, you put a fence around it to prevent ...

So the operational monitoring is checking that the fence is operating, is there, intact, and that somebody

shuts the gate all the time. It can be as simple as that. Or it can be at complex as looking at, as I mentioned yesterday, continuous monitoring of turbidity on filters in a treatment works.

Q. I presume all these operational issues, for example, like shutting a gate, the fence to a well -- this sort of thing would have been discussed in that rather high-level, multidisciplinary committee, to set up -- to address or to devise the water safety plan?

A. Yes, but it's not so high-level, because you have practical people involved.

Q. Right.

A. If you don't have practical input, then invariably it's likely to become very rarefied and not very real. The key thing about water safety plans is they've got to be real and --

Q. Practical?

A. -- they've got to deliver practical benefits.

That's an interesting one for buildings, but you have to have people who understand the buildings, to be

able to devise sensible ways of doing this.

Q. At the moment, I'm still sort of discussing this in a rather abstract manner, because obviously this paper can only talk about, you know, things that are more abstract, because it's meant to be read by not just Hong Kong people or Hong Kong circumstances --

A. This is the whole world.

Q. Yes, a much broader audience here. So at the moment I'm still sort of exploring with you the philosophy behind this.

Perhaps in a moment maybe we can get down to something more specific.

But if I may turn now to the supporting programme.

A. Yes.

Q. You see further down that flowchart --

A. Yes.

Q. -- you have a section of developing supporting programmes.

First of all, I note, in your report -- just now, when I was reading to you paragraph 36, you did use the words "supporting activity".

A. Supporting programme.

Q. In paragraph 52, at page 111 of your report -- paragraph 52, that's the head.

A. Yes.

Q. The second line, going on to the third line, you see you have also used the term:

"Supporting programmes would include systems for ensuring that only appropriate materials are used both in terms of approval and ensuring that only approved materials and chemicals that meet the appropriate quality criteria are used."

So you also use the term "supporting activity", or "programme", it doesn't really matter; it seems it's referring to the same thing?

A. Yes. It's pretty well interchangeable.

Q. But you put the control of materials as a supporting programme?

A. Yes.

Q. If I may ask you to look at a supporting programme. Page 1721. 4.4.5 -- do you see that?

A. Yes.

Q. Now:

"Many actions are important in ensuring drinking water safety but do not directly affect drinking water quality and are therefore not control measures. These are referred to as 'supporting programmes' and should also be documented in a WSP.

Supporting programmes could involve ... "

And it is the second bullet point that perhaps is of relevance to us, the second and fourth:

"-- developing verification protocols for the use of chemicals and materials in the drinking-water supply - for instance, to ensure the use of suppliers that participate in quality assurance programmes".

Then the fourth point:

"-- training and educational programmes for personnel involved in activities that could influence drinking water safety ..."

A. Yes.

Q. You put the control of the materials as a supporting programme rather than a control measure. Is there any reason for that?

A. Well, it's one of these things that can fall into either category.

Q. But you chose support programme in two places in your report?

A. It can go in two places, but it's not actually part of the supply process.

Q. Okay.

A. So it's slightly to one side, and although in many respects it's a control measure, there is a programme involved with it. So it's not just a straightforward, "We've put a treatment step in here and we chlorinate." It's not like that. You have a whole series of steps and you have a programme that's involved in actually approving the materials, listing the approved materials, and so on. The control measure is making sure that the appropriate chemicals and materials are used.

Q. Yes. Sorry, I interrupted you there.

A. Yes, yes.

Q. But let me see if I understand you correctly, or try and see if this really is the philosophy.

Of course, if we talk about training and educational

programmes, these are support programmes -- I mean, by the very nature, training, for example if you strengthen the training of the plumbers, this is an important aspect of the support programme?

A. Yes.

Q. You make them knowledgeable about the importance of the correct use of materials, that's an important part, but it is a support programme?

A. Yes.

Q. Whether or not you elevate certain things to a control measure -- say, for example, if in the first stage, your high-level -- sorry, I keep using the word "high-level" -- your multidisciplinary committee identifies a risk, and this is a material risk, there is a hazard in it, then you may want to say, "Certain parts of the monitoring programme should be a control measure", but otherwise, for example, like the normal daily ensuring of correct materials are used may well be a support programme. So you have to identify the risk first.

A. Right. You said "monitoring" -- what do you mean by

"monitoring"? Because "monitoring", it can fall into -- we use "monitoring" very loosely, and the definition of "monitoring" really relates to what you are trying to achieve. So there can be investigative monitoring, but I'm suggesting some investigative monitoring for metals in here, where they will be examined, we will look to see whether they are present, and so on. So we gain information from there.

Q. Yes.

A. There's operational monitoring, such as we've talked about making sure the gate is shut and so on. Then there can be verification monitoring.

Now, are you talking about verification --

Q. I'm talking about perhaps the process.

A. Right.

Q. You start with, say for example, material monitoring.

A. Right.

Q. You have introduced different parameters -- you have suggested additional parameters --

A. Yes.

Q. -- as means of the monitoring, then operational and

verification.

A. Yes.

Q. But even the first layer, first item of monitoring, that of course is dependent on the risk assessment in the first place?

A. Yes, and clearly a risk assessment had taken place, because Hong Kong has recognised that lead was a problem, and lead solder and high lead copper alloy fittings are not permitted for use. So you have that in place. So there's a risk assessment, and the risk assessment says that this is likely to be a problem.

You then have taken steps -- you have a control measure in place. That control measure is that you don't use these.

The Housing Department have that control measure stated in their contracts.

Q. Yes. That's right.

A. Where the problem has come has been the operational monitoring that that's actually working. I understand that can be quite complicated, but that's where it's broken down.

Q. This is where it comes back to, I think, one of your answers yesterday. You were impressed about the fact that Hong Kong has been able to put up all of these high-rise buildings.

A. Yes.

Q. I think you mentioned it a couple of times.

A. Yes.

Q. I think you did say at one stage that it takes your breath away or something like that, to that effect.

A. Yes. It is very impressive, having visited the buildings.

Q. Also I think one or two places you say this is a very unique situation, in Hong Kong. Certainly the buildings, the putting up of these buildings, is a complicated procedure. You have lots of procedures, lots of different aspects of the construction work to look after, and so on and so forth.

Now, I don't want to rehearse everything that you said yesterday, but in essence you did say at one point, though, that perhaps people have taken their eyes off the ball?

A. Yes.

Q. That's an expression you used yesterday.

A. Yes. That's exactly the expression I used yesterday.

Q. That is where the risk assessment and then the highlighting of this -- the reiteration of this risk comes in.

A. Not quite. I understand what you are saying, but that's not quite correct, because nothing had changed, basically. Nothing had changed. So the iterative process is something has changed and therefore you go back to the beginning. Nothing had changed. Lead was still a problem, if you put it in.

Q. Yes.

A. What the failure was was at the point of the operational monitoring. So one has to say, "Okay, if we are going to fix this -- we are not actually going all the way to the beginning; we need to make sure that our operational monitoring is both practical and effective."

Q. Right, but also that of course requires somebody with his eye on the water quality rather than on the construction aspect of the project?

A. Yes, yes, absolutely.

CHAIRMAN: Well, it's not mutually exclusive.

A. No, no, it's not.

MR HO: But I think what you say -- you do say that of course people putting up these high-rise buildings --

you know, their concern or their main concern was that these buildings don't fall down. You say that, in a way --

A. I did. We had a conversation about that when I visited the buildings.

Q. In conjunction with your comment that people might then have taken their eyes off the ball, then would you say, "In that case, these are people who are primarily concerned with functionality of a construction process, but there must be somebody who should look after another aspect, like water quality"?

A. Absolutely. There needs to be somebody who is aware of water quality.

Q. Yes.

A. The way that it's been set up, it would appear that that

should fall to the licensed plumber.

Q. Yes.

A. That's the logical person.

Q. I'm coming to that, in fact. But this is the present set-up. Now, of course we can talk about how to improve on the present set-up --

A. Yes.

Q. -- but this is the set-up before the incident has come to light, and probably now is in the process -- part of the terms of this Commission is to see how to improve on the system.

But the present set-up is that, yes, there are lots of people engaged in the construction of these very impressive units. You have a developer, you have architects, you have building services engineers, you have main contractors, you have licensed plumbers. Now, I haven't mentioned WSD. But certainly, if somebody were to raise the awareness of this construction industry to not just look at the functionality of your building process but also pay some attention to water quality and an assurance there, WSD must have a role?

A. They certainly do. They should be the experts on water quality and they should be treated as the experts on water quality.

Q. In this, I say the process of construction, WSD cannot say, "I don't have a role there"?

A. No, they can't say that it's nothing to do with them, because they understand about water quality.

Q. They are the person who should be looking at water quality?

A. They have expertise, and they can advise.

Q. Yes.

A. So they have an advisory role. And the system in Hong Kong is a little vague when it comes to this area, between the two sides.

Q. I will take you to that in a moment. Yes. But you do agree that certainly they have a role?

A. Yes.

Q. In raising the alarm, because they are the ones who look at water quality?

A. That's a difficult one, because as written down at the moment, they are responsible for water quality up to the

point that the water goes into the building. Their expertise is such that they ought to be able to advise that there may be issues within buildings.

Q. Yes.

A. And to speak to the HD about that.

Q. Yes.

A. Now, their position might well be that there is a process in place, in terms of approved materials.

Q. I am grateful for your last answer, because you say that they have the expertise to advise.

A. Yes.

Q. Now, whether or not they did and whether or not the present water safety plans do take care of that, that's a matter I will come to in a moment.

A. Okay.

Q. But I think your premise is that whether or not they are actually doing it, they do have the expertise to do it, if they wanted to?

A. That is likely, in Hong Kong at the moment, to be the source of expertise.

Q. Yes.

A. Because they deal with water quality.

Q. Indeed. They are the person -- in this development project, where most people would be more concerned with functionality, they are the ones to actually raise an alarm bell. If there is an alarm bell somewhere about water quality, that's where they should come in?

A. Yes. They should be consulted about that. Then the question is how does that consultation take place.

Q. Yes. Then we come back to the water safety plans and so on, and that philosophy.

A. Yes.

Q. May I now take you to the water safety plans that we actually had before the incident, and now, it seems, after the incident has come to light.

A. Right. Where are we?

Q. Before that -- perhaps, sorry, I want to take you to one matter first, before I come to water safety plans. May I ask you to go to your paragraph 63, because this is one part that I may have to ask you to elaborate.

Paragraph 63 -- first, you have been taken to their

meetings, the first working group meetings on the Development and Implementation of Water Safety Plans of 28 February 2005. Yesterday we looked at that.

A. (Nodded head).

Q. This is where they say -- somebody has mentioned that they do have indirect control of systems --

A. Yes.

Q. -- in private buildings, in private premises. I think your evidence yesterday is that due to the time constraints you could not actually ask further and probe further what that actually meant.

A. Yes.

Q. But in fact, this is 2005, this meeting, and in 2006 we do actually have the water safety plans from -- sorry, I don't say "we" because they are not published -- the Water Supplies Department did produce a water safety plan, and if I may ask you to look at their plan. This is C20.1, page 15582.

A. Which tab is that, please?

Q. 169-1.

A. Got it.

Q. It starts at page 15549.

A. Yes. I've got it. Thank you.

Q. You see, on this cover page, the edition, this one is 2006, in March. You see that?

A. Yes.

Q. I don't immediately jump to the conclusion that this has something to do with somebody has uttered that they do have direct control of the premises. But it seems that this somehow chronologically follows from that meeting; you see that?

A. Yes.

Q. At 2.2, at page 15555, you see the preambles?

A. I have it.

Q. At 2.2, they say:

"The WHO considers the application of a preventive WSP as an effective means to assure the quality of drinking water for the protection of public health.

A [water safety plan] systematically assesses risks throughout a drinking water supply system from the source through treatment to customers' taps and identify the control measures and operational monitoring that can

manage and minimise the risks to public health."

So, in that sentence, it does seem, at least from paper here, it encapsulates basically what -- first of all your source to tap approach?

A. Yes.

Q. Because it does talk about customers' taps here, and it does encapsulate the philosophy that we looked at in the WHO paper, the chapter 4 that you referred to just now?

A. Of the guidelines, yes.

Q. Risk assessment, systematic risk assessment; then control measures, operational monitoring, from treatment to customer taps?

A. Absolutely.

Q. So in fact WSD has set out in 2006 at least to try and do that?

A. The framework is there, and the question then is at what point do they need to bring in or make contact with other people. I have been in circumstances where other stakeholders just don't want to get involved.

Q. Right.

A. In which case you've got a problem.

Q. But here, the WSP is not a publicly -- sorry, these water safety plans have not been publicly available documents. These are internal documents for WSD, apparently, as a fact?

A. That's not entirely true. You can access it on the web, but you have to know what you are looking for.

Q. It is a fact in Hong Kong that even when we asked, we had difficulty trying to get hold of WSPs, until recently, of course. Now it's produced for the purpose of this Commission. But hitherto, it's not available to the public.

A. I have said in my report that I was concerned about -- it was not clear to me how much consultation there had been with other stakeholders. That wasn't clear from the information that was available. It wasn't clear from the discussions, because there wasn't time to take through all of these things.

Q. Yes.

A. Therefore, there is a clear gap at this point.

Q. Yes. The point here that I try to make, and see if you agree, is that in that paragraph, it seems that back in

2006, the WSD did recognise the advantage of this approach and incorporated here as a preamble?

A. Clearly they recognised the importance of the approach, but, like many other organisations, when it comes down towards the tap bit, it becomes less certain.

Q. Yes.

A. That's very common. In fact it's usual, and the WHO recognised that this is a difficult area. It would have been helpful, I think, if there had been other external stakeholders, including the HD, involved. Equally, there are issues where other stakeholders need to make an effort to make contact with perhaps WSD or whatever other equivalent there might be, in order to say, "We have concerns in this area, you have expertise; we are seeking your expertise."

Q. Yes. Well, this in fact -- I don't know whether you are aware of this -- when the idea of introducing copper pipes to the public housing estates back in 2002, there was a consultation with the WSD and they were asked for their comment, to ask them to see if the introduction of

copper pipes would pose any problem. You are aware of that?

A. Yes. I've not seen it in detail. I've not looked at it in detail.

Q. All right.

At 5.1.2, again you see a multi-barrier approach being stated here, an integrated system of procedures and processes that collectively prevent or reduce the contamination of drinking water from source to tap.

Again, it's the idea of putting in barriers to ensure or to reduce --

A. Yes. I have to say that in discussions, the term "source to tap" was used fairly loosely.

Q. Do you mean they --

A. It was really source down to the point at which water was supplied to buildings, in much of their thinking.

Q. Well, in much of their thinking, that's one thing, but what they have written down is another. What they have written down there does in fact suggest that at the time, they were thinking more -- they were thinking of the source to tap, not just source to connection point.

A. I hesitate to disagree, but I think you are using a lawyer's view of the way that these words are used. The term "source to tap" is very loosely applied and is a phrase which is used pretty well to talk about water safety plans, and many, many --

Q. You mean they did not mean to extend -- sorry.

CHAIRMAN: Prof Fawell, you are very, put it this way, generous to the WSD. Let me provide you with this piece of information. When the director of the WSD came and testified in this hearing, we then came to know that in 2015, he actually amended --

MR HO: I was going to come to that.

CHAIRMAN: He actually amended the pledge from saying "source to consumer tap", and he actually asked his subordinates whether that could actually be achieved, and then as a result the wording had been changed to "source to consumer" rather than "to consumer tap".

MR HO: Yes. Professor --

A. I can understand why that was done, because of the complexity. My criticism of the approach is that there was insufficient recognition of the need to work

together. That is where I have criticism.

CHAIRMAN: Yes.

MR HO: I understand that. I understand your point.

A. And that's on both sides.

Q. But the reason, despite all the shortcomings of lawyers -- I'm not being pedantic in this case or trying to highlight a term that probably the WSD didn't mean what they said. "Tap" does mean tap, when they actually use this in the document.

Because if I may then ask you to go to annex 4, which is at page 15582 -- now, the WSD, within their department, they have got a Customer Services Branch, and in the document they have the specific annex to provide for the roles and responsibility of this particular department within the WSD.

Now, you see in paragraph 1.1, their mandate, this branch's mandate, is responsibility "for undertaking measures and practices to ensure the quality and the safety of drinking water supply to customers", and these are important words, "beyond the connection points."

A. Yes.

Q. So it's beyond doubt, when they were drafting this document, at least the people who endorsed this document were actually thinking about water quality to the taps, beyond just connection points?

A. Yes. I have to say, when I did visit, I did not have any contact with the Customer Services Branch. One might say that they were conspicuous by their absence.

Q. That's not what I was intending!

Yes, thank you.

A. I had expected that side to be available. I understand the difficulties for the WSD, because it was a very short time, at fairly short notice as well.

Q. It would seem at least the drafter at the time, defining roles and responsibilities of the Customer Services Branch, has a rather broad view of water quality in Hong Kong?

A. Yes.

Q. A comprehensive view?

A. Yes.

Q. So, in some way, would you agree with me, that seemed to

echo with whoever uttered that sentence or the view in

their first meeting, saying, "We do have an indirect control over the quality in private premises"?

A. I would have expected a rather more detailed involvement in the development of the water safety plan. One of the things which is also apparent is that there is quite significant compartmentalisation within the WSD, and I've read a number of documents where Customer Services Branch are sort of a separate organisation. And that is not unusual, actually, to be fair, in many places, because they operate in a different way. It takes time to overcome a philosophy of separation and change that philosophy of separation to a philosophy of inclusion and co-operation.

Q. I understand. May I -- just bear with me and let me complete this page, if I may.

We know their scope of duties and responsibility include (a) -- (a) talks about "prescribing the nature, size and quality of pipes and fittings", so they actually had their eyes on this. It then talks in terms of circular letters or waterworks safety requirements, and so on, and cites the enabling provision in the

Ordinance to support what they could have done, or might have done, if they had wanted to?

A. Well, I would argue that largely they seem to have -- up to that point, they fulfilled their responsibilities in that they had materials that were supposed to be used. They agreed that approved materials would be used. Then it all starts to get a bit vague.

Q. (c) talks in terms of licensed plumbers.

A. Yes.

Q. (d), inspection. So despite all the complications about private premises, this document was drafted with a view, at least at the time, that they recognised the importance of inspection of these inside services, upon the completion of the construction and installation of the plumbing and fittings?

A. Yes.

Q. And that of course, you also accept or recognise, is an important step?

A. Absolutely, and my understanding that in that inspection they do identify things like I raised yesterday, dead

ends and teed off connections, and so on.

Q. Of course counsel for the Commission yesterday has also pointed out to you that in inspection, solder is not one of those things being inspected?

A. No, because under those circumstances, the methodology that was available for inspecting a solder was simply not available to them.

Q. Right, but this may be an explanation for -- I don't necessarily use the word "excuse", but I just say, neutrally, an explanation for the construction industry, when they look at the construction of the building.

But for somebody who would be concerned with quality of the drinking water, this inspection would have taken a different dimension, would it not?

A. I would say that the problem has been that there has not been an appropriate -- if there had been an appropriate set of standards, and appropriate regulations, then that would have been taken a step further in terms of water quality sampling, which would have provided a verification in new buildings that lead had not been used. Now, we can talk about sampling techniques and

all the rest of it. That's irrelevant at this stage.

Q. Yes.

A. Actually checking for the use of inappropriate materials I think would have then have taken place. I am concerned, and I would emphasise again, I am concerned at the lack of standards, because those standards -- the guidelines, as such, it's too soft and too easy to get away from, and I think with a set of standards, both sides then will understand the importance of what they have to do.

Q. Of course, I take this as a suggested measure going forward, but allow me to take you back to the situation before the incident, where internally, in WSD, they have this mandate for themselves.

What I am highlighting to you in paragraph (d) here is that for WSD, that inspection, if they had done it, would have been not so much about the construction functionality, but more to do with ensuring quality of water, if they had done that inspection, if they had put in the correct parameters to address where risk might have been?

A. Possibly.

Q. Sorry, is that too long?

A. Possibly. I think that you are -- you cannot shift or grey the responsibility for making sure that the terms of the contract are met, to another department.

Q. No, no, no. You have completely misread my question. I am not asking you at this stage about who else should have been involved in the water safety plans and so on.

A. I would have -- if I --

Q. I am just focusing at the moment --

A. If I had designed it and had been involved, I would have wanted some sort of verification that the terms of the contracts were being met. In the end, it is such a complex process that the most -- the two most useful ways of verification, one is actually using the X-ray fluorescent spectormetry to look at joints and the other is actually taking water samples and looking for lead, the appropriate water samples.

The difficulty with both of those is that we are seeing signs that within buildings, the lack of meeting the requirements is not consistent in different parts

of

a building. So one is faced with very difficult-to-detect problems.

Q. That's right.

A. You can take random samples but it doesn't say that your random sample is going to pick up the fact that you've got a problem.

Q. That's exactly what I want to explore with you, Professor.

Now, we know after the incident the WSD has introduced four additional parameters for heavy metals.

A. Yes.

Q. I don't see that you are disagreeing that that is perhaps an approach with merit.

A. Yes, it does have merit. It has merit because it is attempting to investigate and ensure that there are no other problems within plumbing.

Q. That's right.

A. And that is prudent.

Q. Yes, prudent. But then the question is, first, why was this not done before the incident came to surface; or, if it wasn't done, should it have been done before 2015;

if it should have been done before 2015, should it have been done in the same way as it is now done, that WSD has now put in a circular and is advising all those stakeholders that, "These are the parameters we are going to test"?

A. It is very easy to use 20/20 hindsight --

Q. Absolutely.

A. -- and say that this should have happened.

In discussion between both HD and WSD, it was clear that they believed that the procedures that they had put in place to prevent the use of lead were working efficiently, therefore suggesting that there would be additional and quite complicated steps at that time, without having the knowledge of what's happened since, I think would have been showing a level of foresight that might be regarded as quite spectacularly good.

Q. Sorry, you say, if one were to require, I say WSD first, to actually have that degree of foresight, in fact you say it's spectacular?

A. Barriers have been put in place to prevent the use of lead, and to suggest that WSD should have recognised the

fact that there was a good chance that Housing Department would not enforce the conditions or were not able to enforce the conditions of the contract is asking a lot, I would say.

Since it has happened, clearly there are circumstances that both departments have been -- feel that they have been caught out and let down. There were other parties who clearly did not fulfil their part in the process. So I think at that time it would have been unreasonable to expect that they would have then gone and checked. It would have been, to an extent, saying that another department is incompetent and therefore we are going to double-check on them, and that's not easy to do.

Q. Indeed. This brings me to the plumber point. Now, you know in Hong Kong the legislative framework or the design is such that absolutely nobody would be allowed to construct, install plumbing works, inside service -- I'm simplifying, but that essentially is the design of the legislative framework -- other than a plumber or somebody authorised by the WSD.

A. Yes.

Q. So the legislative design puts the sole responsibility on the plumber, because all that follows about use of correct materials, compliance with British Standards, ensuring that the plumbing work is done compliant with drawings, say for example, falls on the plumber, on the regulatory framework?

A. Yes.

Q. Of course, you just say hindsight is a very powerful thing, but if we have that legislative framework, with the plumber being the only person who's authorised to do plumbing work, the licensed plumber, would you also say that -- well, if you were to say, without that hindsight, it would be a marvellous thing if the WSD had the foresight of going one step further and looking at the quality of drinking water, would you not say the same thing and give your equally generous remark, charitable remark, to the HD and also to the main contractors and the subcontractors?

A. Where I have real difficulty in all this, and where

I would be critical, is that according to the information I have on the training that is given to the licensed plumbers, there is quite clear information about the potential health hazards of lead in water and lead soldering and that is why lead solder is not approved, and so on. Even if it doesn't say, "Lead in water is a hazard and therefore we have banned lead solder", if the level of intelligence of the people applying for licensed plumber is so low that they can't make that connection fairly easily, then I think there is a problem in the process, in the examination process.

Q. Yes.

A. I think that where there is a difficulty in the licensing process is that it appears to be a one-step. So you license a plumber and he's licensed, and there is no subsequent re-examination or reaffirmation of the importance of the role.

And I think that is an area that is difficult, but I think that's the responsibility of the WSD.

Q. That I would also try and explore a little bit further

with you later. But I'm just trying to bring you back to your earlier comment that, you know, given all this set-up, the contractual set-up, and so on -- you say, with the benefit of hindsight -- of course, you can say a lot of things could have been done. I'm just asking you whether, with that legislative framework and the scheme that we have, you might also extend your rather charitable remarks to the WSD, to other stakeholders as well, and say, "Yes, we have a contract, you need to enforce your contract", but you also have to recognise the fact is that plumbing work is specifically assigned to the licensed plumber and they are supposed to have the specialty in performing, carrying out the work, ensuring the compliance of the materials under the legislation?

A. Where I would be charitable is that as far as I can -- of the documents I have read, as far as I can see, the roles of the licensed plumber are not as well laid out as they ought to be. So the clarity of the various parts of the role of the licensed plumber is not as clear as it should be. Yesterday we heard about

a situation where licensed plumbers just signed off documents.

Q. Yes.

A. That should not happen.

Q. That is the implementation. Of course, we can talk about strengthening what is actually happening. "It's undesirable; we need to strengthen it." But I am talking about more the structural and legislative framework, in asking you that question.

You may say, "Well, the licensed plumbers are not doing their job, and therefore we need to strengthen their training, we need to perhaps see how we can deal with it", but in the legislative framework that we have, and the legislative design that we have, they are supposed to be the specialists and not even architects can deal with --

A. I understand that.

Q. -- the plumber. Not even the electrician can deal with the plumbing work. Not even the BSE can deal with the plumbing work. They can have a higher level of perhaps checking --

A. As I have indicated -- I have indicated this in the

report, that I do feel there's been a failure on the part of the licensed plumbers to fulfil their proper function, as people who have been trained to cover this area.

Q. That's right. I think also in your report you say that is very important, because especially things like the solder, once it's taken out then it's very difficult to distinguish --

A. You can see but it's --

Q. It's very difficult to distinguish lead and no lead. So their training is all the more important?

A. It is, and the training that's provided to the technical plumbers, the trade-trained plumbers, is also important in that respect.

Q. Yes. Also, they are the ones who are supposed not only to look at the functionality of the work, whether or not it leaks, and so on, the pipe leaks after it's been joined, but also you say they also should look at the water quality, from that angle; they should pay more attention to water quality?

Or, sorry, maybe I should rephrase it. To be more

alert to the effect of the use of wrong materials on water quality?

A. Yes, that's a better way of putting it.

Q. Right. Yes.

A. They should be more alert to the requirements in terms of materials, because that is a significant role. And yesterday I suggested that I personally, if I was in control of the system in Hong Kong, would like to see the licensed plumber position given greater status and therefore greater authority.

Q. Allow me to ask you later on on that, because I do think that that is an area that I would like to discuss with you, especially I would then try to tap your experience on the UK experience.

But allow me to come back to this question first. Given that they are at least in the scheme, legislative, regulatory or whatever, the scheme of things, they are the ones who are most -- or are supposed to pay a great deal of attention also to water quality and ensure the use of materials, correct materials, to that; right?

A. Yes.

Q. Then of course, depending on what this Commission is going to find, at the end of the day, as a matter of fact, how the wrong use of material came about. I am not trying to preempt or prejudge here, but assume at the end of the day the Commissioners were to find that it is a wrong use of the materials or a misuse of the materials that contributed to the lead into the system -- right?

A. Yes.

Q. Then you are asking the other stakeholders, who are more remote from the immediate cause of this, to say, "Should I, before the incident, have a foresight into this?"

A. I think you are rather undermining your position, because the argument is that they did have foresight because they actually put it in the contract.

Q. Yes.

A. And it was specified separately. There are not so many things that are specified so separately.

CHAIRMAN: So the control measure was put in place; it's the monitoring of the control measure that fails?

A. Absolutely. Yes, chairman.

MR HO: Monitoring, of course, we have been through all this before, is whether you have your eyes on the ball. If you have your eyes on the ball, you put in more monitoring; you pay more attention to it?

A. Yes, you don't make assumptions, and clearly there were assumptions made at a whole series of levels that something at the lower level was happening, and nobody bothered to ask, "Is it really happening?"

Q. Right. May I ask you to look at one statement. The reason why I want to explore that with you is to see whether I understand you correctly, your statement at paragraph 63. In the middle of that paragraph you say:

"This is important since WSD do not take responsibility for water quality beyond the supply point ..."

Do you see that sentence?

A. I do.

Q. In fact I think you also say more or less the same thing -- if I may ask you to go to page 116.

A. Yes.

Q. The fifth line from the top:

"It would appear that no one had specific responsibility regarding water quality at the tap."

Paragraph 78, in the middle of that paragraph:

"It is also clear that because WSD did not take any responsibility for water at the tap and had not formally delegated that authority, no one took that responsibility."

You see, there you say, in different words, but you say WSD had no responsibility for water quality at the tap. Are you saying they themselves considered not having a responsibility or are you saying as a fact they did not have a responsibility or are you saying --

A. My understanding was that it was agreed that within Hong Kong and within the various departments, WSD would not have responsibility within buildings to the tap.

That is actually not dissimilar to many other countries. How that then operates will vary. It's only within the last 12 months that in England and Wales, water suppliers have had to take a much greater responsibility within buildings.

Q. Yes.

A. So, as far as I'm concerned, in terms of formal responsibility, that is the case.

Q. You say "formal responsibility"?

A. Yes.

Q. Despite what we have looked at, for example, like the Customer Services Branch mandate?

A. Yes, because the Customer Services Branch responsibilities are about materials, equipment, making sure the process is in place in order for those materials to be used properly.

Taking responsibility for water quality at the tap it a little bit -- you are being a little bit disingenuous.

Q. Me?

CHAIRMAN: Of course you!

MR HO: May I ask you to rephrase that, please?

A. You have a position that you are trying to achieve and I think --

Q. No. I just want a balanced view from the expert.

A. I think the position is that it was agreed amongst

a number of different departments that although they would cover things like -- they would provide the expertise to cover things like lists of materials and so on, that they did not have the formal responsibility at the tap, they did not take samples at the tap, that this would not be part of their remit.

I happen to think that that is not sensible. What I think is sensible, under those circumstances, is slightly irrelevant. Do I think it should change? Yes.

But what they didn't do, and because there was no regulatory structure, nobody actually decided who was going to have that responsibility.

Q. Yes. That I think is probably the correct analysis, in the sense that despite what they say about what they intend to do in the water safety plans, but then in the legislative framework there is not a specific mandate, to mandate them to look at the water quality at the tap -- I think to that extent I would agree with you. But they have, in fact, I think, as a responsible department, actually produced a water safety plan, general water safety plan, back in 2006, which says they

aspire to do a little bit more and then look at also ensuring water quality at the tap.

A. I would agree with that, and do I think there was fault at not incorporating a broader range --

Q. Right.

A. -- of stakeholders? Yes.

Q. That was where, having set out to do one thing, and if that is taken as implemented, they should then engage other stakeholders, and if they had done, then probably this issue would have been better addressed or would not even have arisen.

A. One would have hoped that it would have been better addressed.

Q. I see.

A. By all the appropriate stakeholders.

Q. That's why I believe also you, in your report, have in several places said "engage stakeholders".

A. Yes.

Q. I think it's paragraphs 56 and 59 of your report.

A. And the wording here was chosen very carefully.

Q. "Engaged", yes. I believe you say "WSD to engage other

stakeholders".

A. Yes. They're the lead. They would engage. "Engage" means not just tell them that it's happening, but actually have proper, meaningful discussions.

Q. Absolutely. Okay. Mr Yin, on my left, says you actually use the words "external stakeholders".

A. External to WSD.

Q. External to WSD. They engage external stakeholders.

CHAIRMAN: Let's take the morning coffee break for 20 minutes. Thank you.

上午11時18分聆訊押後

上午11時40分恢復聆訊

MR HO: Professor, this morning the chairman has actually mentioned the 2015 version of the water safety plans put out by the --

A. Yes.

Q. Sorry, now prepared by the Water Supplies Department. I just want you ask you to have a look at that. If you would kindly turn up B15.4 at tab -- B13.4 at tab 402, page 40343.

We have done a little bit of homework and tried to

compare the three different versions of the water safety plans. You take it from me that's a diligent piece of work and what is there is actually accurate.

A. Ah, right. Yes, I've got it.

Q. As you see from the left-hand side of that page, that's the 2006 version, which I have taken you to earlier in my discussion with you. In the middle, we have a 2011 version, and on the right-hand side we have the 2015 version. Do you see that?

A. Yes.

Q. We have highlighted the changes through these three different versions. There are one or two parts that I want you to comment on. For example, like paragraph 2.2, which I have directed your attention to this morning --

A. Yes.

Q. -- in the 2006 version. You see the highlighted part refers to "source through treatment to consumers' taps"?

A. And then through to consumers, yes.

Q. And the 2015 version cuts out the "tap" and simply says "to customers".

A. Yes.

Q. This is I think the chairman's comment this morning.

Incidentally, also go to paragraph 5.1.2.

A. Yes.

Q. You see originally it was stated to be "drinking water from source to tap" -- that's your "source to tap" concept; right? And on the right-hand side you see the latest version is "from source to distribution"?

A. Yes, I see that.

Q. Do you have any comment about this -- reading literally, it seems to be a retracting of their responsibility for the water quality?

A. I think on 2.2, "treatment to customers", that could be construed as being more accurate in terms of the way that things are constructed in Hong Kong.

On 5.1.2, that arguably shouldn't be correct at all. "Source to distribution" implies that it's only just the treatment works, or sourced then to the end of the treatment works, whereas clearly it should be a lot further, and even if it is to the point at which water is delivered to consumers, then that should be clear.

So that, actually, as it stands, would not be acceptable.

Q. What I want to ask you is that if there were these water safety plans, if -- I have taken note of the document that I discussed with you this morning, about the concept of water safety plans, ensuring quality from source to tap -- would you have said that 2006, in fact, as far as water safety plans are concerned, they probably have got it right; but 2015, in fact, is a regression?

I don't mean to underestimate the difficulty or the practicality --

A. It's very difficult --

Q. -- but it is a regression, isn't it?

A. You are asking me to give an opinion of somebody's thinking, when I was not present when that thinking was taking place, so it's very, very difficult. I wouldn't necessarily regard 2.2 as a regression, because that's quite frequently what I see in many water safety plans.

Q. Yes, but would you -- leaving aside what is actually stated in the document -- have said, "What if one now

stands in the shoes of the WSD today", say today -- of course, assuming the chairman may recommend that we should look at water safety plans more vigorously, "It would be a good idea, the way forward, for WSD to engage other stakeholders to develop water safety plans"? Assuming that's the position, that's the standard, would you have said, then, in that case the 2006 version should be a better model than 2015?

Leaving aside the wordings here?

A. No, I think you are missing or you are trying to put too much emphasis on one word --

Q. Ah.

A. -- when that is not the way that most people think now.

You have given me some information about changes and how those changes were made. I have not seen any evidence whatsoever as to whether that is the case or not. I only have your word for that. So I cannot put myself in the position of the director and what the director is saying.

Q. Sorry.

A. I would say that --

Q. I apologise to you, because we've heard the director and

he's given evidence on that.

But leave that aside, for example. Leave that aside. I'm not trying to just focus on one word. As a matter of concept -- that's probably more important --

A. Well --

Q. -- your "source to tap" concept, would you say, as of today, if we were to look into development of water safety plans, should WSD approach that question by looking into really the concept of "source to tap", or should they simply say "source to connection point", and then, "Because your connection point is far too difficult, far too complicated, we will leave that out for the time being"?

A. What they have said is "source to consumer" or "customer". That is not unreasonable, and that is the way that many water safety plans are actually phrased. However, within that, the lead authority, and WHO emphasise this, should be the water supplier. The water supplier as the lead authority then has responsibility to engage with other stakeholders, to ensure that the

whole of the train is covered.

Q. Yes, precisely that, is because the whole point of engaging other stakeholders is to ensure that beyond the connection point these other stakeholders would also be aware of their own responsibility, how they can contribute to safeguard the water safety?

A. Absolutely. I don't think it matters in the detail here, because it still is not clear to me exactly what the legislative responsibilities -- where they lie. I'm not sure anybody is totally sure.

Q. But it's not just about the words -- allow me --

A. But the engagement part and engaging with other stakeholders -- and that's why I actually commented about -- I was uncertain about the extent to which other external, ie people outside the WSD, stakeholders, had been engaged and been involved in the process.

Q. It's not -- don't get me wrong. I'm not sort of trying to play around with words, just pick up one word and so on. It's the concept and thinking behind it that I really want your expertise and your expert opinion on.

The whole concept should now -- the incident has

surfaced, we know this matter, which affects public housing and I don't know to what extent it also affects other private developments -- but leaving that to one side, the idea, if this Commission were to pick up the idea, adopt the idea of water safety plans, as a concept, you have in your report, in paragraph 35, said WHO back in 2004, whatever, maybe that paper is 2008 but it doesn't really matter -- we are several years after that now --

A. Yes, it evolved through, but now we're in --

Q. It evolved, but the concept of water safety plans under the lead authority is to ensure water safety from source to tap.

I'm just asking you --

A. Yes.

Q. -- this ideal -- I know you may not be very conversant with all the nice ownership matters, about how pipes belong to whom and once it goes into private premises --

but leaving that to one side, as a concept, the WSD, as a concept now, if they were to develop water safety

plans, need only stop at connection point, then of course that is a very fundamental departure from what you said in your paragraph 35?

A. You are getting into the practicalities.

Q. I am, yes.

A. When we are talking about water safety plans, it has to fit -- when we come to that part, it's very straightforward, certainly between the treatment works and the point at which it goes into a building, because that's clearly under the control of the water supplier. At that point, there should be a plan. The plan may take a different form --

Q. Yes.

A. -- when it starts to go into buildings, but there needs to be a plan. The water supplier needs to be a party to that plan, and also other stakeholders that are involved.

So, yes, it needs to, but who finally takes the lead on that stage of the water safety plan will depend on the structure that you decide in terms of responsibilities, et cetera.

It need not necessarily be the water supplier. The water supplier would have an important part to play, but they may not lead in terms of the water safety plan in buildings.

Q. Can I just pause you there -- we are possibly talking at cross-purposes.

A. Possibly.

Q. What I am exploring with you is, say -- of course I'm not speaking for the Commission -- the Commission will have to make recommendations at the end of the day. I'm just saying if the Commission were to say it's a good idea to ask the WSD to take the lead, develop water safety plans, or at least look into possibilities of developing water safety plans by engaging stakeholders; right --

A. (Nodded head).

Q. -- along the signs that we looked at, the model, the philosophy that we looked at in the paper -- now, would you say, in that case, these water safety plans ought only to look up to the connection point; or when you say

"engaging stakeholders", obviously we are thinking about engaging stakeholders beyond the connection point, and that may be the way forward for Hong Kong?

A. Absolutely.

Q. I'm just asking whether --

A. I would have no problem with that. There should be a water safety plan that goes to the tap.

The situation is that in recommendations that I have made in the UK and elsewhere, recognising the complexities of dealing with plans in buildings because of the different responsibilities, and so on, and there are sensitivities as well -- what we have done is we have referred to a customer liaison plan.

Q. Yes.

A. In other words, it's a system -- it's a water safety plan but it has less of the precision about it than the plan has up to the point of the curtilage, because you can't have the same level, unless you've got a very intrusive regime, that says, "This authority can go into your house and do it", and that's going to be not possible.

Q. Yes.

A. But there needs to be something in place that provides management plans for buildings, management advice for buildings. That's particularly important in Hong Kong because of the nature of the multi-occupancy buildings.

Q. Yes.

A. Under those circumstances, the WSD are an expert group in certain respects. They may not be quite so expert in the details of what goes on in a building. Therefore, it becomes a joint effort between a number of stakeholders, and a decision has to be taken as to which of those stakeholders, under those circumstances, is going to lead.

So yes, they should be involved, yes, it should go to the tap, but yes, there should be a lot of --

Q. I hear you. It should go to the tap. I think that's probably the answer that I'm trying to get to.

This is basically consistent with what you said yesterday --

A. Yes.

Q. -- that they are the expert, they provide advice, and then other stakeholders will then have a responsibility

of implementation?

A. That's correct.

Q. Of course, that encompasses all that we have seen in the paper, the flowchart --

A. Yes.

Q. -- the risk assessment, identification, control and all that, and then further down is the support measures, programmes?

A. Absolutely, and it recognises that when you reach that stage, it becomes often less precise, because there are so many different individual stakeholders and requirement for individual --

Q. Of course. Yes, as a concept -- I am grateful for your confirmation that as a concept now we are looking at source to tap.

A. Yes.

Q. Unfortunately, we have heard the director, and perhaps you have not been apprised of this piece of information -- that somehow he sees the need for the revision in 2015 -- it's because he does not seem to think that concept of source to tap is something that

ought to go into the water safety plans. He retracted.

A. He may well have decided --

Q. I am not asking you to criticise anybody, but as an expert --

A. No, I'm not. There could be a whole range of reasons for that. As an expert, I think it should go to the tap, and if the Water Supplies Department are the lead organisation, they need to engage, as I have said several times, the appropriate stakeholders, to make sure that there will not be a deterioration beyond the point that they have control.

They may not be able to guarantee it, but involving other people and informing them and making sure that they understand --

Q. Exactly that, yes.

A. -- where the responsibilities end and where other people's responsibilities take over is important.

Q. Heightened awareness and vigilance; would you say that?

A. Yes. I don't think that any organisation can say, "We are just going to stop here and not have any" --

Q. Yes. The ultimate goal must be to prevent people taking

their eyes off the ball?

A. Correct. That's why I think we should have a regulatory --

Q. Sorry?

A. That's why I think a regulatory structure would be very beneficial.

Q. Yes. Now, on the regulatory side -- I do want to explore with you the licensed plumber. I take it you are familiar with our legislation?

A. To an extent.

Q. Basically, it's just broadly as I described to you this morning: only licensed plumbers are, under the law, allowed to deal, construct, install -- we are talking about inside service now, but basically plumbing works.

A. Yes.

Q. The legislation provides that they should use materials that comply with the British Standards, and the British Standards are set out; right?

A. (Nodded head).

Q. Nobody else would be allowed to do that, lest they run the risk of criminal prosecution?

A. (Nodded head).

Q. You understand?

A. Yes.

Q. So licensed plumber, on this legislative design, assumes, I would say, the unique responsibility of ensuring plumbing works comply with, for example, the British Standards and use of materials?

A. Yes. Well, from the list of approved materials -- there are difficulties there, because the way that the legislation is phrased, it actually could be interpreted that the licensed plumber is being asked to take a responsibility that they may not have the capability to take. But I take your point.

Q. You mean for supervision of their workers?

A. In other words -- no, in terms of finding out about which materials are actually approved. There should be an up-to-date list of approved materials in Hong Kong that allows the licensed plumbers to make sure that they can obtain the appropriate materials, that anybody else is obtaining the appropriate materials, that everybody else is obtaining the appropriate materials, whatever

the materials, and that they are being installed.

Q. Let me pause you there again. If we drift into approval of materials -- of course we do have the procedure, called the PLU1, but never mind about that for the time being. I am just coming back to the system first, about the licensed plumber. They are absolutely pivotal --

A. Yes, I --

Q. -- to ensuring correctness of materials?

A. I would agree. From all I have read, the licensed plumber is a very important position.

Q. Yes. They are the specialist?

A. They are the specialist. I have a caveat to that. The caveat is in the discussions that I have had with a number of people, the status of the licensed plumber in the eyes of other groups is not as high as it should be.

Q. Again, I'm not perhaps being presumptuous. I don't take over the making of recommendations. But leaving aside the shortcomings, say, of what actually -- what we see now, having heard so many days of evidence about the performance or the awareness of these licensed plumbers

of the situations or their responsibility, having heard so much about it -- leaving that aside for the time being, I'm just talking about if one looks at the system, it would seem at the moment the system does place a great deal of reliance on the licensed plumber --

A. It does.

Q. -- doing the job properly. That is one safeguard for ensuring that proper materials are used --

A. Yes.

Q. -- and hence indirectly not to contaminate your water; right?

A. Yes. It's a very important step.

Q. Yes, and there is at the moment -- I don't say whether this is effective or not effective -- but at the moment there is a regulatory system in place, overseeing the conduct of the licensed plumbers, because they have to be licensed, they run the risk of the licence being revoked?

A. Yes.

Q. They can be ticked off for not -- say, for example, not performing their duties properly, all sorts of things?

A. That's correct.

Q. Now, of course, then would the problem not be so much with the present set-up, with the framework, but more to

do with perhaps the personalities involved, whether the individual licensed plumbers do actually see -- are properly trained, have sufficient training, have heightened their awareness of the important work that they do; it's more to do with the implementation, as well as how effective are the enforcement measures over that regulatory system.

A. I would agree. The implementation is, to a great extent -- it revolves around the licensed plumber.

Q. Yes. If the licensed plumbers had performed their duties, had been diligent; right?

A. Yes.

Q. Then this is a good system to have, wouldn't you say?

A. I think it's an excellent system. I think there is a great deal to recommend it, a great deal to recommend it.

Q. I apologise to the chairman if I was somehow seen to be

disagreeing with him -- the way to address -- if this is a question of personality, a person not performing their duties, perhaps it is not a question of changing the system of licensed plumbers under the existing regime, to shift the responsibility to either the architect, the BS engineer or some other person to replace the licensed plumber, but the proper address would be to ensure that the licensed plumbers under the existing regime do perform their duties diligently?

A. Yes, and I have made some recommendations regarding making sure that the licensed plumbers have intermittent retraining, just perhaps one-day courses, et cetera, in order to highlight that.

The advantage -- I don't think you would be disagreeing with the chair. I don't disagree. I think that having a senior engineer in place is important. What we have is that, with plumbing, it gets rather forgotten, bits of it because there is -- and you need one person who's actually got responsibility and knowledge around that particular area. It's

a specialist area.

Q. Exactly that. Especially -- we are not talking about an individual piece of plumbing work in respect of a house in the countryside of England. We are talking about multi-storey building blocks which you find impressive in Hong Kong.

A. Yes. Absolutely.

Q. So the more that we look at the situation more, we go for specialty, specialisation, in respect of different areas of work. For example, like fire services, we see that there are dedicated -- I can't remember the term used for these subcontractors --

CHAIRMAN: Nominated.

MR HO: Nominated subcontractors -- they are dedicated, very experienced, to do fire services work. We have electricians who have to be licensed --

A. Yes.

Q. -- to do electrical work, and so on and so forth. The list continues.

Now, as far as plumbing is concerned, this is in a way, under the existing set-up, very much that, in

fact to ensure a specialist does the work, not just general practitioners --

A. Absolutely.

Q. -- be it an architect or a building services engineer?

A. Yes. I agree. I think it is very important.

Q. The point really is here to strengthen the training, awareness and the monitoring -- sorry, and the regulatory monitoring of that work, of their performance?

A. Yes, the regulatory oversight of the plumbers, yes.

Q. That's right. At the moment, we do have a regulatory framework for that. WSD has the ultimate power, disciplinary power, over licensed plumbers. As we see, the licensed plumbers involved in this case have been taken off and removed from the list?

A. Yes, absolutely. Yes.

Q. So again, it's not a difficulty with the framework, is it?

A. Well, I said in my report that I think the framework -- Hong Kong has a very good framework in place. It's making that framework work efficiently.

Q. Yes. So you engage other stakeholders, like for example the training -- VTC --

A. Yes.

Q. -- the Construction Industry Council or whatever; you engage other stakeholders to strengthen or implement better what is already a good framework?

A. Yes, absolutely. And this will start to move away from immediately water safety plans into a much broader area. But yes, it is very important that we have that level of training and understanding, and that there has to be a structure in place where the professional pride and integrity is an important part of the process of being a licensed plumber.

Q. Yes. Allow me to draw an analogy. Say, for example, like lawyers, solicitors, barristers. Of course, there are odd cases here and there we hear of that they fall short of the duties expected by their own professional bodies. But then, if self-regulatory is considered a good thing, for the Law Society to regulate solicitors, the Bar Council to regulate barristers, still, in relation to individual cases, we just have to

make sure there is a regulatory mechanism to ensure that if somebody doesn't act or perform up to standard, he is taken off the list?

A. Yes, that is correct, but it's more than that. There is a requirement to ensure that the licensed plumber is aware of responsibilities and aware of what is required at all stages.

Q. Yes. That may engage some suggestions of continuing -- education is probably the wrong word -- but continuing training, and so on?

A. Yes, and I think that --

Q. Where an occasion will be there to heighten the awareness of where things may go wrong, look at it from the perspective of water quality?

A. Absolutely, and I think it's important that such training involves groups of licensed plumbers, because, as in all professionals, working together as a group helps to reinforce the quality of the professional.

Q. Yes.

CHAIRMAN: I'm not saying that the present licensed plumbers

cannot perform their job. When I expressed my statement, my worry at the time is that because of the complexity of building structures in Hong Kong, if we continue to use the existing licensed plumber system, then it may go sort of beyond the ambit of, say, knowledge and experience of the existing licensed plumbers.

So that's why I mention --

A. I think it does -- I agree with you. I think it needs to be strengthened over what it is at the moment, because I think -- the role, it does not come across as being a professional role, and it should be a professional role.

MR HO: Then it's to pull them up to meeting that professional expectation of them?

A. And they should be treated in that way, because -- I agree with the chairman that you need to have an overall services engineer, but the licensed plumber is an important link, and therefore would be seen as very close in level.

Q. I would have reversed that order. In fact, they are the

pivotal person, rather than the building services engineer, who may have --

A. I am thinking of the overall project, because if you don't have the overall project, you don't have the plumbing. The plumbing is a relatively small but important part. But you need somebody who co-ordinates the whole of the project, because you can't just separate everything out. It doesn't -- I've been involved in some of these things and it doesn't work very well like that.

So, yes, but I think that the licensed plumber is pivotal for the installation of the plumbing and ensuring the quality of that installation, and should also have some training with regard to the design of plumbing systems, and should be consulted by architects, when they put together their plans. That's another part.

Q. I understand -- basically, your theory is that don't compartmentalise but engage another persons who may, to a degree, be more or less involved in the system?

A. I have long thought -- I have had some involvement with

the International Association of Plumbing -- and I have long felt that this is a group who are very, very important, and without -- we are not using, in many parts of the world, their expertise and their role to its full, and we should be doing that. Hong Kong has got the basis of a system. I think that system needs to be strengthened, and then I think Hong Kong will have effectively a world-leading system.

Q. Good. Thank you.

Now, may I tap on your experience of the UK legislation.

A. Right.

Q. I really would like your view on that.

If I understand correctly, I thought the legislation here is the 1999 Water Supply (Water Fittings) Regulations; I presume you are familiar with that?

A. Yes.

Q. Basically, if I understand correctly, this bit at the end of --

A. It's not the only bit. There are two bits. There's the Water Fittings Regulations and there's the DWI

Regulation, regulation 31.

Q. But let me just focus -- if it helps, I have some copies and maybe it's convenient just to distribute them.

I think the Benchmarking Study, we have also touched on this, and we can always make reference to that as well -- but what I am dishing out at the moment is really the regulations itself. (Handed).

In particular, I am looking at regulations 6 and 7 -- regulation 6.

A. Yes, I've got it.

Q. It would seem to us -- under regulation 6 -- now, the UK deal with it this way:

"Where a water fitting is installed, altered, connected or disconnected by a approved contractor, the contractor shall upon completion of the work furnish a signed certificate stating whether the water fitting complies with the requirements of these Regulations to the person who commissioned the work."

Over the page, about penalty, in regulation 7:

"Subject to the following provisions of this

regulation, a person who --

(a) contravenes ..."

Then it includes (6), which I have just read out, and subregulation (2) you see:

"In any proceedings against an owner or occupier for an offence under paragraph (1) which is based on the installation, alteration, repair, connection or disconnection of a water fitting, it shall be a defence to prove --

(a) that the work in question was carried out by or under the direction of an approved contractor; and

(b) that the contractor certified to the person who commissioned that work that the water fitting complied with the requirements of these Regulations."

Do you see that?

A. Yes.

Q. In a nutshell, the UK regime again puts the responsibility of what is called the approved contractor, and if I commission -- I as owner of a property -- fitting of plumbing work, I go to an approved contractor. He, having done the work, issued me with a certificate to certify that piece of

work was done in compliance with the regulations, then he takes the responsibility. If he refuses to certify the work or issue a certificate, then he falls foul of regulation 7, he may commit an offence. And if somehow I am prosecuted, say some aspect of the works is not in compliance with running of pipes or use of materials or whatnot, if something goes wrong and I am prosecuted, I can show that piece of certificate that is issued to me as a defence to my liability?

A. Absolutely.

Q. That's the UK regime, it seems?

A. Yes. When it comes to approved contractors, it's a bit more vague.

Q. Yes. Of course, we don't necessarily have approved contractors or whatever, but assuming -- transpose it to licensed plumbers?

A. That would be perfectly reasonable. In fact, I would say that the licensed plumber situation that you have in Hong Kong, if it was strengthened, would be stronger and more effective than the UK system, although the UK

system is gradually evolving to a system which would be, I suspect, not so different from that in Hong Kong.

Q. Right. So again it comes back to this point. Now, when it comes to plumbing work -- of course, we are not just -- let's lift our eyes away from applying solder, because plumbing work --

A. Yes. It's more than that.

Q. I think applying solder is probably a very small part of the plumbing work that we are talking about, and really you do need specialised people, like licensed plumbers --

A. Yes.

Q. -- to undertake all that very sophisticated plumbing work in multi-storey buildings. Responsibility rests -- is pivotal to ensuring not just the performance, the functional performance, but also to have an eye on the ball, being quality of the water?

A. Absolutely. This is absolutely right. We have been trying to strengthen this in countries all over the world, because the people who are installing the

plumbing -- you can't see water quality normally, and therefore it is doubly important. Whereas you can go and check wiring or whatever, electricity, it is not so simple for plumbing, and therefore we would like to see that strengthened.

Q. That's right. Of course, I'm not being disingenuous.

If that is the case, by comparison, you don't really want to put the onus on the property owner that much, because we are not talking about large developers here. Also, if we are looking at the regulatory regime, we may be talking about very small individual owners, and we may come into difficulty if one were to say, "Then we put some responsibility on the owners"?

A. Yes. The responsibility that falls on the owner is to make sure that the work is done properly --

Q. By a registered --

A. -- preferably by --

Q. Yes, because if I engage somebody to do the piping of my flat, I wouldn't be able to supervise; I would have to rely on him, being the expert, to do it properly?

A. Yes. There is a danger that we have some difficulty here, because in Hong Kong, things are rather different to -- in the UK, we have a lot of "do it yourself" enthusiasts, and there are some difficulties there, in controlling them, and also in applying liability. If somebody pollutes their own supply, the government are unlikely to prosecute them.

Q. As you say, we are not in the DIY situation. In Hong Kong there is no DIY, because all plumbing works should only be conducted -- done by the licensed plumber, so in Hong Kong the situation is very different.

A. It is indeed.

Q. If I engage a licensed plumber, then the responsibility should not be on the owner?

A. That's correct, that the responsibility is that the owner has taken the appropriate steps to ensure that the licensed person has the appropriate licence and is current.

Q. And where it falls down is that there is perhaps lack of

awareness on the part of the licensed plumber to know that they have to do their job properly?

A. I think there's probably a lack of awareness right through the chain, because that chain needs to be strengthened, as the chairman has said.

Q. Thank you. Given that regime -- I know lots of things ought to be tightened up to make that regime work -- but assuming we already have a framework, we already have a regime where the plumbing works are done by supposedly a specialist, professional person?

A. Yes.

Q. Then I note what you say, that other stakeholders would of course have to join in to make sure the whole thing becomes effective. I understand you to be staying that; I'm not misunderstanding you?

A. No, but you wouldn't necessarily -- you don't necessarily have to have everybody as a licensed plumber.

Q. No.

A. It could be that the licensed plumber is supervising others who may not be at the level of a licensed plumber

but have demonstrable skills.

Q. Yes. That points to perhaps a different question. But what I am saying is, given the legislative set-up, primarily pivotal to ensuring proper installation, including the use of the right materials, falls on the licensed plumber --

A. Yes.

Q. -- then, as far as you then say, well, other stakeholders also have a role, that will be a role subsidiary to the licensed plumber?

A. Subsidiary?

Q. Ancillary.

A. Yes. That's a better word. Thank you.

Q. Sorry. You are more a lawyer than I am! Right.

Given that that was the set-up -- now, if we had good licensed plumbers -- I'm sure perhaps we have seen some let-downs doubts but hopefully that is not a phenomenon across the whole trade in Hong Kong --

A. If you had universally very, very good, very knowledgeable, licensed plumbers, you wouldn't have had the problem that you had.

Q. Exactly that.

Then we look at the ancillary stakeholders' role, in the light of assuming we have good licensed plumbers; right? Then I am of course -- I don't know whether you are aware that, for example, the main contractors engage a subcontractor to do the plumbing work. They would ensure that a licensed plumber is engaged for that purpose.

A. Yes, I am aware of that.

Q. Invariably, because the main contractors obviously don't want to get into trouble by engaging somebody who is not a licensed plumber to deal with these works.

A. No.

Q. They are contractually required to ensure that the works performed comply with the main contract; you are aware of that?

A. Yes.

Q. So that's one level of a control there, would you say?

A. Yes, clearly.

Q. Then higher, there is a layer of the relationship of the main contractor and then the developer?

A. Absolutely.

Q. And this is where another contract comes in.

A. Yes.

Q. The main contract, that the developer grants to the main contractor, to build that estate?

A. And each step up, the importance of the plumbing becomes diluted, because you have a larger contract, and the process, strictly speaking, should be designed to make sure that because you are using specialists for specialist tasks, that should prevent the problems happening that did happen.

Q. You say "diluted" meaning people more remote from the licensed plumbers becomes less in touch with the importance of the --

A. No. They have a whole range of very important issues that they have to deal with, right back to what I was saying yesterday, making sure that the building doesn't fall down. So they have a whole range of different things, and equally they are very, very important. But plumbing may not be seen -- because in the whole relation to a project like that, it is a relatively small part, but it is a very important part. That's why

it is important to have specialists and a system that ensures that that is delivered properly, because the long-term impact can be quite significant.

Q. Again, that's where your eyes on the ball becomes important. Because it's a small part, it may be overlooked, then somebody would have to draw everybody's eyeballs back to the ball?

A. Absolutely.

Q. Then we go back to the whole philosophy about that paper, water safety plans, and all that comes in?

A. Yes. Within a water safety plan, one of the parts of that would be that you must have an appropriately qualified person who is aware of their requirements, and so on. So that's --

Q. Risk identification, hazard identification and all that comes in?

A. Yes. To an extent, you have that already; it's just not laid out in that form, and would perhaps benefit from being laid out in that form.

Q. Yes. One gets wise after the event. If we had the water safety plans earlier, then perhaps --

A. That's what water safety plans partly are supposed to be about, learning from experience.

Q. Yes. I'm just trying to see whether you are aware of some of the factual matters in this case. Now, it's not the case -- I say "HA"; HA or HD, it doesn't matter -- that the Housing Authority just say, "Okay, we have this provision in the contract and we wash our hands of it already" -- it really is not that.

A. I am aware of that, and I have discussed it with the Housing Department, senior people within the Housing Department. It's not at all that. It's a matter of it gets lost in all the other stuff, and that's why having in place the appropriate requirements, and understanding from individuals of the importance of their particular area, but also it has to be seen at a very high level, at the higher supervisory level, the understanding that this is important, and when the person who's responsible, perhaps the licensed plumber, says, "This is important, we have to do this", they take notice, because they have some responsibility in this.

Q. Yes. This is why I don't want anybody to misread your report, especially paragraph 47, where you talk in terms of the HA responsibility and role; paragraph 78, you again refer to HA's responsibility and role.

A. Yes.

Q. I just want to put those two paragraphs in context of our discussion so far. The regulatory regime, the existing regime that we have -- we have the licensed plumbers, we have WSD; these are the entities, shall we say, who should have their eyes on the quality of the water -- "should". Whether they did is probably a different question. "Should"; you would agree with that?

A. Not necessarily, because it depends on the structure, regulatory structure that you have in place.

Q. I've been through all that with you.

A. You can't say -- that's why I'm not prepared to --

Q. No. I'm just -- I think I'm trying to give you the balanced approach.

A. Okay.

Q. It's not that nobody else should even look at it. I'm

not saying that for one moment.

A. No.

Q. But primarily, the ones in a big project, complex project like this -- I think you yesterday also said, "Yes, these other people, quite rightly, their primary priority was to make sure that the building that they have put up is not going to fall down, so they may have lost sight of water quality." That's your evidence yesterday.

A. Yes.

Q. So eyes on the ball.

A. Yes.

Q. And I'm saying, in this scheme of things, when you make your comment in paragraphs 47 and 78, we have to look at the situation where, in a multi-faceted construction project, when it is likely that other people have their eyes on some other matters of priority to them, then if one has to introduce back into that monitoring system the monitoring of water quality, then the job is really primarily on the experts.

A. Yes, but there is a requirement at the higher level, at

the early stages of, let's say, the project that when requirements are put into a contract, that the people putting together the contract understand why those requirements are there. It was very, very clear, from the evidence given, that there was no understanding of why there were requirements in that contract. So it starts to crumble a little bit around the edges here.

Q. In order to make people understand, again, the need for heightened awareness, you need to identify that as something you should watch out for?

A. I would argue with you that if you highlighted an item within a contract, you, to an extent, should know that that is important. If it's not important, why is it in the contract specifically highlighted?

Q. I just want to draw attention to a few things, to see whether you have any comment. In the project administration, in a project administration, for example like HA as developer of the project, they would require -- HA had a requirement that main contractors --

A. Yes.

Q. -- should manage their subcontractors. You are aware of that?

A. I am aware of that.

Q. Of course, in this connection, managing subcontractors to perform duties required under the main contract also means monitoring use of correct materials; you are aware of that?

A. It does. It does.

Q. Also, are you aware that the main contractors submit --

A. Yes.

Q. -- the subcontractors', what is it, management plans --

A. Yes.

Q. -- to the HA, in which, on paper, they say they will monitor the use of correct materials? Are you aware of that?

A. Yes, I am aware of that, and that's why I have made the recommendation that in the contracts, before the contracts are let, it's very important that the HA make sure that there is a quality assurance train put in place by the contractor, to make sure that things like

this are actually followed through. And that's in the interests of the HA as letting the contract.

Q. Of course there is this process of the approval of the use of materials, and you are aware of that?

A. Yes.

Q. There is no suggestion in these proceedings at all that an approval system has gone wrong. It's not the approval, because when it is submitted for approval, solder was submitted and was approved, and the substance that has been approved is FRY 99. So, in that aspect, there is an approval system in place, and in this case it's not because the approval system has gone wrong?

Are you aware of that?

A. Yes, I'm aware of that, and it's somewhere that I'm not -- I have some difficulties with what you are saying. I think the reason that the system has gone wrong is because the approval is very much a case of just looking at what the paper says, "We are going to use the right materials, this is the list of materials we are going to use". And again I would re-emphasise, my recommendation is there is a quality assurance -- the

HA need to make sure there's a quality assurance process in place before they let the contract, as part of the contract requirements.

Q. Yes. This is --

A. To make sure that all the way down --

Q. I understand that. But perhaps you can address my question. In the quality assurance -- in the contract, there is a requirement that the main contractor will have to use approved materials; subcontractor will have to use materials that comply with the main contract, which indirectly means they also have to use the correct materials.

There is in place an approval system, and in this case the approval system has -- there is nothing to suggest the approval system falls short in the sense of wrongly approving leaded materials to go into the plumbing works. The approval system has shown that only FRY 99C grade lead-free solder should be used.

A. Will be used, yes.

Q. So it's not to do with letting out the contract or the approval system. These are control measures, would you

not say? According to the flowchart, these are control measures that are properly in place?

A. They are not presented in quite that way at this stage, because the importance of them as control measures is clearly, from the evidence of senior staff in HD, not understood. So there are some issues in the climate of approval, perhaps that's a way of saying it. If you don't understand the reason why it's important, then the emphasis in the contract is perhaps not as strong as it ought to be, or the application of the contract, shall I say.

Q. I understand you. You are not saying somehow this control measure itself is defective. It's people involved in the control --

A. Absolutely.

Q. Again, it's a question of implementation -- people involved in this control you say should have a heightened awareness of why particular things are put there as control?

A. Yes, or in this case at least some awareness.

Q. Some awareness, yes. Well we heard that they had a

general awareness of the health effect of lead but not --

A. Well, the chief architect said that he wasn't aware that lead could be a problem.

Q. But we had other evidence as well.

A. Yes.

Q. Then the question really is that -- again, it's not the question of somehow this system is -- these monitoring measures or controls are wrongly placed. It's not. These are proper controls in the system?

A. It has been throughout the implementation of the controls.

Q. Exactly. Then it comes to -- implementation, of course -- we are looking here not wholescale of standards falling short, but then, on a very specific matter of the solder posing -- which is allowed to leach, the wrong kind of use of the material with the result of lead leaching into the water --

A. And also some of the figures.

Q. -- then it's a very specific risk, isn't it? It's not the wholescale of things breaking down, or your control breaking down?

A. That's one of the issues. It is very specific but it's very importantly specific, and also the use of the low-lead copper alloy fittings; it's another area.

Understanding why that's important is key to appropriate implementation.

Q. Yes. Now, I don't think we -- I believe --

A. I think we are saying the same thing.

Q. We are stating more or less the same thing; it's just a question of emphasis.

A. (Nodded head).

Q. Then ultimately I have to say, understanding of course, as you say, why people have taken their eyes off the ball was because maybe for a long time nothing has gone wrong, so people have lowered awareness?

A. That's what the water safety plan is supposed to fix.

Q. Exactly.

A. By having processes in place and being renewed and reviewed, that is supposed to take away the risk of people saying, "It's never happened so it's not going to happen again."

Q. Exactly. That was where all that risk management, risk identification, all of that comes back into the picture? You agree?

A. Yes. Absolutely.

CHAIRMAN: But then when copper pipes were introduced in, say, 2002 to 2005, the HA simply did not conduct or did not identify any hazard in respect of lead at all?

A. No.

CHAIRMAN: And therefore there was simply no risk assessment whatever?

A. Yes, from what I've seen, that was the assumption, but it's more or less what you (indicating Mr Ho) are also saying, that because there was a requirement in place for low-lead solder at that time, it was just assumed that you would not get any of the other hazards. There wasn't a proper hazard assessment and risk assessment, and the hazard assessment was, "Well, lead can come from solder. We've put this process in place. Is it possible for lead solder to be used?"

MR HO: Yes.

A. And the answer, quite clearly, has been "yes".

CHAIRMAN: Not only lead solder but, as we have looked at the specifications, in fact save and except for a few items, almost all the materials within the plumbing systems have not been required or were not required for QC or checking whatsoever.

A. That's right.

MR HO: Of course we will have to deal with that, but the question also is those people -- for example, the plumbers, WSD, who have or at least should have their eyes on the ball should actually raise -- if they see that that may be an instance where there might be a risk, to raise it?

A. Yes, and I think there is also an issue around as to the procedures that they have in place at that level on a day-to-day basis, to ensure that things don't go wrong.

When people -- let's say plumbers -- when the plumbers are under pressure to get work completed, if you run out of unleaded solder, are you going to, if particularly -- I don't know what the contract conditions are for them, but if you are not getting paid

while you go off to find some unleaded solder, and you happen to have some leaded solder, there will be a very strong temptation to use it.

Q. Yes. That comes back to the actual monitoring of materials delivered on site, and so on.

A. And ensuring that the process of supply, et cetera, is appropriate for the circumstances.

Q. To that extent, of course, you know it's the main contractors -- I have already put it to you that in the subcontractor's monitoring plan, it says they will make sure that the correct materials are being delivered to site.

A. Yes, and there's been effectively a series of failures in that respect.

Q. Right. Of course, then -- yesterday, I think counsel for the Commission has canvassed with you certain aspects of the verification aspect, like the form 6210 of the HA. Now, are you aware that in fact that form is updated through a process, again, of assessing what are items that may go wrong and addressing the relevant items?

A. I'm not specifically aware of it. I would be surprised if it wasn't updated at intervals because of --

Q. Yes, and that is the result of, I don't know whether you are aware of the deputy director's evidence, when she came along and gave evidence quite early on in these proceedings. She said that updating the process depends very much, for example, on whether or not in the past there's been a problem with certain materials?

A. Yes, I was aware of that.

Q. Again, that's a matter of risk assessment there?

A. Well, it's also -- it's risk assessment and understanding the hazards, both of those two, and if you don't understand the hazards, if you are not aware of the hazards, then you are not aware of the risks.

Q. Of course, you are not suggesting that -- because people in the position like a developer, like the HA in this case -- perhaps it also applies to other private developers as well -- you know, they should 100 per cent check on materials delivered on site. I don't see that as your recommendation?

A. No. I think they should be delegating -- there should

be a clear delegation, clear responsibilities, clear demarcation of responsibilities, and that has to be clear. I haven't seen the contracts themselves. I obviously wasn't here when the process was going on. But having talked to a number of people who were involved, fundamentally everybody is so busy, there was not the proper presentation or clarification of that sort of --

Q. But it wouldn't -- on a complex project like the high building blocks we have, it wouldn't be an efficient use of resources, if the developer were then to monitor each item of materials that come onto the site? It's just practically impossible.

A. Right, but the process that's been suggested solves that problem, that for some of these smaller items which are difficult to identify, that there is central purchasing.

Q. Of course, this is what is being recommended. But I'm just saying, before these recommendations, and I see in your report you have actually endorsed these recommendations as being positive and constructive and I think you also used the word "appropriate" -- but even before the introduction of these measures, you don't

expect the developer to have to devote the resources of having to check on materials 100 per cent? It must be a sort of selective process?

A. Yes, and basically, what I would expect the developer to do -- that the developer knows their responsibilities and that they have overall responsibility. The contractor, for example --

Q. On the construction side of things.

A. Absolutely, and I would expect them to have in place procedures that will ensure that their subcontractors and others will properly carry out the checks that are needed.

Q. Yes. This is where I think counsel for the Commission yesterday was also saying -- now, in contract administration, it's not just developer, main contractors, subcontractors.

A. No, no.

Q. But to avoid people taking their eyes off water quality, then WSD does have a role to play, even in the contract administration, the project administration?

You have agreed with my learned friend there.

A. I think that they do have a role, but again it goes back to consultation.

Q. Engagement?

A. Yes.

Q. Right. I understand "engagement", because you use "engagement" in a very special sense.

A. Engagement is a two-way process and it's something that I believe is very important for Hong Kong, that departments, groups, need to be prepared to engage a lot more. It's not an erosion of their authority. It's a reaffirmation of their authority.

Q. And the engagement that we saw -- I apologise if I'm repeating myself -- has been also that when copper pipes were introduced, the WSD was specifically asked to comment about the use of copper pipes. That's a form of engagement, isn't it?

CHAIRMAN: I think there are also constant, regular meetings between the WSD and the HD, regular meetings between them, to exchange different views on matters. So there are the platforms, but exactly what they talk about,

that's another matter.

A. I would agree, Chairman. I was about to ask that: what do they actually cover and is it really important stuff?

MR HO: The old chestnut: really, perhaps the ball has not been particularly identified for the eyes to focus on?

A. Yes. I think that's a very good way of saying it. I think now that we have had something that's gone wrong, there's nothing like something going wrong to focus minds on what they should be focusing on. As long as it doesn't take them away from things that are important that they have been dealing with.

CHAIRMAN: It's now 1 o'clock, and I think some of you do have lunch engagements. Let's go to our engagements.

下午1時正聆訊押後

下午2時30分恢復聆訊

CHAIRMAN: Yes.

MR HO: Professor, there are just a couple of perhaps smaller points that I want to discuss with you.

Can I invite you to go to paragraph 94 of your report, please, at page 123.

So understand your paragraph in a perhaps more

positive and constructive light, are you suggesting that now that the incident has come to light, there should be a more co-ordinated effort? You here, in the fourth line of the paragraph, suggest a manual covering installation of plumbing works in buildings Hong Kong.

Do you see that?

A. Yes.

Q. Is that the sort of water safety plans that you have in mind in making that comment?

A. Yes, and it would be really taking the process and then developing, using that to develop a document that would help all parties, putting all of the information in one place, and pulling the various points together, because one of the things that is apparent is that information is quite diffuse.

Q. Right. I see.

A. It's an opportunity for the two departments to actually pull together the information and the requirements and put them in one place so --

Q. No -- sorry.

A. No, no, that's --

Q. Because I notice that you seem to suggest that there should be a manual, you say "covering the installation of plumbing in buildings in Hong Kong" -- now, you are not confining yourself, for example, to public housing? You are thinking of something larger; am I reading you correctly?

A. Yes. I am thinking of something broader than just the public housing.

Q. Broader.

A. Plumbing takes place -- plumbing goes into loads of buildings and it is not unreasonable that there should be a document that guides everybody.

Q. Indeed. You are not just thinking about the WSD or the HA, who mainly deal with public housing; you are also thinking about, for example, other government buildings it would be the ASD or the Buildings Department, or even private developers or institutes of whatever?

A. Yes, I think they would have an input, and this is a real opportunity for Hong Kong to deal with the plumbing issue on a much broader basis, to ensure that

in the future problems are not going to arise, whether they be in public buildings or private housing or in public housing, and avoiding the problems for the future would be good.

I think that the experience that the WSD and HD have had over this incident puts them in a very, very good position to take the lead on something like this.

Q. Certainly. I read that as an invitation that there should be co-ordinated efforts for not just the two named departments there --

A. Absolutely.

Q. -- but, you know, on a broader scale including other perhaps other stakeholders which perhaps have not been expressly mentioned here?

A. Absolutely. I just left it as "stakeholders", because that can include -- I don't know all of the different groups in Hong Kong. So that would include whoever is appropriate.

Q. Do you envisage a separate document for, say, water supply as opposed to drainage and sewage?

A. I think there are advantages in having one document with three separate sections, or you could have one document.

It gives you the opportunity to start the process, and having got one document then you can move on to others, because I know how these things take time, and having a model document is actually quite beneficial.

We have a situation here where this relates to public health directly, and plumbing is very important. In terms of water safety plans, you have there a reason for dealing with it, and to an extent you could also incorporate management procedures for such things -- building management procedures of plumbing for such things as Legionella control.

Q. Thank you.

There is just one minor point I would like to discuss with you. That goes back to paragraph 18 in your report, please, on page 95. In paragraph 18, the premise there is that the task force, in their report, have looked at three houses, two from Kai Ching and one from Kwai Luen, and there they have done isotopic tests --

A. Yes.

Q. -- and so on, to find out whether in fact the lead is

mostly contributed from the solder or maybe other parts of the plumbing system.

A. Yes.

Q. So that's the context. You say then, over the page, at the top of page 96:

"... it is reasonable to make a worst case assumption that the findings of the report would apply to all of the developments ..."

What I understand you there to be saying is that of these 11 estates, even though the task force has looked at two houses, two blocks from Kai Ching, one from Kwai Luen, but it is a reasonable assumption that the same may apply to the other nine estates, and therefore one can make a worst-case assumption they probably did; that's the scenario that we are looking at?

A. Yes. My view is that taking a worst-case assumption from that is the best possible position. You are not making assumptions that all is well when it's not.

Q. Right.

A. And in view of the fact that you needed to make some progress, going back and sampling and going through the

full process, all of the other buildings would take a long time.

Q. So you make an assumption that what you found in Kai Ching and Kwai Luen may apply to the other nine estates?

A. Yes, and then you can go back and do sampling as appropriate.

Q. This is where I want -- your last sentence here, this is

where I want to draw your attention to. Of course, now, I don't know whether you are aware that remedial works -- you talk about remedial works in the last sentence of that paragraph.

A. Yes.

Q. I don't know if you are aware, in fact remedial works are being undertaken to replace the parts that may be affected by the solder --

A. Yes. I have been made aware of that since I arrived in Hong Kong.

Q. So we are not going back to further testings, because the worst-case assumption has in fact been adopted, and

then remedial works are being undertaken in all of the 11 estates? You are aware of that?

A. I am now aware of that, so that, to an extent, is redundant as a recommendation.

MR HO: Thank you. Thank you very much, Professor. I am very obliged for you to have put up with my questions. Thank you.

Cross-examination by MR LEE

MR LEE: Professor, you said that you would use two terms interchangeably, "Housing Authority" and "Housing Department"; is that right?

A. I have done that, yes.

Q. I think most of us have done that and will continue to do that. Don't worry about it. But do you also use other two terms interchangeably, "Water Authority" and "Water Supplies Department"?

A. I have used Water Authority very rarely. It's mostly "Water Supplies Department".

Q. Because you are aware of the distinction?

A. There is a distinction, yes, but there is also a blurring of the boundary between the two.

Q. I can see that you are a little saddened by the fact that the two departments don't seem to be tangoing together?

A. I am concerned this seems to be a situation that I have seen in a number of circumstances in Hong Kong where there is a lot of compartmentalisation, and compartmentalisation often leads to a lack of proper co-ordination between different groups.

Q. Even during this hearing, you see two different groups of lawyers.

A. Yes.

Q. In a way, they are really two men in the same boat, and if the boat sinks, they both get into lead-infested water?

A. Yes. Yes.

Q. You have been asked questions on the framework of water safety.

A. Yes.

Q. But there is also a manual, isn't there? I will give you just a few pages to look at and ask you just a few questions on it.

The origin of this, this is a photostat copy, one of my juniors actually went to the web and he has photostatted it now. I'm sure you have seen that before? (Handed).

A. I am aware of this.

Q. I am sure you are familiar with it.

If you start from the second page and turn to the back page, you see a chart.

A. Yes.

Q. Most of the things there, of course, are already to be found in the framework?

A. Yes.

Q. You see for instance at the top you have "Preparation", and then in the left side you have "Feedback" and then in the middle you have "System assessment, operational monitoring", and then "Management and communication", and on the right-hand side you have "Upgrade". I shan't read the other words because I haven't read them before and I don't intend to read them now, but I assume it's the same as the framework.

Then if you look at the contents, these are the

sorts of things that you would expect to find in any well-prepared water safety plan; right?

A. Correct. There may be modifications. It is a guidance and it is intended to be used with thought and care.

Q. Yes. But you have been looking at Hong Kong's own water safety plan, different versions of it; right?

A. Not so much the water safety plan but the layout of -- and indeed it's not --

Q. You don't consider that to be a plan?

A. I don't consider that to be a water safety plan. A water safety plan has got a lot more to it and you cannot -- a water safety plan is not just a single document.

Q. No. But the trouble is they call it a plan, a water safety plan.

A. That's because that tends to be shorthand. I don't want to get into areas where I suspect I may not be in a position to answer, because I have not spent a significant amount of time with the department, in order to go through the process of the water safety plan --

Q. But you have read that document?

A. I've read the document, yes.

Q. And from what you have said so far in answer to my questions, I don't suppose you would consider it actually to be a water safety plan as such?

A. It's the outline of the plan that's being put in place by the WSD.

Q. It's a skeleton, or not even a full skeleton?

A. A little bit more detail but basically it's a skeleton, and of course they've got the complexity of the fact that they've got a whole series of different sources, different treatment plants, and so on. So they talk about how that's dealt with, and that's very important, and I fully accept that and agree with that.

Q. You mean you don't consider it to be a water safety plan as such?

A. That's not the water safety plan. A water safety plan is not just a document. A water safety plan goes way beyond that, and it's got a whole range of different steps in for different treatment works. It's simply not possible to put that into that document. There will be a number of other supporting documents which are really

important for it.

Q. Of course you cannot, in the context of this case, for this public housing -- you cannot have a water safety plan in relation to these houses or these blocks when the water stops at the connection point?

A. That's not strictly true.

Q. You mean you can have a water safety plan when it stops at the connection point?

A. We are in danger of going back to lists of chemicals and the guidelines, the guidelines and the guidelines and the guidelines. They provide guidance. With a water safety plan, a water safety plan -- there isn't a particular form of a water safety plan, but a water safety plan should try and cover something about internal plumbing systems and delivery to the tap. That may be, in some cases, may start off as being very, very basic, but it can go on to eventually develop into something much more extensive. And the plan can take a number of different forms. There may be a range of versions of what will be done in management within buildings.

So, yes, it's possible, but it's not possible for WSD to do it on their own. That is not possible, and they would need to work with other stakeholders in order to do that. But it wouldn't necessarily be their first priority. Their first priority would be to start the process of the supply train.

Q. Of course. I know you are a very charitable man. You are trying to be nice.

A. No, I'm being honest. Having worked with water safety plans and --

Q. So that cannot be a water safety plan, can it?

A. Yes, it --

Q. They don't really care what happens to the water once it passes beyond the connection point. They don't even care anymore.

A. I don't think you can say that. In terms of a water safety plan, you go as far as you can and then you start to develop beyond. They have dealt with much of what is directly under their control. There is a need for that to go further, and that development further will involve

a lot of other people.

Where my criticism lies is that in the initial establishment of the process of water safety plans, I think the level of engagement, to use the term again, with other important stakeholders has not -- I do not see that clearly in the information that I have been given and I've been able to see, and in the discussions.

Q. So they haven't reached even base 1?

A. Yes, they have reached base 1. They've done quite a lot.

Q. Well, what is that?

A. And the water safety plan with regard to the treatment works, certainly, and much of the catchment; I think things can go further.

But a water safety plan must not be considered as something which is prepared and that's it. That's not how it works. It should work by you start off with what you've got available, you make sure that the processes you have in place are working properly and efficiently at all times, and that is often a starting point. But you certainly don't have, "That's your plan." It will

develop and it will continue to develop over time, and I would hope and I would anticipate that WSD will continue to develop those plans, and following this Inquiry I'm sincerely expecting that they will be working with the HD and other stakeholders to take the plan over the next stages.

Q. Professor, you are not only a charitable man, you are also a man of hope. You are hoping that they will --

A. I have every reason -- I have seen every reason to believe that this is going to happen.

Q. Yes, I also want that to happen, because I represent the people who have been somewhat affected by this; right?

But you see, the trouble is, the Water Supplies Department want to go back, according to some questions asked you of this morning -- you see, instead of "from source to tap", it's no longer from source to tap, so how can it be a safety plan?

A. The safety plan has -- you are asking something different to a water safety plan. You are saying, in terms of the responsibilities and statutory

responsibilities, et cetera, should WSD have

responsibility right through --

Q. No.

A. But that's exactly what you are implying, because in a water safety plan, WHO recognised that there may not be the authority available to deal with different bits. So a water supplier may not -- it is recognised fully --

that they may not be able to fully engage in what happens within buildings, because it may be outside their control, and so on.

There is an issue here and that is in terms of how Hong Kong decides that it wants to determine the responsibility, and regulatory responsibility. That is not clear.

The problem that I have encountered is that it is not clear, and it is difficult for a department that's already taken or it is agreed that a position is taken, that then they say, "We are going to extend our authority beyond this point."

It is what should have happened -- and this is where I would agree -- I think WSD and the other stakeholders, Housing Department, et cetera, in this particular case,

HD, should have been talking much more closely, and understanding that there is a need to ensure that water quality in buildings is covered.

And the point about the Legionella is a particularly pertinent point, because that is something that many, many countries have approaches to managing and dealing with water in buildings, in order to manage to prevent Legionella. It's not just in air-conditioning units.

Q. No.

A. So what you are saying is really to take a position that is pushing for me to say that they should have had authority to a particular point, but I can say that many other countries don't have that.

Q. I don't think you understand my question. You have given me a very long answer. The question is very simple. I'm looking at it from the consumers' point of view, and when you talk about the safety of water, water safety, I suppose it includes drinking water?

A. It does include drinking water.

Q. And I get my drinking water from the tap.

A. Yes.

Q. So if it is not even included in the grand plan, water safety plan, the water which comes to me in the tap is excluded, because the water stops at the connection point, so how can it be a water safety plan?

A. Sorry, that's not how a water safety plan works. That is not how a water safety plan works. And a water safety plan is not a replacement for regulation. It is an adjunct to regulation.

Q. Yes, in case something goes wrong, then they know how to react quickly?

A. And also they can -- it responds, and it develops, and it builds over time.

Q. Oh, yes. But the overall objective is to ensure that the quality of the water is good, the water which comes to the consumer?

A. Is safe.

Q. That's the whole object of it.

A. The overall objective.

Q. I know there may be all sorts of difficulties encountered. I'm not accepting it, but even assume that

the Water Supplies Department have no control over the water once it gets into the public housing -- even assuming that; I'm not putting the blame on them yet -- all I'm saying is if that is so, then the document they have prepared cannot properly be called a water safety plan?

A. I'm sorry, but it can. The WHO does not see this as being you have to have something all the way from source to tap to start with. It's something which is under the control -- it starts off with the water supplier. It's very important that they have control over the water supply parts.

Q. So does the WHO consider that a plan can be properly called a water safety plan when the water stops at the connection point?

A. Well, it doesn't stop. The water safety plan will go to whatever bit that you want to take it to.

Q. So a water safety plan in this context, as far as the Water Supplies Department is concerned, is their plan to make sure that the water is safe when it reaches the

connection point?

CHAIRMAN: I think there are many different kinds of water safety plans.

A. Absolutely, yes.

CHAIRMAN: There are water safety plans for, say, the reservoir, there are water safety plans for treatment, and there are water safety plans, say, in Hong Kong, for pumping stations or pumping substations, et cetera. So these can be regarded as proper water safety plans.

But what you are talking is a different species. You are putting all those that I have mentioned aside and you are concentrating solely on the public housing estates.

MR LEE: For this reason: because those plans have nothing to do with the consumers. They may not have anything to do with Housing.

CHAIRMAN: I understand that. So at present there is no such water safety plan for housing estates and there's no water safety plan for, say, even private developments.

So I think the Professor definitely will accept

that. So when you are talking about a water safety plan you have to be specific in order to elicit what you want.

MR LEE: What I want is simply the water which reaches the consumer, but if you tell me no, for the purpose of this case, there is no such plan, then okay, I --

CHAIRMAN: There is no such plan after the connection point.

MR LEE: Is that right?

A. At the moment.

Q. I don't know whether you have read this book, "Hong Kong Water Supply -- Reducing Lead in Drinking Water" -- A1, tab 21, published by the Government Logistics Department, but obviously you can see the information that has come from the Water Supplies Department. It's a document like this, a little book.

A. Yes, and I've copy of this at home.

Q. Have you read this before?

A. I have.

Q. Then if you turn to page 1, it says, "Drinking water supply in Hong Kong":

"The Water Supplies Department (WSD) is committed to

providing quality drinking water 24 hours a day to the public."

Then it talks about "raw water from Dongjiang" and so on. Then right at the end, the last sentence:

"It is then routed through building's internal plumbing system which includes a sump tank, a roof tank, pipes and fittings before reaching the customer's tap."

Then if you turn over to the next page, you see a plan -- you see the lot boundary, and so on; right? This is page 2 and page 3. Then if you turn to page 4, at the top you see, "Water quality conforms to international standards", and then on both sides you have "100 per cent premium", with stars, and so on, and then "Water Quality Conforms to International Standards".

"The quality of drinking water supplied by the WSD fully conforms to the WHO Guidelines. A Water Safety Plan in accordance with the WHO Guidelines has been in place since 2007 to further ensure a safe water supply to customers."

That is why I am asking you these questions; do you understand? I took them to mean they already have

a water safety plan, in accordance with the WHO Guidelines, since 2007, and so the consumers ought to feel safe?

A. They have, but WHO, in its advice on water safety plans, does indicate that if you don't have the control over the building, then you need to get in other stakeholders and there needs to be a different approach to the way that that is delivered.

Q. Yes.

A. Now, they are providing water, according to their summary. Where I would say there is a problem here is where they call about lead, chromium, cadmium and nickel et cetera. There I would say since the sampling for that needs to be at the tap, one can argue that that is slightly misleading.

Q. The whole thing -- I think the whole concept is at the tap. The whole concept is at the tap, right from the beginning, page 1, "Reaching the customer's tap."

A. It doesn't specifically say that, and the reason it doesn't specifically say that is that many of the parameters that are in the guidelines -- and this is

a problem with just taking the guidelines -- many of the parameters that are in the guidelines are covered by raw water treatment and distribution, and they will not change in the building. There are a limited number of parameters that change in the building.

Q. The point is, when a customer gets a booklet like this, he reads it and he feels very happy; the water is safe?

A. That's a completely different question, whether the booklet is helpful or misleading for consumers is a completely different question and I'm not prepared to comment on it.

Q. I agree, but my question is that actually the water people, the Water Supplies Department people, considered that their document already is a water safety plan, in accordance with WHO Guidelines. This is how they consider it, and they want the citizens of Hong Kong to read it that way?

A. And on this they point out that the waterworks and the Water Supplies Department finish at the lot boundary. So, in actual fact, it is not clear -- it doesn't make it as clear as it should be, but it is trying to make

out that the water safety plan is something that it is not.

Q. Precisely.

A. No, you are trying to make out --

Q. Sorry, I'm following their thinking. The chairman correctly put to me that there were other plans and these other plans would stop at the connection point. But I am looking at their own document, which disavows that. It says all the way to the tap.

CHAIRMAN: I don't think Prof Fawell can speak on behalf of the WSD.

MR LEE: All right.

CHAIRMAN: I think the witness for next week, one of the witnesses is the deputy director. You should direct your questions to the deputy director.

MR LEE: Yes, I will do.

CHAIRMAN: I understand what you are saying.

A. I understand, Mr Chairman. I'm not prepared to answer but I understand.

MR LEE: Maybe I'm the only person who doesn't understand.

CHAIRMAN: So what you are saying, in effect, Mr Lee, is

that the first statement in fact is a half-true statement?

MR LEE: Yes. But they all, from the customer's point of view, they all want to see this water safety plan, but there has to be a water safety plan in accordance with the WHO Guidelines, and so far we haven't got it?

A. With respect, I would say that what customers want is water that meets the standards.

Q. Of course. Of course.

A. That's slightly different.

Q. I know. We are all agreed on one thing, and that is the water I drink has to be safe.

A. Yes.

Q. And so far I know it's safe because it's from inside a bottle.

A. Do you know? And what is your basis for that?

Q. I opened it this morning --

A. You've been told it's in a bottle, you've been told that it's safe; you have no verification for that.

Q. Not even that, more than that, I found it in the bottle and I had to open it like this (demonstrating), but

I agree with you, it could still have been tap water, it could still be?

A. It could very easily be all sorts of water.

Q. Yes, yes. I also saw TV programmes to say that in fact sometimes tap water is cleaner than bottled water?

A. It can be, and one has to be very careful. What you are trying to do is really say, well, we need to have standards, we need to be able to demonstrate to the public, to consumers, that their water is safe. There has to be a way of doing it. Just having a water safety plan is not necessarily going to demonstrate to consumers that their water is safe.

Now, I understand the position, and I think it's very important, because confidence in the public water supply is I believe absolutely paramount.

Q. The test of the water is in the drinking, not taking a shower?

A. No. I think in a lot of cases that's true. The taste will be very, very important, its appearance, its temperature, and so on. But you can't see

contamination.

Q. That's the problem.

A. That therefore becomes important. I think that in Hong Kong, the way that consumers have been -- I think it's not unreasonable to say let down is that the various processes that were in place, that were in place, to prevent the contamination occurring have broken down.

Q. Yes.

A. And clearly that is partly what this Inquiry is about. It's to address that.

Q. Entirely, not partly.

A. It goes a little bit beyond that.

Q. Of course the reason why we are looking into a water safety plan at all is because we are all looking into the future; right? Of course, it wasn't there in the past, so we hope they will come up with a good one, but as you said, they have not even got the people together. That's the problem.

A. I would agree that's a problem and we've had a lot of discussion this morning, or a lot of exchange this morning, about that particular issue. I have said that

there should be much closer liaison between the various departments. There's got to be much more involvement of different stakeholders. And that particularly becomes important when you reach a situation where there is a multiple involvement in the responsibility for delivering safe water, and within buildings you have multiple responsibilities. So it is really important that they get together.

That is somewhere where I think that the consumers in those affected buildings have been let down. You can't expect them to know that they have contamination in the water when you can't see it.

Q. Yes, of course. Of course the people who ought to be there, the Customer Services Branch, won't even see you?

A. It wasn't that they wouldn't see me, it was just that --

Q. It was just an accident?

A. I was seeing a number of people. I had a day and a half, basically, in total. A lot of that time was spent with the task force, the task force members, and members -- people from HD, and I couldn't see them.

I agree that if they had really wanted to, they could have asked to see me.

Q. They could even be lining up outside court to see you at 5 o'clock?

A. I hope not. I'm planning on going back.

DR WONG: Mr Chairman, we would be most happy with that.

MR LEE: Good. That's good news.

You mention rightly that our licensed plumbers' status is not perhaps as good as it should be?

A. That is my perception and my concern.

Q. Do you know how long it would take to train one of them to be licensed?

A. I think it's about -- it's months rather than years, and that is not unreasonable.

Q. So I don't think, therefore, it is reasonable, at least for our purposes as to who should be responsible for the quality of the drinking water, and so on, to look at them as if they were professional people, like doctors, engineers, architects or lawyers, in the context of Hong Kong?

CHAIRMAN: I'm do sorry, what's your question?

MR LEE: It won't be right to look at the status of these licensed plumbers and put them in the same status as other professionals?

CHAIRMAN: Why not?

MR LEE: If they were trained in a few months.

CHAIRMAN: No, no. We know as a matter of fact that they now have to go through a three-year craft certificate.

A. Yes, before they can --

CHAIRMAN: Before they practise, for another four years -- no, incorrect. They can actually then go on to take another course, to qualify themselves as a licensed plumber.

So we are not talking about months. We are talking about years, actually.

MR LEE: What about the older plumbers?

CHAIRMAN: For the older ones, there's no formal qualification at all.

MR LEE: And some of them are grandfathers.

CHAIRMAN: Yes.

MR LEE: Do you know that they have no -- at least some of

them can't even decide what materials could be bought? Sometimes, they are bought for them?

CHAIRMAN: If you believe them.

MR LEE: Yes, if you believe them.

A. Well, that is -- within what we have talked about and what we know about the role of a licensed plumber, that doesn't fit very well with their roles.

But that isn't something that then becomes their responsibility. It means that others are not fulfilling their responsibilities properly.

Q. Okay.

CHAIRMAN: Can I ask you, Professor -- because you talk about skeleton WSD WSP. What exactly, because I have read those WSPs myself too -- well, on the face of those documents, it seems they are quite sort of comprehensive to me.

A. The detail is very limited.

CHAIRMAN: Right.

A. It's like so many things, the devil is in the detail, and one of the things -- you cannot put into a single plan -- almost invariably, these things are living

documents, so you've got a framework, you've got the skeleton that you can hang everything else on. That's very important.

The skeleton is interesting, but the detail, as I have said in places in my statement, is not so obvious. How they operate the distribution system is not so clear from this, because that would involve a level of detail, explaining what processes are there to deal with planning out, have they got GIS maps of the distribution system, how do they operate valves, do they have records of whether valves are closed or open, all of these things. And you can't put everything onto the skeleton. The skeleton has a lot of flesh that's attached to it, and that's important.

I haven't had -- it's impossible in the time frame to walk through the details of the water safety plan. When I was helping Northern Ireland to do their water safety plans, there were two of us working with them, and we were involved for six months, more than six months.

So it requires a lot of the detail, and the detail

in the different treatment works, the different catchments, and so on, means that there's a lot of detail in there.

Now, I know that there is a lot more detail in different places, but you don't put them all in the one plan. The danger is always that if, as happens with some, where the consultant has prepared the water safety plan for the water supplier, and it comes as a volume, and it goes on to the managers, often the chief executive's shelf so he can show it off and nobody looks at it, and that is not what a water safety plan is about. A lot of the water suppliers in the UK, fortunately, have computer systems. You've got the different steps and different plans. You have operating procedures. All of those are part of the water safety plan.

MR LEE: Professor, you just mentioned about your experience in Ireland, both you and your colleague, and it took six months. But did you have all the stakeholders together, working with you?

A. We had not all of them at that stage. We hadn't been through all of them. We had been through a number of

the stakeholders. And the water supplier -- it's a publicly owned water supplier -- was still trying to get to grips with the part of the plan that was going to look at buildings, because there were a lot of different stakeholders that needed to be involved. They knew some of the things and they had had dealings with their public -- the consumer department, who wanted to be trained. They were trained in what a water safety plan was about, so they knew about that. But they knew that a water safety plan would not be in the same form as the water safety plan for the treatment works and the distribution system. It's going to have various bits.

But the plan would involve a lot of different stakeholders, and those stakeholders will vary, according to the circumstances that you are in. The level of detail in the plan will depend on whether you can access buildings, what sort of regulations are in place to support that.

In Hong Kong, you have a number of those steps for the water safety plan. The piece that's been missing is

that implementation, the level of that implementation. It should have been very straightforward but, like in so many things, when nothing has happened -- I'm reading a book at the moment where they say, "We had a hurricane in 1910 but we never have hurricanes here", and that sort of reasoning, "It hasn't happened for ages so why would it happen again?" -- that sort of thinking is something that creeps in. It's not something that's a conscious thought. It's an unconscious thought, and it involves everybody.

Q. The hurricane is an act of God?

A. No, I think it's an act of physical and meteorological conditions.

Q. People abusing the earth?

A. I don't think so. Hurricanes have been around for a rather long time.

Q. More so than before, I suppose?

A. There's some doubt about that.

Q. I don't want to enter into an argument with you, because you know about all these things; I don't.

But tell me this. So who should take the initiating step to get people together, so they can begin to look at all these things with a view to coming up with a good water safety plan?

A. My feeling is that it should be the WSD?

Q. The WSD?

A. Because they already know about water safety plans. So I would say that it is incumbent upon them to pull together the various groups.

Q. And the first one, who should be ready and nearby would be the Housing people, because it's in another government department?

A. Yes.

Q. And it's the owner of so many public housing blocks, housing more than 2 million people; do you know that?

A. Yes, I knew that.

Q. Of course, when you come to individual owners of flats, there may be more problems, but there's nothing to stop them from getting on first with this one; right?

A. I've been saying this over the last two days: there is a

need for a building management manual, and that -- where you would start with a building management manual is with the public housing blocks, because the Housing Department is effectively the landlord, and it is therefore simpler to deal with that because you have fewer stakeholders, and you can use that as a basis for others.

That should have happened. But again, that's 20/20 hindsight. The reason that it will happen now is because there is now an increased sense of urgency because it is now understood within Hong Kong that there is this need, whereas it was not understood that there was a need for it because there were systems in place.

Q. Yes.

A. And it was assumed that those systems that were in place would actually deal with the problem.

Q. And of course, looking back with hindsight, if there had been a water safety plan and people had been looking at it and following it, so warning themselves of the possibility of this sort of thing happening, do you think this could have been prevented?

A. I think it would have been considerably less likely, because it focused the mind. I'm not going to say that it couldn't possibly happen. You can't ever say that something will always be prevented, because it depends what goes wrong. But the process would have been highlighted, that a proper water safety plan of that type means you are taking it seriously; you have checks in there, you have processes that are about making sure what you have in place works. And we talked about verification.

Q. Yes.

A. Verification that the system is working properly and the barriers are there.

Q. And taking water samples?

A. Not necessarily. Not necessarily. The illustration that I made earlier, for your colleague, was about a well and you have animals accessing the well. That's a danger, that's a hazard, and so you fence it off and you check that the gate is closed, et cetera. So it can be inspections, it can be making sure that certain things have been done. It isn't necessarily all about

water samples.

And water safety --

Q. You don't exclude it, though, do you?

A. I don't exclude it but Water Safety Plans is not always about water samples. In fact, water safety plans is helping to get away from the thinking that is we take samples at the end of pipes, because the problem with that sort of thinking is that you start to rely on a very few samples to check whether something is there.

Now, this is not entirely desirable. You should be preventing -- it's after the event. The whole point about a water safety plan, it's not supposed to be checking things entirely after the -- this is a last resort. So the water sampling really is a final, last-resort check. You should have picked that up before that point.

Q. Like what? By doing what?

A. By making sure that the various procedures that you are supposed to be following are actually being followed; that the correct solders are being provided; that the plumbers and the engineers, everybody, understands why that's happening, and so on. So there's a lot of steps

before the water sampling.

As it turns out, I'm not convinced that the sampling method would have helped particularly, except that there were a number that came out above the then considered WHO guideline value.

So you should be preventing that. The problem with finding out after the event is it's too late.

Q. In other words, other stakeholders could have known about this, are you saying?

A. Oh yes. I think there's a number of stakeholders involved, and the problem was that, to an extent -- and I said this yesterday -- it sort of fell between the cracks.

Q. Again, for instance, if people were to go to the site, the building site, and actually examine the materials, solder, test it, see whether it contains lead or not -- now, if they do that, again they can only take samples, in a way? You can't be there all the time?

A. No, but you can take a series of steps that will emphasise that certain things should be used and that certain things are there. The proposal, for example,

now is that there perhaps should be central purchasing of items like solder. That means you have a store of them there. It's much more difficult to use the wrong material.

The training side is very important.

Q. It's more expensive than the solder with lead?

A. It is more expensive. That's the problem we have had in the UK, that it's more expensive. The DIY plumbers go in and buy the cheapest and it's not the right way to do it. You have to work hard to make sure they use the correct materials and the level of training and supervision has to go all the way down to the people actually doing the soldering itself.

Q. So are you suggesting then, Professor, that if all the stakeholders were to be involved in this, under, for instance, a proper water safety plan, and they all did their job, as it were --

A. Yes.

Q. -- then this sort of thing ought not to have happened?

A. I would argue it ought not to have happened anyway, but

yes, I would agree with that.

Q. I'm interested, why do you say "anyway"?

A. The procedures, the requirements were in place, and they should have been followed, and if they had been followed, this would not have happened.

Q. Yes. If the presumption is that people would do what is expected of them all the time, then I suppose a lot of civil servants would just be complacent and assume, therefore nothing would happen?

A. It's not just civil servants. I think this is --

Q. Fair enough; including you and me too.

A. It is a fact of life. People tend to be like that, and unfortunately, unless you have a very clear understanding of why you are doing things, then people tend to forget how important small things are.

Q. But the trouble is, as you put it -- I mean, assuming here we have very good document, or maybe a series of good documents, and if people don't read it and don't talk about and discuss it, then it's still no use?

A. That's correct, but then it's not a water safety plan

anymore. A water safety plan has got procedures and requirements, and you have to have checks in that those procedures are being followed.

Q. And meetings?

A. Well, meetings will be in there. There will be a whole range of different things.

But it's not just a document. If nobody is reading it, it ain't a water safety plan.

Q. It requires good plan and a lot of people who always warn themselves that anything can happen and therefore you must be prepared?

A. Yes. That's what we try -- one of the things we try and teach is to ask outrageous questions, "what if", and sometimes we ask outrageous questions and the answer we get is silence and then panic.

Q. And of course you ought to make sure there's a culture among these people, all these stakeholders, that whatever can go wrong will go wrong?

A. Yes, and that's why you try and prevent it. That is -- one of the points about water safety plan, or water safety planning as a principle is there is a significant

culture change within that, and it does direct the culture.

Q. That is the most difficult part, isn't it?

A. It is, and it takes time. It obviously takes time.

Q. This expression -- I got it from my learned friend Mr Ho -- when you ask people to fix their eyes on the ball, and if -- you should fix your eyes on the ball, even though it is put there at the corner, before it is kicked, you should place your eye on the ball, not when the ball comes near to you, and that's the difficulty?

A. As a keen watcher of football, I can tell you that people take their eyes off the ball even when it is very close!

Q. That's what I told my son, when you want to head the ball, you must watch the ball all the time.

A. Absolutely, and it's the same with everything else. With water, if you become complacent and start cutting corners, that's when things go horribly wrong, and there are lots and lots of examples that I'm not going to give you here because we haven't got time.

Q. You are in a hurry to go home tomorrow?

A. I have to go home tomorrow evening, but it's quite late.

Q. Don't worry.

A. It's delightful sitting here in the room, but --

Q. Don't make it more delightful for me, otherwise I may change my mind!

Occasionally, when you have a particle with lead in it, which gets into the water, and then it's tested, and then you see some abnormal rise; right? I mean, you have seen this chart; I won't show this again to you. Should the sample be discarded?

A. No. It is a signal that something is wrong. You may want to go and re-take a sample. You may want to re-examine. But it shouldn't be just discarded.

I was trying to pick that up before, and one of the key mantras that I certainly have and I try and bring to water suppliers is, if you are taking samples and you are going to disregard the results, what's the point of taking samples.

Q. Exactly.

A. So you need to consider it.

Q. If you are working for the Waterworks Department, then

you don't like the sample, that doesn't mean you can just --

A. That's one reason I suggested that having a water quality manager would be a benefit, because it takes that person out from the pressures, and I know that there are significant pressures on the operational people. Running a water supply of any size is not an easy thing to do, and it requires a great deal of skill and dedication. So there will be pressures, and having somebody who's outside that, who will say, "I don't care whether you think that is a problem with the laboratory, we are not going to ignore it, we are going to check it out, we are going to do something about it."

Q. So you want an independent person to do it?

A. Yes. It's helpful, within the organisation, not an external regulator, but somebody within the organisation who doesn't have the same operational pressures.

Q. Okay. Is there any way to find out where a particle of that type might have come from? Can you use this

method, isotopic method, to find out?

A. No, it's very difficult. It will tell you that it could have come from originally the lead, if we are looking at lead. It could tell you that the lead has probably originated from solder, but you would need to have enough of a sample, and a single particle is going to be too small an amount.

With particles, particles are quite a common phenomenon with regard to lead in water, and they create a certain amount of concern, particularly amongst consumers. But it's the average exposure over a period. So the original provisional tolerable weekly intake -- and I know that we don't have a health-based standard anymore -- but the idea was that instead of having a tolerable daily intake, the provisional tolerable weekly intake actually indicated more clearly that it was exposure -- it would even out over a period. It's not the peaks like that (demonstrating), it's the average exposure over a period of time that becomes important.

So, in terms of particles, if you are picking those up, then in exposure terms it's still going to be the average over time. So it's not something that necessarily requires that you should be any more concerned about, but it does require that the water -- whoever is responsible for that plumbing system is aware of the presence of those particles, and the approach that you take to ameliorating the problem, that should be taken into account when you are doing that.

Q. I take it that there is no longer, as far as the WHO is concerned, a health-based level, is there?

A. That's correct.

Q. And the 10 micrograms per litre is a decision-based guideline -- I think yesterday you said that, or an intervention action level?

A. Yes. It's a level below which you are trying to achieve. You should be trying to achieve to get as low as possible. 10 micrograms is what we know with extensive systems, where there's lots of lead, we know you can get down to 10 fairly readily, using a treatment with orthophosphate.

Q. And you said for Hong Kong it could be half?

A. I think for Hong Kong you ought to be aiming at a lower value, simply because you do not have that basis of considerable levels of lead, service connections, lead piping, and so on.

Q. Indeed, the water in our mains has practically no lead?

A. That's correct.

Q. Do you know how low it is?

A. It's less than a microgram. Most of the time it's below detection.

Q. Below detection. So in theory, then, if I turn on my tap and have my water tested, and if it has 2 micrograms per litre, then already there's something wrong with the internal system?

A. Not necessarily. We don't have a very good background, and that's something that needs to be looked at, as to what the contribution will be. There will be a small contribution from fittings that do meet the British Standard, because there will be some lead there.

Q. It would be very low, wouldn't it?

A. It will be very low. It may well be below detection,

but I would like to see some data. It indicates that -- certainly at 5, that would allow you to say -- it may be that Hong Kong, with the data that it can generate as a consequence of this incident, will be able to say, "We are going to set our standard at 2".

Q. That's exactly what I want you to say.

A. It's up then to Hong Kong, and they should set standards based on their particular circumstances, and if your circumstances are that you can maintain a very low concentration and it's not a problem, then you should set your standard at that lower level, because you shouldn't be allowing the water supply to deteriorate unnecessarily.

Q. And there is no reason for Hong Kong, because our water from the mains is so low as far as lead content is concerned, not really to set it low?

A. And more than that, you don't have lead service connections, you don't have unplasticised PVC pipe that's got lead stabiliser. All of these things are in place that you don't have. Therefore, you could have a very low standard.

It would have to be above detection, clearly, because sometimes you are going to find traces of lead. It's not a consideration particularly.

Q. After all, it is a standard set by the government to aspire to, really?

A. I'm not so keen on setting standards to aspire to. I'm more keen on saying that these are standards that we can achieve, and if we can achieve it, a good standard, then we should have that, and we are not going to allow the water to deteriorate, to make it worse.

Q. Okay.

A. For aspiration, the way that it's been done in a number of places is that you have a particular standard and you say, "The standard is 25 micrograms per litre now; in 10 years' time it will be 10 micrograms per litre", and that then provides a target.

It needs to be more than aspirational. There are aspirational targets for other substances in some other countries, and the trouble is that they are effectively political, and then when you get an exceedance of that particular standard, you have a problem, because the

interpretation becomes very difficult.

Q. I stand corrected on having used the word "aspired to", because Hong Kong doesn't have to aspire to 5.

A. It's already got it.

Q. It's already there. That's why, why don't we bring it down?

A. You don't have a standard. That's the point. You don't have any standards.

Q. At the moment our water people are using 10.

A. Because they work to the WHO Guidelines. My point with my report is that the guidelines are not supposed to be used that way. Therefore, it would be helpful to the Water Supplies Department, and everybody else, if you had Hong Kong standards. It wouldn't be the long list of guidelines that they have, it would be smaller than that and it would be relevant ones, but you could set the standard at what would be appropriate, and it could be 2.

Q. It could be 2?

A. For lead, it could be 2. It could be.

Q. That's the answer I wanted, because we have already got

it, actually.

A. Absolutely. I have no problem with that. It's just logical that that would be the way forward.

Q. I will move on to another point. You gave some evidence on orthophosphate dosing.

CHAIRMAN: Before you ask your next question, I think there is a problem with the LiveNote. I think they have to fix the LiveNote, so let us, say, adjourn for

a ten-minute coffee break.

MR LEE: I won't be too long.

下午3時39分聆訊押後

下午3時52分恢復聆訊

MR LEE: Mr Chairman.

Professor, I think you can fly away tonight, unless something terrible happens.

A. I'm not flying tonight. I'm flying tomorrow night. I may be frying tonight.

Q. So would you rather that I give you until tomorrow morning? I shan't be long.

Professor, you mentioned something about orthophosphate dosing.

A. Yes.

Q. You said that if you put it into water, in the mains, you don't think you could bring down the lead content to 10 micrograms per litre?

A. In a normal system that we have in the UK and elsewhere, where there are extensive lead pipes, it is difficult to get universally below 10 micrograms per litre, with dosing with orthophosphate, without removal of lead pipe.

Q. Okay, so you have to remove the lead pipe, ultimately?

A. Yes, that's the objective.

In the situation in Hong Kong -- I'm a bit nervous about proposing remedial measures -- clearly, remedial measures are in place, in that the lead is being removed and replaced. But one way, under other circumstances, if you had had a lot of old lead in the system, in a similar way, so that the lead solder or lead connections had been put in place a long time ago, one way might be to dose orthophosphate at the entry to the buildings, because once you start dosing with it, you've

got to keep on dosing.

So that would be one way to reduce lead problems.

You have an alternative, and the alternative is in many respects a lot better, because it's actually removal of the lead. Then you've just got to make sure that when there are repairs, you don't put any more back in.

Q. But using orthophosphate dosing, it could produce -- normally also produces the effect of forming, inside the pipe, an inner tube?

A. How do you mean?

Q. There's a coating. Do you know about that technique?

A. Yes. A coating? It's -- a chemical reaction takes place between the lead and the phosphate, to form lead phosphate, which is highly insoluble. When you get that layer -- as the lead is coming out, as it is dissolving in the water, it reacts with the phosphate, it forms lead phosphate, which is insoluble, and that deposits as a layer over the surface and reduces the potential for further -- it doesn't entirely stop it, but it reduces

the leaching of lead.

Q. Does it mean that you don't need to replace the pipes, because then the inner coating would protect the water from the lead?

A. That is what is used to get the lead level down to about 10 micrograms per litre. You don't replace the pipes under those circumstances, but you have to keep on dosing the orthophosphate. It's not something you dose it and then you stop, because if you stop dosing then that layer starts to break away.

Q. I see.

A. So once you start, that's it.

Q. I could be wrong, but I'm told that this sort of technique is used pretty -- a lot in Germany, for example; are you aware of that?

A. You are coming to a particular brand.

Q. I won't mention it.

A. I've had emails from the people concerned. Orthophosphate dosing is used widely across the world. It's not just Germany. This is not a German invention. It has been used very widely, it is very commonly used

and it is well-established.

Q. So it's used in the States, and in England too?

A. Yes, extensively, and in Scotland, Wales, all of these places. It's used in different parts of Europe where they have lead problems. So it is a well-established technique.

Q. Thank you. I haven't mentioned the brand name. You haven't either.

A. No. I did have an email from them.

Q. Me too!

Now I'm going to ask you some questions about BS EN. Could you please tell us what EN -- European norms, is it?

A. Yes.

Q. How is it related to BS standards?

A. There are a whole range of standards organisations, and there's a certain amount of co-ordination between those standards organisations, so some will adopt other standards.

My suggestion for Hong Kong is that they don't completely restrict themselves to the British Standards; that they accept materials of equivalent standards,

equivalent approvals. So that would provide a little bit of flexibility.

So there are a range of different standards, different approval schemes, that in many respects are very similar, and to an extent they are interchangeable. There may be details of difference. In Europe, we have current discussions going on in developing a European-wide materials testing and acceptance scheme. That has never happened, which is rather odd, in a market -- what's supposed to be a market like that. The stumbling point has been, for a number of years, details in the different schemes that are available. There are four main schemes, four main countries.

Q. The four member states, you are talking about?

A. There's four of the member states have very good systems, and there's equivalence between them. So all of these, and with the different standards -- there could be a whole range of equivalent standards.

Q. You see, in the laws of Hong Kong, the British Standards are adopted.

A. I know.

Q. But sometimes we get BS EN and then a number, sometimes just BS and a number. What is the difference between these?

A. There isn't much difference between them.

Q. No difference?

A. I'm not familiar with the detail of the difference between them. I don't get involved in that, if I can avoid it.

Q. But the four MS is Great Britain, France, Germany and the Netherlands?

A. Yes.

Q. And what's happening?

A. There was a meeting --

Q. I know you were involved.

A. Yes. There was a meeting held in May of last year, a two-day meeting -- there have been various attempts to get this adopted by the European Commission -- there was a two-day meeting at which I gave the keynote lecture and then chaired the second day and gave a summary at the end. The Commission have agreed, under a certain

amount of pressure, to start talking about it again, which I'm rather disappointed about and so are the member states.

In the meantime, those four members states have been negotiating and have come up with what is basically a common approach between them. That common approach, it is anticipated, would form the basis of the European acceptance scheme.

Q. So the four member states, as far as they are concerned, they have agreed already?

A. Yes.

Q. I'm asking you this because, you know, there are various groups of people working with us, and they like this. It's a forward step, isn't it?

A. That's the idea, that it will become formalised. At the moment, it is informal between the four.

I've got to be a little bit careful here -- I have been publicly very critical of the Commission for not doing it. It is because -- funnily enough, you should be familiar with that here -- one department wants the responsibility, but won't do anything; the other

department wants to do something but doesn't have the responsibility, and the consequence is that we have stalemate, or have had. It would be of benefit for Hong Kong if that happened, because I think it would be much more widely adopted around the world, and it provides an opportunity for much more flexibility in where you can source materials, and so on, from.

Q. So, since this saga has woken people up, and I think -- I understand your evidence is this is a good opportunity, therefore, for us to get together?

A. Absolutely.

Q. And to go forward from here?

A. This has got to be the best opportunity that you could have. Everybody's awake, everybody is aware, and it will be a case of putting aside departmental differences, trying to keep the politicians out.

Q. What about lawyers?

A. And deliver something that's really constructive and based on good sound practice and good sound science.

Q. You will keep the lawyers? We certainly need one judge.

A. The judges are first rate. The lawyers can be a little

dodgy!

Q. We want one judge. We don't want the Court of Appeal! Okay.

What about legislation? You are familiar with the legal framework in Hong Kong?

A. Yes.

Q. And it's pretty old-fashioned stuff --

A. Indeed.

Q. -- and it needs a lot of updating, do you think?

A. I think that's exactly right and I've made some recommendations in that respect. I think there needs to be much clearer delineation of the responsibilities of the different departments. I've said time and time again, I think there should be standards and a regulator. I'm a great believer in an independent regulator, and WHO are very keen -- and we mention it in many places within the guidelines -- that an independent regulator and standards that are tailored to the particular country are a beneficial way of going forward.

An independent regulator, because that removes a lot of the potential pressures.

And for standards, because you have to think about them, and thinking about things is really a very important exercise. Understanding which of the contaminants, apart from microbiology -- the pathogens are always important -- but amongst the chemicals, understanding which ones are really important, which ones need to be monitored at what rate, how you monitor them, how regularly you monitor them, how often you have to do checks.

We have introduced risk-based monitoring in Europe now. We modified annex 2 of the Directive. That allows member states who introduce water safety plans -- that gives them a basis, because they have hazard assessment and risk assessment, to be able to say, "We have got a supply here, we've got two or three contaminants here that are in the Directive but which we don't see at anywhere near the standard levels; we don't need to monitor these as regularly as laid down in the Directive." So they can justify infrequent monitoring.

That focuses the resources on the things that are

important. The advantage of focusing resources on things that are important is that you don't get lots and lots and lots of zeros. When you get masses of zeros, it's easy to lose what's important in that. And it gets away from a practice which is unfortunately very common in many parts of the world, partly introduced by some of the analytical results recording systems, where it only reports a result, flags it up, when there's a failure, and I can't see the point of doing monitoring only to measure failure. You should be using all of the data. There's a huge investment, and using all of that data and understanding the trends, et cetera, is an important part of the process.

This is an opportunity for Hong Kong. You've come to a point where this can be introduced into the regulation, improving the regulation, looking to the future, and the future is going to get tougher and tougher for everybody in terms of water and water supply and water resources, et cetera. Populations are going up. Resources need to be conserved. So we need to be

much more focused. And this is a real opportunity, I think, for Hong Kong to look to the future, put in place a legislative and regulatory framework that will help them to be able to focus on the important things and deliver first-class water.

Q. Does it help to have water safety legislation? A lot of countries have it.

A. I think that's really important. I think that's really important. How complex that legislation is I think is something to be discussed. I'm in favour of as simple as possible. That's a good thing.

Q. Which model is simple and good?

A. That's a very big question.

Q. No, a very short question.

A. I'm not quite sure what I would recommend. I wouldn't necessarily recommend going down the route that we've gone in the UK. I think that's very complex, and there's reasons for it.

I think that Hong Kong is well capable of looking at its own requirements, what it needs, and developing its

own regulations, and regulatory framework and legislative framework to go with that.

Q. Am I right that the sort of problem that you have been looking into also takes place in drinking water coming from hot water dispensers, so people can turn on the -- a huge tank of hot water, in some Chinese restaurants, that sort of thing?

A. Well, there can be issues. It therefore needs to be considered under regulation. But any water dispenser needs to be considered appropriately.

In fact, we do mention this in the guidelines, in chapter 6, that there are a whole range of things. We don't cover everything, because the hot water dispensers are something that tends to be uniquely associated with Chinese culture. But there are lots of other things where there are problems -- there are places where the water is delivered in tankers, in streets, and so on, and all of that needs to be considered.

I think in Hong Kong, covering water in containers of various types, it makes sense to have some regulation, in order that that's not exploited. We've

seen that happen elsewhere, where very poor-quality water has been delivered.

I was involved in a case, actually in the UK, where a company, prior to the current regulations, were bottling a water and really not very well, and they were storing it in conditions which were inappropriate. It was very warm, and so on. And the microbiology count was equivalent to raw Thames water, and I wouldn't recommend drinking it. It may not do you any harm, but I don't think I would want to try it.

So I think any of these need to be properly regulated and thought about. There may be difficulties because sometimes you run into cultural norms that might not want to change, and so on. But it needs to be addressed, because public safety of drinking water, any form of drinking water, is important.

Q. When we talk about legislation, I suppose there ought to

be criminal sanctions for offenders?

A. Not necessarily.

Q. What about fines?

A. Could be. It just depends. It depends what suits Hong Kong. In the UK, we have criminal sanctions --

Q. But not imprisonment? I don't think it's imprisonment. Just fines, isn't it?

A. Potentially, under certain circumstances, it's possible.

It's never happened. But there is the potential for that, for a water company. If a water company boss is negligent in delivering water, they could effectively go to prison. It's unlikely to happen, partly because it certainly focuses the mind if you think that you might get that sort of sanction. But whether it's criminal or whether it's civil or whatever, I think it's whatever suits the jurisdiction that you are dealing with.

They don't have criminal sanctions in most of the European countries. It's a different regulatory system.

I don't recommend one way or another. I think it's got to be what suits Hong Kong.

Q. I'm going to ask you just a very few questions on a topic on which you have been asked a lot of questions on already, and that's water samples, taking water samples.

I have read your preliminary report as well as your own report. I think it's pretty obvious that you do not agree that first samples or overnight samples should not be taken?

A. That's right.

Q. Because, according to the WHO, the ISO 5667, it depends on the purpose of testing the water?

A. Yes. I have to say, I do get concerned that in Hong Kong everybody seems to look outside at various international standards, et cetera, when actually a little bit of thought, instead of looking at those standards, would be rather better. It's quite clear that -- you are right -- you define the purpose of the sampling, and then you design the sampling to achieve that purpose.

In the case of looking at the impact of metals -- in this case we are talking particularly metals, it doesn't have to be metals, it can be materials from plastic or whatever -- coming from the distribution system, the best way at the moment seems to be to take samples, either first draw in the morning, or the other

alternative is to take random samples. If it's a new property, then it's no problem in setting it up to take a first-draw sample that's been in contact overnight. That's not a problem. If you have lots and lots of apartments that are full of people, it becomes a lot more onerous and more difficult for all those people. So random daytime sampling may be more appropriate. And that is to identify the presence of those metals.

Q. So your opinion on this -- you are quite firm on this, first draw should be taken, for our purposes?

A. I think on the new buildings, on the new flats, that if you are sampling to see if there is -- this is your verification that lead has not been used -- then yes, I think it should be after an overnight stagnation period, then first-draw -- it depends how much you are going to take. One of the reasons that Prof Lee did what he did was because that helps to inform how big a sample would be necessary to get the information. I was a little concerned that there was a lot of discussion with him, missing the purpose of what we did. We did not do it to assess risk or anything like that.

What we wanted to do was to do some checks on the levels that had been seen, and also to help it inform the design of an appropriate sampling method for Hong Kong. And we have that, and it would imply that a 1-litre sample taken after overnight standing would fulfil the purpose in the new flats or in any new flats, as a verification.

Q. The model that Prof Lee worked on, I think, after discussing with you, was to have five samples, 0 seconds and then 20, 40 --

A. No. That's not the proposal for the overall sampling. That was the way that we did it, in order to make sure we caught the peak. That could be just by taking a full 1-litre sample. We demonstrated that the 1-litre sample would probably capture what we needed.

Q. I think the result of all this testing, and so on, will I think satisfy you that in fact it's not necessarily the first 20 seconds, from 0 to 20; more often than not, it's the next one where you find the maximum?

A. When you look at the structure, you will see that the leaded solder joints are actually further up. If you

are looking at another metal, antimony springs to mind, then you would want that very first sample, because the antimony is coming from the tap, and if you were looking at chromium, although you tend not to see chromium very much, chromium would also be coming from the chromium plating on the tap. So that would be the first -- that very short period.

That helps in terms of also looking at how people use it. Asking somebody to turn the tap on for 5 or 10 seconds makes life a lot easier than asking them to flush it for five minutes.

Q. Even two minutes is a long time.

A. Yes. I did this at home the other day, and two minutes -- and when you are standing waiting for it, it seems a lot longer as well. My fear about the flushing -- it's dealt with, so it's not a problem. If it was a long-term solution, my concern would be that people would start to revert to taking first-draw water because it's inconvenient.

Q. Now that you've got experience of the results of the five samples, in fact do you agree that if there were

two -- just take the first two -- then I think a lot of lead would have gone by then; right?

A. Well, if you flush it for any length of time, and you are pulling through the water that's in the down pipe, then because the contact time between that water and the lead is so short, you would not expect to see significant concentrations of lead.

Q. After the first two --

A. Well, after the first two to whatever minutes. It will depend on the apartment.

Q. So I suppose you would like the Water Supplies Department from now on, if they have come up with another similar thing, then they should test first draw, they must test first draw?

A. It depends what they are going to be doing, but if they are looking for lead in the plumbing, then that would be the appropriate way forward, but they would need to think very carefully because they are looking at antimony and chromium and other things as well. But if they take first draw, it's not an unreasonable position

to be in.

Q. I will end with my last question: do you drink water from the tap?

A. Of course, and in Hong Kong.

Q. And in Hong Kong. But back home?

A. Yes, all the time.

Q. Thank you.

A. I can't afford all that bottled water you have got.

Re-examination by MR SHIEH

(All questions in English)

MR SHIEH: Just a few clarification questions. The first question is really a point of correction. Can I ask you to look at your report at paragraph 6?

A. Yes.

Q. Six lines from the top, you mention "new properties in Wales".

A. Yes.

Q. The year you stated there is 2001. It should be 2007.

A. Yes.

Q. So you would change that to 2007?

A. Yes.

Q. Next, during your questioning, and I think it permeates

the entirety of your evidence, the system in place in many other jurisdictions --

A. Regulatory?

Q. The regulatory system in place, or the background in a lot of overseas jurisdictions is that they still have leaded water pipes, and so it is impractical to replace those types wholesale?

A. That's right.

Q. So the remedial measure of using orthophosphate had to be resorted to?

A. Yes.

Q. A document was produced by Mr Chan Kin Man in the course of his evidence. Could I ask you to look at it. It's bundle C21, page 19045, tab 182.

A. Yes.

Q. It is a Journal of Water and Health; you have heard of it?

A. Yes, I am familiar with this.

Q. The authors of this article --

A. I am familiar with the authors.

Q. You are familiar with the authors? Yes.

At page 19046, over the page, the second column, it says:

"Lead pipes are considered to be the major source of lead in drinking water in the UK (although lead from other sources is possible, notably lead leaching from brass and solder containing lead) and lead pipes have been the focus of corrective action. This contrasts with the view of the WHO in their recent booklet ..." Et cetera.

That's the background. The sentence I want to direct your attention to is the next one:

"Whilst the removal of all lead pipes is the ultimate goal, the very high cost (about [GPB]10 billion in the UK), problems with split ownership, likely long time scales ... prompted a national strategy for corrective action by water treatment measures as the logical first step to take."

Does that really reflect or encapsulate the message that you have been --

A. Yes, absolutely, and it's a very similar situation in the United States.

Q. Thank you. Then I have a series of questions which we would like to seek your clarification on. It arises -- the series of questions arises out of answers you have given this morning.

Could I ask you to look at the transcript for this morning, [draft] pages 54 to 55, so just scroll back up.

A. I'm still on the paper.

CHAIRMAN: He can't see.

MR SHIEH: You have it?

At the bottom of [draft] page 54, there's an answer at line 18 -- well, it starts at [draft] line 10, where I think it was Mr Ho asked you:

"But then the question is, first, why was this not done before the incident came to surface; or, if it wasn't done, should it have been done before 2015 ...", et cetera.

Do you see that series of questions? Then you mention, "It is very easy to use 20/20 hindsight".

Have you found it?

CHAIRMAN: He can't see.

MR SHIEH: You cannot see? You mean it has disconnected?

[Draft] Pages 54 to 55.

[Draft] Page 54, at the bottom, around about near line number 10, you can see the question:

"But then the question is, first, why was this not done ..."

Can you see that question?

A. Yes.

Q. "But then the question is, first, why was this not done before the incident came to surface; or, if it wasn't done, should it have been done before 2015 ...", et cetera.

Then the answer you gave was:

"It's very easy to use 20/20 hindsight --

Question: Absolutely.

Answer: -- and say that this should have happened.

In discussion between both HD and WSD, it was clear that they believed that the procedures that they had put in place to prevent the use of lead were working efficiently, therefore suggesting that there would be additional and quite complicated steps at that time, without having the knowledge of what's happened since,

I think would have been showing a level of foresight that might be regarded as quite spectacularly good.

Question: Sorry, you say, if one were to require, I say WSD first, to actually have that degree of foresight, in fact you say it's spectacular?

Answer: Barriers have been put in place to prevent the use of lead, and to suggest that WSD should have recognised the fact that there was a good chance that Housing Department would not enforce the conditions or were not able to enforce the conditions of the contract is asking a lot, I would say.

Since it has happened, clearly there are circumstances that both departments have been -- feel that they have been caught out and let down. There were other parties who clearly did not fulfil their part in the process. So I think at that time it would have been unreasonable to expect that they would have then gone and checked. It would have been, to an extent, saying that another department is incompetent and therefore we are going to double-check on them, and that's not easy to do."

You see that series of questions and answers?

A. And that garbled response from me, yes.

Q. We get the feel of what you were saying. When you refer to, "Barriers have been put in place to prevent the use of lead", I take it you are referring to at least the legal, the contractual requirement?

A. Yes.

Q. Both in the Housing Authority context and the building context. In the water context, we have the Waterworks Regulations requiring adherence to British Standards; so these are the barriers you refer to, right?

A. Absolutely.

Q. When you say they have been let down, or "there were other parties who clearly did not fulfil their part in the process", you are referring to people like licensed plumbers who you suggest the primary responsibility should fall?

A. Yes.

Q. I suppose you would also include people like plumbing contractors --

A. Yes.

Q. -- to a lesser extent, although they are labourers and you would count mostly the licensed plumber?

A. That's right.

Q. The Commission obviously does not set out to condemn or criticise for the sake of criticising. The Commission has wide-ranging terms of reference. We are both forward-looking and at the same time backward-looking. We know factually probably what happened. In terms of attributing blame, not that blame must be attributed, and this is something that we seek your assistance. Reasonableness would be an objective test. The Commissioners will obviously take their own view. You mention it would be unreasonable to expect them to have gone and checked, because it would be really for one department to say, "I don't trust that your department have done your job"?

A. The checking we were talking about was actually doing water sampling.

Q. I see.

A. So, at that time, the water -- the WSD and to an extent HD had put in place reasonable barriers, as you would

under water safety plans, put in those barriers and if those barriers operated, you simply wouldn't have a problem.

So doing verification monitoring at the tap would be an additional step which, at that stage, they might not reasonably have expected was necessary.

Q. I see. So when you say -- that is the point I wish to seek your clarification on, because when you say "it would have been unreasonable to expect that they would have then gone and checked", the "gone and checked" --

A. Was taking water samples.

Q. You mean taking sampling at the ultimate stop?

A. Yes. At that time, they had put in place appropriate barriers, and they could -- if those barriers were working and the checks that were supposed to be in place with plumbers showing which materials they were going to use, et cetera, et cetera, if that had been followed through, then there would have been no need for further verification monitoring by taking water samples.

Q. So, in a way, I don't want to put words into your

mouth -- not that you are likely to have words put into your mouth -- but if any fault is to be attributed, you would not regard the lack of testing at the tap as the ultimate point --

A. No.

Q. -- the something that you would regard as unreasonable?

A. I think to say that that was to blame is unreasonable, because the whole process is designed or should be designed to prevent this occurring in the first place. If you find it at the tap, it's too late; you have a problem.

Q. Whether any omission at an earlier point in time to do any checking is blameworthy is another matter?

A. That's totally separate.

Q. You have expressed your views and can I just -- I won't read it out in detail again, but can I ask you to look, for example, at your paragraph 47. I won't use the word "blame" but deserving of comment, let me put it in a neutral way. Whether one would elevate it to a question of blame would obviously be a matter of submissions to the Commission.

In terms of comment on various omissions at various stages, your paragraph 47 and 48 respectively commented from the perspective of WSD and also the Housing Authority. Your paragraph 47 commented on -- for example, two-thirds down the paragraph, there's a sentence about "none of the responsible parties carried out the basic checks". These are all commenting on the stage prior to the final testing of the tap which didn't take place?

A. Absolutely.

Q. These are checks which could, arguably should, have been done, let's say by licensed plumbers or at the contractual stage by Housing people, et cetera. I won't go through them in detail.

A. Yes.

Q. That's correct, right? At paragraphs 47 and 48, you are commenting on various chances before the final stage of connecting the pipes?

A. There are whole stages of opportunities to prevent what happened.

Q. Thank you. I have got that clear now.

It then leads to paragraph 66. Again, a comment on missed opportunity, "the clearly stated requirement that only unleaded solder must be used should have raised questions", et cetera. Again, that is a comment you make about missed opportunity?

A. Absolutely.

Q. There is one point -- it may not be a big point -- on which I would like to seek your clarification. It has been raised by others, WSD's responsibility for water quality ending at the point at which water enters the building.

Now, whether or not in future there should be some kind of a mandatory scheme or system, as a safety valve, to check the tap upon completion of a building, or even routine checks at taps after tenants have moved in is a matter for debate.

A. Yes.

Q. But at the moment, in Hong Kong, there are constraints, because the current statutory regime doesn't actually allow the Water Supplies Department to randomly say to a tenant, "Can I come in and test your tap?"

A. Yes. It's purely a voluntary system.

Q. That is the difference between Hong Kong and some other systems that you have seen?

A. Yes. It varies. There are similarities. There are countries in Europe who don't have the same right of access.

Q. Some systems do legislate for --

A. Oh, yes.

Q. -- coercive entry?

A. I wouldn't use the word "coercive" but they have a right of entry to take samples.

Q. Right of entry for the purpose of testing, yes.

A. It doesn't mean that they can turn around and say, "You need to be in when we call". Far from it. It's arranged. But there are other countries, France for example, where socially it is not very acceptable, and so that will not happen.

Q. But all you need, if the will is there to provide for or to introduce a scheme whereby the authorities could have a right to enter for the purpose of testing would simply

be some legislative amendment?

A. That's correct, and that can be put in various ways so that it's not seen as particularly coercive.

Q. Thank you. Let me just check.

One last point. Paragraph 47. I think it's a point that Mr Ho raised with you. There is a sentence which says:

"If staff in the HA are unaware or unsure why a contractual requirement is included then this should be rectified before the contract is let."

A. Yes.

Q. By "rectified", I think -- what do you mean by "rectified"?

A. I mean they should understand why and they should go out of their way to find out why.

Q. The reason they need to know why before the contract is let -- well, to let the contract simply means to conclude a contract, to grant a contract to a particular contractor?

A. Absolutely.

Q. The reason is because if you don't know the rationale behind a clause, you can't actually design schemes to

monitor compliance with that particular clause, to prioritise monitoring?

A. That's right, and you are not in a position to be able to ensure that the contractor himself, itself, has in place the appropriate steps.

MR SHIEH: Thank you very much, Prof Fawell. I have no more questions for you. You can relax and sit back and return home. As an avid football watcher, I wish your team good luck, except for 2 April this year.

WITNESS: I realise that.

CHAIRMAN: Prof Fawell, on behalf of the people of Hong Kong, may I express our sincere thanks to you for your assistance in this Inquiry, both in terms of preparation of the two reports and also in testifying in these proceedings.

With the co-operation of our politicians, hopefully on your next visit to Hong Kong you can see some of your recommendations being adopted and implemented here, and that we have better and safer drinking water.

Thank you very much.

WITNESS: Thank you very much indeed.

CHAIRMAN: Do you wish to say something, Mr Lee?

No. He is no longer a politician; he becomes a dodgy lawyer!

Thank you.

石先生：主席，就有少少嘢想匯報，就係聽日就我哋係--水務署方面通知咗我哋，佢哋係會傳召佢哋嘅一位專家證人簡國樑先生。咁就完成咗簡先生嘅證供之後，水務署就係唔會傳召另外一位證人，雖然另外一位專家證人係入咗一份初步嘅報告。跟住我哋係會回歸到水務署嘅一啲事實證人，咁就我哋嗰個表遲啲我哋會即係正式出嘅，但係就先後次序，就遲啲會編排，但係就係會包括黃仲良先生、梁永廉先生，即係之前原先諗住 plan 好會傳召嘅水務署嘅事實證人，就係會隨住簡先生專家證人之後就會傳召。

主席：咁...

石先生：應該係星期一傳召嘅。

主席：咁樣聽日你哋想九點半抑或十點，請問？

王先生：睇下石大律師需要問幾耐。

石先生：唔會好耐。

王先生：咁樣開十點吖。

李柱銘先生：如果係上晝完得嘅，就我自己九點半。

主席：係，咁我哋聽日九點半先喇。咁就下個星期一就我哋十一點鐘先至開，因為有啲 personal engagement。咁聽朝早，嗄。

2016年02月18日

下午4時40分聆訊押後

Thursday, 18 February 2016

(9.32 am)

PROF JOHN FAWELL (on former affirmation)

Cross-examination by DR WONG (continued)

(All questions and answers in English)

DR WONG: Good morning, Prof Fawell.

The topic that I would like to explore with you next is your suggestion to add three more chemicals for testing in the water sampling.

A. Yes.

Q. Let me make it clear first, the stance of the WSD is that they are very welcome to considering any additional chemical to be tested. So it's not that we are resistant to any suggestions. They are suggestions only. Just so there is no misunderstanding on that.

We would just like to understand the rationale, the basis for inclusion of the three additional metals. First, you suggest the inclusion of zinc.

A. Yes.

Q. If we look at your paragraph 69 in your report.

A. Yes.

Q. There you say that zinc is unlikely to be present unless

galvanised pipes are present.

A. That's correct. Usually zinc comes from galvanised pipe. I know that galvanised pipe was used in the past in Hong Kong.

Q. In Hong Kong. So in terms of risk assessment, since Hong Kong has not used galvanised pipe for quite some time, in terms of assessing risk for inclusion of another heavy metal into the sampling, testing, what is your thinking behind the inclusion of zinc?

A. My thinking is that because the galvanised pipes were used in the past, that an investigation, in other words, for a short while, as samples are being taken, then to look and see if zinc is present. If zinc isn't present in significant concentrations, then it can be dropped. But then the WSD have got the information and they are not surmising that zinc may or may not be present; they actually have facts that allow them to say, "We have looked and we can show that it's only present in very, very low concentrations, it's not a problem" and they can always check also -- well, they are checking -- with the raw water, I hope.

Q. Yes, perhaps out of an abundance of caution?

A. Yes.

Q. Talking about data, you know that Prof Joseph Lee has conducted a rather detailed research.

A. Yes.

Q. One of the parameters that he finds is about the level of copper --

A. Yes.

Q. You know the figures; right? It's at page 173.13 onwards. If you want to have a look, V1/173.13.

There is nickel, copper, lead, et cetera; right?

A. Yes.

Q. As far as lead is concerned, I don't think we have any disagreement here that lead is health-based; right? That level is health-based; right?

A. Yes.

CHAIRMAN: The level is?

DR WONG: Health-based, the guideline value for copper is health-based; right.

Prof Lee has done a rather detailed analysis by way of his sampling protocol.

A. Right.

Q. And the level of copper found is less than --

A. It's very low.

Q. It's very low; right?

A. Yes, it's very low. But in the future you would be looking at other circumstances, and it may not be the same. I'm not thinking just about these housing estates, but in the future there will be new developments, new buildings. There will be private buildings, and so on. There are circumstances -- it's almost invariably when the building is new that levels of copper can, particularly if they have been standing for any length of time, actually get up close to or above the guideline value.

When that happens, it can cause some difficulties. Now, an example would be that I was dealing -- I have dealt with it in various parts of the world, but in a part of England where they have been installing new copper pipes into schools -- of course nobody is in the school over the weekend, so the pipes -- the water is standing in the pipes. It's quite aggressive water, so

it could dissolve the copper. And on a Monday morning, when the taps were turned on at the drinking fountains, at break-time for the children, there were actually very high levels of copper, enough to make them feel uncomfortable and not very well. But that flushed through very quickly.

It was a case of managing the situation for a few months, and then it settled down and there wasn't a problem.

So it's just being aware that these things can happen, because when you have potentially a new building, and if people start to report that they are not feeling very well, which sometimes happens, for a range of reasons, you have information that will tell you it's likely to be the water, it's not likely to be the water, and so on.

Q. Okay. Thank you.

Lastly, about antimony.

A. Yes.

Q. If I may invite you to go to C2/1412. That's the WHO document which you are very familiar with.

A. Yes. The WHO Guidelines. Okay. I pretty well know that one.

Q. "Antimony is used in solders as a replacement for lead ..."

A. That was a proposal at one time. That has not happened.

Q. If that has not happened, your thinking about the risks of antimony to exist in the Hong Kong drinking water system --

A. Well, it hasn't happened. We specifically did a guideline because that was a proposal and it was important to have available the information so that judgments could be made. But since then, we also know that antimony is seen at low levels in various distribution systems, presumably as a contaminant in various alloys. Certainly we see concentrations in Europe that approach 5-plus micrograms per litre.

If it's present, it would be useful for WSD to know whether or not it really is present, and so some analysis, in order to determine whether it's found in Hong Kong at the tap, would be valuable.

It's not something I'm proposing that would be added

for lots and lots of analysis. But you have the capability in the WSD, and the knowledge of the system is part of water safety plans.

Therefore, I'm suggesting that Hong Kong -- these are found elsewhere -- Hong Kong should find out what sort of levels, if any, of antimony are here.

Q. That's a very good and cautious judgment.

The last topic I would like to explore with you is that you have been referred to a Benchmarking Study of Overseas Regulations, which is at C19.6.

A. Yes.

Q. There's one paragraph in that Benchmarking Study that I would like your assistance on. That's paragraph 2.5.3 on page 14411. That's talking about the practice in England, or the UK, about the approval of new plumbing work, at page 14411, 2.5.3.

A. Yes.

Q. The system in the UK, or in England and Wales, is that whenever there is completion of new plumbing works, then -- "TW" is a water company; right?

A. That's exactly right. This is dependent on the water company. This is not a statutory scheme. The companies

would prefer to have -- they are in the position that they cannot insist on an approved plumber being used. The Water Safe scheme is fairly recent and has been promoted by the water suppliers, in the absence of any action from government, in order to, to an extent, mirror the scheme in Scotland. They have put together a scheme where there is training and a plumber can be approved.

That's slightly different to Hong Kong, because in Hong Kong you have a licensed plumber and then you have a whole series of other plumbers. And in the UK, often it's all one group.

Q. In the UK, "approved plumber is used", and then "Taps certificates provided simply needs to be sent to TW with a pressure test and chlorination certification (self-certify)."

So I want to ask you and to tap on your experience: why is it that you need a self-certification by approved plumbers, as far as new buildings are concerned?

A. It's part of the process of making sure that things

happen, but to minimise the amount of work that's involved by the water company. The water companies have fittings inspection teams, and they have to ensure that the bylaws -- this is the WRAS scheme -- are being met. That means inspecting backflow devices, the way the plumbing is put in, the materials that are used,

et cetera.

It only goes so far, because of course once you get into the house or into a property, they have limited powers in that respect. They can insist that anything that's used up to the point that it enters the property is a particular material, approved material, and they can advise within the property, and they do advise, because one of the things they don't want is water quality problems occurring because of the materials that are used, incorrect materials, and they can say to the consumer, "Sorry, it's your problem, you used the wrong material. It's between either you and your plumber or you, yourself, to fix it", and they will not be held responsible.

So if somebody did repairs in their house and used

leaded solder, the water supplier would not be responsible for that. So if they found lead in a sample of water, and the fittings inspectors have been around and said, "They have been using leaded solder", the water company can say, "This has nothing to do with the water supply or with the normal piping; we don't have any responsibility for this. We don't have to put in treatment or anything; this is a problem for the particular householder."

So it's a little bit more complex than in Hong Kong, but in the UK we don't have the same sort of big public housing set-ups that you do in Hong Kong.

Q. Sure.

A. And obviously we don't have these very high-rise buildings.

Q. Sure, sure, sure. This system would rely, would you agree, to a very large extent, on a trust on the approved plumbers to certify that? Because they have to self-certify themselves and the water company --

A. Well, they self-certify on chlorination -- the pressure test and the chlorination. But the plumber has been

certified beforehand.

Q. Yes.

A. So a certified plumber would do the various tests and then send the paperwork to the water supplier. And yes, they would rely on that certified plumber doing the right thing.

If the plumber is found not to have done the right thing, then he has two problems. One is his certification will be removed by the water supplier, and that information will go out that this is no longer a certified plumber, which will mean he's going to have difficulty getting business. And the second is that his clients that he's been working for will be in a position that they may well be able to take him to court for

breach of contract.

DR WONG: Okay. Thank you very much, Mr Fawell. I have no further questions for you.

Cross-examination by MR HO

MR HO: Professor, good morning. I represent the Housing Authority.

A. Yes.

Q. I hope what I'm going to ask you perhaps to a large extent is actually pushing some open doors, but do bear with me.

Professor, I have noticed first of all, in your reports, at different parts of your report, you have actually used terms like "Housing Authority" and "Housing Department". Now, I don't know if this is an intended distinction, because the report actually talks about roles and responsibilities of various parties. I don't know whether, in so doing, you are making a conscious distinction or whether in fact the terms are quite interchangeable?

A. They are largely interchangeable.

Q. Right.

A. When I visited, in talking to people from the Housing Department, they were using the terms "Housing Department" and "Housing Authority" reasonably interchangeably.

Q. Sorry. I just want to make sure there's nothing, difference in terms?

A. Yes. It wasn't very clear, the differentiation, and

I wonder whether in many respects there is a need for that differentiation, just how important it is.

Q. Probably not. I just want to make sure that I understand the situation.

The one aspect that I want to try and ask you to elaborate a little bit upon is the part where you talk about the concept of water safety plans.

May I direct your attention to paragraphs 35 and 36 of your report, please.

A. Yes.

Q. Towards the middle of paragraph 35, you were referring to:

"The concept of water safety plans was introduced in order to encourage a proactive preventive approach to managing risks to drinking water from the catchment to the point at which consumers receive their drinking water ..."

And you use the term "source to tap approach".

A. Absolutely.

Q. There is a helpful reference to one of the papers -- I will take you to that in a moment -- but if I may, just for the time being, go to your next paragraph. In

paragraph 36 you say water safety plans require several things. I pick up the key words here as being, one, system assessment --

A. Mm-hmm.

Q. -- from catchment to tap; two, identification of hazards.

A. Yes.

Q. Three, assessment of risk; and following, in line 5 onwards, then recommendations of supporting activities such as ensuring materials in contact with drinking water do not cause degradation of the quality of the supply. So supporting activities there.

A. Right.

Q. Do I understand that these are sorts of concepts or terms actually used in that paper, which I go back to your paragraph 35 at the end -- in fact, those are the sorts of thinking incorporated in that paper?

A. Yes.

Q. Basically, your summary -- your paragraph 36 is a summary of the things in that paper, isn't it?

A. Yes.

Q. May I take you to the paper then?

A. Right.

Q. It's in bundle A3, and chapter 4 -- page 1687, please. I don't think counsel for the Commission has actually taken you to this paper when you went through the report in some detail. So if you would bear with me --

A. Yes, that's right.

Q. -- let me try and take you through this paper.

A. Yes.

Q. Now, page 1687, that's the chapter 4, on water safety plans.

A. It is.

Q. That's your "source to tap" approach?

A. Yes.

Q. If I may ask you to look at page 1687, just the head under that chapter. Basically, the first paragraph says -- well, if I understand correctly, these water safety plans are basically risk managements?

A. Yes.

Q. Basically, it's to identify risk, identify hazards,

identify how to control these risks, control these hazards, and then have a management plan for --

A. Absolutely. You identify what the hazards are. You assess the risks that those hazards will cause problems. Then you have plans and steps in place that will either mitigate or manage the risks.

Q. Right. There seems to be, as a layman reading this paper, to be a very helpful figure at the next page, 1689.

A. Yes. Mmm ...

Q. This sort of flowchart -- really, for me, it summarises what this chapter is about.

A. Yes. It was intended to do that. You have to be careful not to be too rigid about this.

Q. No.

A. We have had some difficulties with it. You've got to remember that this is written by experts, and experts are not always the best communicators.

Q. You must be the exception, if I may say so.

But by and large, what I get from this figure, following the direction of the arrows, what you have is,

for example, you first assemble the team --

A. Yes.

Q. -- to prepare these water safety plans.

Skipping the documentation part, because it comes back right at the end and it comes back in a circle, but skipping that for the time being, then this team, in the third box, they are supposed to do a hazard assessment; identify risks, basically the risk assessment approach; characterisation of these risks.

I suppose then "characterisation" meaning, "Is the risk high or low or what?"

A. Absolutely.

Q. "Can we ignore this for the time being, due to resource considerations", all that?

A. Yes, prioritisation and so on.

Q. Prioritisation and all that.

Then, moving down to the fifth box, another bold highlight is "control measures". Having identified risk, then you identify what are the control points and how can we --

A. Absolutely.

Q. -- effectively address the risk.

A. Absolutely.

Q. In those two boxes -- I will take you to the relevant parts in a moment, because on the right-hand side you see a reference to section 4.1 and 4.2, those two references.

But if I may just move down that chart for the time being, there you have a box for monitoring, you have a box for verification. I suppose that's your control, verification, to see if the control measures are --

A. Yes. The verification is making sure that your control measures are working.

Q. That's right.

Then lower down that box you come to "supporting programmes".

A. Yes.

Q. If I may just read out also the words in brackets:

"(eg, training, hygiene practices, standard operating procedures, upgrade and improvement, research and development, et cetera)."

There is more elaboration on that in section 4.4.

I will take you to that in a moment.

A. Yes.

Q. Then "Prepare management procedures", and then "Documentation", and then coming back to the documentation in the first place.

Now, I will ask you about supporting programme in a moment, but perhaps I leave that for the time being, because first I may want to go to 4.1, first.

If you turn over the page to 1690.

A. Yes.

Q. Now, this is your -- sorry, not "your" -- but this is the hazard assessment and risk characterisation part, another part?

A. Yes.

Q. 4.1, the first paragraph says this:

"The first stage in development [the water safety plan] is to form a multidisciplinary team of experts with a thorough understanding of the drinking water system involved. Typically, such a team would include individuals involved in each stage of the supply of

drinking water, such as engineers, catchment and water

managers, water quality specialists, environmental or public health or hygienist professionals, operational staff and representatives of consumers. In most settings, the team will include members from several institutions, and there should be some independent members, such as from professional organisations or universities.

Effective management of the drinking water system requires a comprehensive understanding of the system, the range and magnitude of hazards ..."

Perhaps I will come to that in a moment. But coming back to the first paragraph, this multidisciplinary team of experts -- now, I can see that the first few categories, these of course all have their own expertise, like engineers or hygiene professionals, water quality specialists and so on?

A. Yes.

Q. These are highly specialised experts?

A. Reasonably specialised, yes.

Q. "Reasonably specialised". And the whole purpose is to actually tap on their expertise here?

A. Absolutely. It's essential.

Q. Yes, and because of that expertise, they would be able to identify where the risk is, where the hazards are, and so on?

A. Yes, and it's important that they have practical involvement, because there's no point in having a totally theoretical water safety plan. We've got that here. What they need is something which is practically delivered.

Q. Yes.

A. So they will have knowledge of the system as it is operated.

Q. Right. Now, then it brings me to the composition. Then you have an element of consumer there.

A. I think I know where you are going.

Q. Not necessarily.

A. I hope you are going down this way because I have some quite strong views on it.

Q. You do?

A. Yes.

Q. Perhaps you'd mind sharing with us?

A. I commented in the report that I was concerned about --

it wasn't clear how many external stakeholders from WSD had been involved in developing the water safety plans.

I would regard the Housing Department as one of the key stakeholders for the part -- or for knowledge of the systems within buildings, and although it's very difficult for a water supplier to produce a water safety plan for covering every single building, it's very important that there is an input, with knowledge about the types of buildings, what's in the buildings, how they are operated, how they are managed, et cetera.

Q. Yes.

A. And from what I've seen of Hong Kong -- in the UK, we would have a number of groups, but particularly the environmental health officers, who are local authority people, and they've got responsibility for the health side of the buildings. In Hong Kong, it appears to me that the Housing Department are actually very well placed to provide a focus for that particular part of the process, and it is important to be aware of what will happen within the buildings.

That doesn't mean that WSD suddenly get a massive

increase in what they've got to do, but they need to understand that part and work with those stakeholders who are responsible for the buildings.

Q. Yes. Essentially, the experts would of course then contribute to their expertise, to devise -- first of all, to identifying hazards, telling us characteristics of particular risk, high/low, something that you need to pay a lot of attention to or something that you can basically put aside for the time being.

A. Yes.

Q. And then introduce control measures. But then I agree with you to the extent that of course then you need the users' perspective, which of course injects a degree of practicality to the whole exercise. You don't want just very high-level experts --

A. No, no. It has to be much more detailed than that --

Q. On the ground?

A. -- otherwise it --

Q. Something that can be --

A. Yes, because otherwise it's not going to achieve

anything.

Q. That's where the users' contribution would be most useful?

A. It would indeed.

Q. Yes.

A. And we've operated like that in a number of countries.

Q. Yes.

A. Including ones where we don't have piped water supply actually to taps in houses, where you've got external systems, and it still works -- in fact even more important in many respects there. But there are different ways of doing it and I have made recommendations in here about building management plans, which I would see as being particularly for the public housing, but I think Hong Kong has to look and see how this would apply to private systems as well, but building management plans, as effectively the landlord, for building managers to operate.

For example, we have an issue of the potential for Legionella, and that is very important that that is managed properly.

Now, I don't know what the regulations are in Hong Kong. I haven't gone into detail in the overall regulations with regard to Legionella and other parts of buildings, other types of buildings, and air-conditioning systems.

Q. No.

A. That's normally where we look at Legionella. But we are understanding that Legionella in buildings is much more of an important issue than we had thought before.

Q. The long and short of it, the point that I want to see if you can help us, in this paragraph, about the composition of this multidisciplinary team -- they are of course people who are there to contribute their expertise?

A. Yes, they're not there just because of their status.

Q. Not just because of their status, but actually their knowledge and expertise?

A. Yes.

Q. And actually they are the best-placed people to make that contribution?

A. Yes.

Q. And there is of course the users' perspective, to ensure that when something is devised or even discussed, that is something that works on the ground and not something up in the air --

A. Absolutely.

Q. -- or theoretical, and so on?

A. Yes.

Q. So the contribution of these different people on that committee is different?

A. Yes. They are not actually going to be normally -- well, there may be people who are operating the system. It just depends how it's done. It can vary under different circumstances. It does mean that it provides an opportunity for the different groups to actually communicate.

Q. Yes.

A. And for example the current situation that we've had in Hong Kong may have been avoided if there had been that sort of communication between the different departments.

I understand it's difficult, in different set-ups, and where you've got two different departments, separate

departments, government departments, then sometimes getting those departments to be able to talk together is

difficult, and I am painfully aware of the shortfall in the United Kingdom, where sometimes our government departments will not communicate with each other.

Q. This is perhaps something I will explore with you at a later stage. But I notice you use words like "department". But anyway, this is perhaps where HD and HA may have a difference.

A. Yes.

Q. But I understand what you say.

May I move on then to the second paragraph. Basically, there it talks in terms of hazards --

A. Yes.

Q. -- as you see in the first sentence, "range and magnitude of hazards that may be present and the ability of existing processes and infrastructure to manage actual or potential risks". Then the last part of that paragraph:

"... the first step in developing a WSP is the

collection and evaluation of all available relevant information and consideration of what risks may arise during delivery of water to the consumer."

A. Yes.

Q. So again very much a focus on risk and identification of hazards.

A. Yes.

Q. Over the page, in the box, at the top -- again, the same point, isn't it?

A. It's exactly the same, yes.

Q. Risk management, hazard identification, identification of hazardous events and risk. Again, basically the same point?

A. Yes.

Q. Then the first sentence after the box:

"Assessment of the drinking water system supports subsequent steps in the WSP in which effective strategies for control of hazards are planned and implemented."

Now, of course this now goes into a little bit about

control after the identification of risk.

A. Yes.

Q. Right. But of course in this section, 4.1, if I again come back to some key points there, basically it's identification of hazards, identification of risk, assessment of that risk, and characterisation?

A. Identify the hazards and assess the risks.

Q. Assess the risks.

A. You don't need to identify the risks. If you have a hazard there, you need to understand what the risk is, and that risk could be a risk to health, it could be a risk of exceeding a drinking water standard or a guideline.

Q. Yes.

A. There are a number of things -- it could be something that will cause taste and odour or something, so that consumers would not find the water acceptable.

Q. Yes. Then characterising that risk?

A. Yes. At this stage, you would be wanting to record what barriers, what processes were there, if they were physical. So if you've got -- further up the system,

you've got water treatment in place, then that's part of

what you are recording within the system.

So when we come to buildings, you have requirements for non-return valves, et cetera. So that's part of the overall recording of the system.

When it comes to recording how things operate, diagrams of the system in buildings, that obviously becomes a lot more complex, and it actually is quite beneficial to have -- where you've got somewhere like Hong Kong, where you've got buildings that are so large, to have an idea of how those buildings operate, how the distribution system operates, et cetera.

Q. Your last point would be that somehow this body of representatives would be best positioned to actually assess that?

A. It would --

Q. To look into it?

A. There would be somebody who would have expertise who would bring that to the table.

Q. Right. May I move on to 4.2 now. This is about control

of the risk and hazards.

At page 1707.

A. When you go through this, you realise just how long these documents are.

Q. Indeed, it doesn't make it easier for anybody, administrators, to actually go through this document.

A. I will take that message back to the WHO.

Q. But the flowchart is very helpful though.

Anyway, under the box in 4.2, you have this sentence:

"The objectives of operational monitoring are for the drinking water supplier to monitor each control measure in a timely manner to enable effective system management and to ensure that health-based targets are achieved."

The point that I pick up from that paragraph -- here, it certainly put the emphasis on the drinking water supplier to monitor?

A. Yes, but this is monitoring, the operational monitoring, the barriers that have been put in place, and it's not just the water supplier, because it's recognised that it

may not be within a water supplier's control. So maybe somebody else has got to do that.

What's important is there's some co-ordination.

Q. Right.

A. That is really important.

Q. Right. I do understand the engagement of stakeholders, which you mention several times in your report. I do understand that.

But here, for example, I take it that the emphasis put on the drinking water supplier is that this is the authority or the department that should take the lead?

A. They should take the lead.

Q. Yes.

A. But it's recognised that the sorts of barriers and operational controls within buildings are not usually under the control of the supplier. So a lot of this relates to the way that the treatment works are operated, the way the distribution system is operated.

Q. Yes.

A. So you've got to be careful not to overinterpret this all the way through to the tap.

Q. Yes.

A. But the principles are still there.

Q. Yes.

I then look at 4.2.1 and 4.2.2: laying down control measures, to address the nature of hazards and magnitude of the associated risk; 4.2.1, still, in the second paragraph:

"Control measures should reflect the likelihood and consequences of loss of control."

4.2.2:

"The parameters selected for operational monitoring should reflect the effectiveness of each control measure ..."

So it's still part of that philosophy of, having identified risk, then you put in the control measures and you put in the parameters, you select your parameters to address the risk by way of these control measures, to make it effective?

A. Yes. You put in a control measure, and the operational parameter is telling you -- it's how you monitor -- the system that you've put in place, the barrier you have

put in place, is operating, and it can be a whole range of different things.

If we take a very simple example outside of a building, if we have a small supply in a developing country, and they have a well, and animals can access that well, you put a fence around it to prevent ...

So the operational monitoring is checking that the fence is operating, is there, intact, and that somebody shuts the gate all the time. It can be as simple as that. Or it can be at complex as looking at, as I mentioned yesterday, continuous monitoring of turbidity on filters in a treatment works.

Q. I presume all these operational issues, for example, like shutting a gate, the fence to a well -- this sort of thing would have been discussed in that rather high-level, multidisciplinary committee, to set up -- to address or to devise the water safety plan?

A. Yes, but it's not so high-level, because you have practical people involved.

Q. Right.

A. If you don't have practical input, then invariably it's likely to become very rarefied and not very real. The key thing about water safety plans is they've got to be real and --

Q. Practical?

A. -- they've got to deliver practical benefits.

That's an interesting one for buildings, but you have to have people who understand the buildings, to be able to devise sensible ways of doing this.

Q. At the moment, I'm still sort of discussing this in a rather abstract manner, because obviously this paper can only talk about, you know, things that are more abstract, because it's meant to be read by not just

Hong Kong people or Hong Kong circumstances --

A. This is the whole world.

Q. Yes, a much broader audience here. So at the moment I'm still sort of exploring with you the philosophy behind this.

Perhaps in a moment maybe we can get down to something more specific.

But if I may turn now to the supporting programme.

A. Yes.

Q. You see further down that flowchart --

A. Yes.

Q. -- you have a section of developing supporting programmes.

First of all, I note, in your report -- just now, when I was reading to you paragraph 36, you did use the words "supporting activity".

A. Supporting programme.

Q. In paragraph 52, at page 111 of your report -- paragraph 52, that's the head.

A. Yes.

Q. The second line, going on to the third line, you see you have also used the term:

"Supporting programmes would include systems for ensuring that only appropriate materials are used both in terms of approval and ensuring that only approved materials and chemicals that meet the appropriate quality criteria are used."

So you also use the term "supporting activity", or "programme", it doesn't really matter; it seems it's

referring to the same thing?

A. Yes. It's pretty well interchangeable.

Q. But you put the control of materials as a supporting programme?

A. Yes.

Q. If I may ask you to look at a supporting programme. Page 1721. 4.4.5 -- do you see that?

A. Yes.

Q. Now:

"Many actions are important in ensuring drinking water safety but do not directly affect drinking water quality and are therefore not control measures. These are referred to as 'supporting programmes' and should also be documented in a WSP.

Supporting programmes could involve ... "

And it is the second bullet point that perhaps is of relevance to us, the second and fourth:

"-- developing verification protocols for the use of chemicals and materials in the drinking-water supply - for instance, to ensure the use of suppliers that participate in quality assurance programmes".

Then the fourth point:

"-- training and educational programmes for personnel involved in activities that could influence drinking water safety ..."

A. Yes.

Q. You put the control of the materials as a supporting programme rather than a control measure. Is there any reason for that?

A. Well, it's one of these things that can fall into either category.

Q. But you chose support programme in two places in your report?

A. It can go in two places, but it's not actually part of the supply process.

Q. Okay.

A. So it's slightly to one side, and although in many respects it's a control measure, there is a programme involved with it. So it's not just a straightforward, "We've put a treatment step in here and we chlorinate." It's not like that. You have a whole series of steps and you have a programme that's involved in actually approving the materials, listing the approved materials,

and so on. The control measure is making sure that the appropriate chemicals and materials are used.

Q. Yes. Sorry, I interrupted you there.

A. Yes, yes.

Q. But let me see if I understand you correctly, or try and see if this really is the philosophy.

Of course, if we talk about training and educational programmes, these are support programmes -- I mean, by the very nature, training, for example if you strengthen the training of the plumbers, this is an important aspect of the support programme?

A. Yes.

Q. You make them knowledgeable about the importance of the correct use of materials, that's an important part, but it is a support programme?

A. Yes.

Q. Whether or not you elevate certain things to a control measure -- say, for example, if in the first stage, your high-level -- sorry, I keep using the word "high-level" -- your multidisciplinary committee identifies a risk, and this is a material risk, there

is

a hazard in it, then you may want to say, "Certain parts of the monitoring programme should be a control measure", but otherwise, for example, like the normal daily ensuring of correct materials are used may well be

a support programme. So you have to identify the risk first.

A. Right. You said "monitoring" -- what do you mean by

"monitoring"? Because "monitoring", it can fall into -- we use "monitoring" very loosely, and the definition of "monitoring" really relates to what you are trying to achieve. So there can be investigative monitoring, but I'm suggesting some investigative monitoring for metals in here, where they will be examined, we will look to see whether they are present, and so on. So we gain information from there.

Q. Yes.

A. There's operational monitoring, such as we've talked about making sure the gate is shut and so on. Then there can be verification monitoring.

Now, are you talking about verification --

Q. I'm talking about perhaps the process.

A. Right.

Q. You start with, say for example, material monitoring.

A. Right.

Q. You have introduced different parameters -- you have suggested additional parameters --

A. Yes.

Q. -- as means of the monitoring, then operational and verification.

A. Yes.

Q. But even the first layer, first item of monitoring, that of course is dependent on the risk assessment in the first place?

A. Yes, and clearly a risk assessment had taken place, because Hong Kong has recognised that lead was a problem, and lead solder and high lead copper alloy fittings are not permitted for use. So you have that in place. So there's a risk assessment, and the risk assessment says that this is likely to be a problem.

You then have taken steps -- you have a control

measure in place. That control measure is that you don't use these.

The Housing Department have that control measure stated in their contracts.

Q. Yes. That's right.

A. Where the problem has come has been the operational monitoring that that's actually working. I understand that can be quite complicated, but that's where it's broken down.

Q. This is where it comes back to, I think, one of your answers yesterday. You were impressed about the fact that Hong Kong has been able to put up all of these high-rise buildings.

A. Yes.

Q. I think you mentioned it a couple of times.

A. Yes.

Q. I think you did say at one stage that it takes your breath away or something like that, to that effect.

A. Yes. It is very impressive, having visited the buildings.

Q. Also I think one or two places you say this is a very

unique situation, in Hong Kong. Certainly the buildings, the putting up of these buildings, is a complicated procedure. You have lots of procedures, lots of different aspects of the construction work to look after, and so on and so forth.

Now, I don't want to rehearse everything that you said yesterday, but in essence you did say at one point, though, that perhaps people have taken their eyes off the ball?

A. Yes.

Q. That's an expression you used yesterday.

A. Yes. That's exactly the expression I used yesterday.

Q. That is where the risk assessment and then the highlighting of this -- the reiteration of this risk comes in.

A. Not quite. I understand what you are saying, but that's not quite correct, because nothing had changed, basically. Nothing had changed. So the iterative process is something has changed and therefore you go back to the beginning. Nothing had changed. Lead was still a problem, if you put it in.

Q. Yes.

A. What the failure was was at the point of the operational monitoring. So one has to say, "Okay, if we are going to fix this -- we are not actually going all the way to the beginning; we need to make sure that our operational monitoring is both practical and effective."

Q. Right, but also that of course requires somebody with his eye on the water quality rather than on the construction aspect of the project?

A. Yes, yes, absolutely.

CHAIRMAN: Well, it's not mutually exclusive.

A. No, no, it's not.

MR HO: But I think what you say -- you do say that of course people putting up these high-rise buildings --

you know, their concern or their main concern was that these buildings don't fall down. You say that, in a way --

A. I did. We had a conversation about that when I visited the buildings.

Q. In conjunction with your comment that people might then have taken their eyes off the ball, then would you say,

"In that case, these are people who are primarily concerned with functionality of a construction process, but there must be somebody who should look after another aspect, like water quality"?

A. Absolutely. There needs to be somebody who is aware of water quality.

Q. Yes.

A. The way that it's been set up, it would appear that that should fall to the licensed plumber.

Q. Yes.

A. That's the logical person.

Q. I'm coming to that, in fact. But this is the present set-up. Now, of course we can talk about how to improve on the present set-up --

A. Yes.

Q. -- but this is the set-up before the incident has come to light, and probably now is in the process -- part of the terms of this Commission is to see how to improve on

the system.

But the present set-up is that, yes, there are lots

of people engaged in the construction of these very impressive units. You have a developer, you have architects, you have building services engineers, you have main contractors, you have licensed plumbers. Now, I haven't mentioned WSD. But certainly, if somebody were to raise the awareness of this construction industry to not just look at the functionality of your building process but also pay some attention to water quality and an assurance there, WSD must have a role?

A. They certainly do. They should be the experts on water quality and they should be treated as the experts on water quality.

Q. In this, I say the process of construction, WSD cannot say, "I don't have a role there"?

A. No, they can't say that it's nothing to do with them, because they understand about water quality.

Q. They are the person who should be looking at water quality?

A. They have expertise, and they can advise.

Q. Yes.

A. So they have an advisory role. And the system in

Hong Kong is a little vague when it comes to this area, between the two sides.

Q. I will take you to that in a moment. Yes. But you do agree that certainly they have a role?

A. Yes.

Q. In raising the alarm, because they are the ones who look at water quality?

A. That's a difficult one, because as written down at the moment, they are responsible for water quality up to the point that the water goes into the building. Their expertise is such that they ought to be able to advise that there may be issues within buildings.

Q. Yes.

A. And to speak to the HD about that.

Q. Yes.

A. Now, their position might well be that there is a process in place, in terms of approved materials.

Q. I am grateful for your last answer, because you say that they have the expertise to advise.

A. Yes.

Q. Now, whether or not they did and whether or not the

present water safety plans do take care of that, that's a matter I will come to in a moment.

A. Okay.

Q. But I think your premise is that whether or not they are actually doing it, they do have the expertise to do it, if they wanted to?

A. That is likely, in Hong Kong at the moment, to be the source of expertise.

Q. Yes.

A. Because they deal with water quality.

Q. Indeed. They are the person -- in this development project, where most people would be more concerned with functionality, they are the ones to actually raise an alarm bell. If there is an alarm bell somewhere about water quality, that's where they should come in?

A. Yes. They should be consulted about that. Then the question is how does that consultation take place.

Q. Yes. Then we come back to the water safety plans and so on, and that philosophy.

A. Yes.

Q. May I now take you to the water safety plans that we actually had before the incident, and now, it seems, after the incident has come to light.

A. Right. Where are we?

Q. Before that -- perhaps, sorry, I want to take you to one matter first, before I come to water safety plans. May I ask you to go to your paragraph 63, because this is one part that I may have to ask you to elaborate.

Paragraph 63 -- first, you have been taken to their meetings, the first working group meetings on the Development and Implementation of Water Safety Plans of 28 February 2005. Yesterday we looked at that.

A. (Nodded head).

Q. This is where they say -- somebody has mentioned that they do have indirect control of systems --

A. Yes.

Q. -- in private buildings, in private premises. I think your evidence yesterday is that due to the time constraints you could not actually ask further and probe further what that actually meant.

A. Yes.

Q. But in fact, this is 2005, this meeting, and in 2006 we

do actually have the water safety plans from -- sorry, I don't say "we" because they are not published -- the Water Supplies Department did produce a water safety plan, and if I may ask you to look at their plan. This is C20.1, page 15582.

A. Which tab is that, please?

Q. 169-1.

A. Got it.

Q. It starts at page 15549.

A. Yes. I've got it. Thank you.

Q. You see, on this cover page, the edition, this one is 2006, in March. You see that?

A. Yes.

Q. I don't immediately jump to the conclusion that this has something to do with somebody has uttered that they do have direct control of the premises. But it seems that this somehow chronologically follows from that meeting; you see that?

A. Yes.

Q. At 2.2, at page 15555, you see the preambles?

A. I have it.

Q. At 2.2, they say:

"The WHO considers the application of a preventive WSP as an effective means to assure the quality of drinking water for the protection of public health.

A [water safety plan] systematically assesses risks throughout a drinking water supply system from the source through treatment to customers' taps and identify the control measures and operational monitoring that can manage and minimise the risks to public health."

So, in that sentence, it does seem, at least from paper here, it encapsulates basically what -- first of all your source to tap approach?

A. Yes.

Q. Because it does talk about customers' taps here, and it does encapsulate the philosophy that we looked at in the WHO paper, the chapter 4 that you referred to just now?

A. Of the guidelines, yes.

Q. Risk assessment, systematic risk assessment; then control measures, operational monitoring, from treatment to customer taps?

A. Absolutely.

Q. So in fact WSD has set out in 2006 at least to try and do that?

A. The framework is there, and the question then is at what point do they need to bring in or make contact with other people. I have been in circumstances where other stakeholders just don't want to get involved.

Q. Right.

A. In which case you've got a problem.

Q. But here, the WSP is not a publicly -- sorry, these water safety plans have not been publicly available documents. These are internal documents for WSD, apparently, as a fact?

A. That's not entirely true. You can access it on the web, but you have to know what you are looking for.

Q. It is a fact in Hong Kong that even when we asked, we had difficulty trying to get hold of WSPs, until recently, of course. Now it's produced for the purpose of this Commission. But hitherto, it's not available to the public.

A. I have said in my report that I was concerned about --

it was not clear to me how much consultation there had been with other stakeholders. That wasn't clear from the information that was available. It wasn't clear from the discussions, because there wasn't time to take through all of these things.

Q. Yes.

A. Therefore, there is a clear gap at this point.

Q. Yes. The point here that I try to make, and see if you agree, is that in that paragraph, it seems that back in 2006, the WSD did recognise the advantage of this approach and incorporated here as a preamble?

A. Clearly they recognised the importance of the approach, but, like many other organisations, when it comes down towards the tap bit, it becomes less certain.

Q. Yes.

A. That's very common. In fact it's usual, and the WHO recognised that this is a difficult area. It would have been helpful, I think, if there had been other external stakeholders, including the HD, involved. Equally, there are issues where other stakeholders need to make an effort to make contact with perhaps WSD or whatever

other equivalent there might be, in order to say, "We have concerns in this area, you have expertise; we are seeking your expertise."

Q. Yes. Well, this in fact -- I don't know whether you are aware of this -- when the idea of introducing copper pipes to the public housing estates back in 2002, there was a consultation with the WSD and they were asked for their comment, to ask them to see if the introduction of copper pipes would pose any problem. You are aware of that?

A. Yes. I've not seen it in detail. I've not looked at it in detail.

Q. All right.

At 5.1.2, again you see a multi-barrier approach being stated here, an integrated system of procedures and processes that collectively prevent or reduce the contamination of drinking water from source to tap.

Again, it's the idea of putting in barriers to ensure or to reduce --

A. Yes. I have to say that in discussions, the term

"source to tap" was used fairly loosely.

Q. Do you mean they --

A. It was really source down to the point at which water was supplied to buildings, in much of their thinking.

Q. Well, in much of their thinking, that's one thing, but what they have written down is another. What they have written down there does in fact suggest that at the time, they were thinking more -- they were thinking of the source to tap, not just source to connection point.

A. I hesitate to disagree, but I think you are using a lawyer's view of the way that these words are used. The term "source to tap" is very loosely applied and is a phrase which is used pretty well to talk about water safety plans, and many, many --

Q. You mean they did not mean to extend -- sorry.

CHAIRMAN: Prof Fawell, you are very, put it this way, generous to the WSD. Let me provide you with this piece of information. When the director of the WSD came and testified in this hearing, we then came to know that in 2015, he actually amended --

MR HO: I was going to come to that.

CHAIRMAN: He actually amended the pledge from saying

"source to consumer tap", and he actually asked his subordinates whether that could actually be achieved, and then as a result the wording had been changed to "source to consumer" rather than "to consumer tap".

MR HO: Yes. Professor --

A. I can understand why that was done, because of the complexity. My criticism of the approach is that there was insufficient recognition of the need to work together. That is where I have criticism.

CHAIRMAN: Yes.

MR HO: I understand that. I understand your point.

A. And that's on both sides.

Q. But the reason, despite all the shortcomings of lawyers -- I'm not being pedantic in this case or trying to highlight a term that probably the WSD didn't mean what they said. "Tap" does mean tap, when they actually use this in the document.

Because if I may then ask you to go to annex 4, which is at page 15582 -- now, the WSD, within their department, they have got a Customer Services Branch, and in the document they have the specific annex to

provide for the roles and responsibility of this particular department within the WSD.

Now, you see in paragraph 1.1, their mandate, this branch's mandate, is responsibility "for undertaking measures and practices to ensure the quality and the safety of drinking water supply to customers", and these are important words, "beyond the connection points."

A. Yes.

Q. So it's beyond doubt, when they were drafting this document, at least the people who endorsed this document were actually thinking about water quality to the taps, beyond just connection points?

A. Yes. I have to say, when I did visit, I did not have any contact with the Customer Services Branch. One might say that they were conspicuous by their absence.

Q. That's not what I was intending!

Yes, thank you.

A. I had expected that side to be available. I understand the difficulties for the WSD, because it was a very short time, at fairly short notice as well.

Q. It would seem at least the drafter at the time, defining

roles and responsibilities of the Customer Services Branch, has a rather broad view of water quality in Hong Kong?

A. Yes.

Q. A comprehensive view?

A. Yes.

Q. So, in some way, would you agree with me, that seemed to echo with whoever uttered that sentence or the view in their first meeting, saying, "We do have an indirect control over the quality in private premises"?

A. I would have expected a rather more detailed involvement in the development of the water safety plan. One of the things which is also apparent is that there is quite significant compartmentalisation within the WSD, and I've read a number of documents where Customer Services Branch are sort of a separate organisation. And that is not unusual, actually, to be fair, in many places, because they operate in a different way. It takes time to overcome a philosophy of separation and change that philosophy of separation to a philosophy of inclusion

and co-operation.

Q. I understand. May I -- just bear with me and let me complete this page, if I may.

We know their scope of duties and responsibility include (a) -- (a) talks about "prescribing the nature, size and quality of pipes and fittings", so they actually had their eyes on this. It then talks in terms of circular letters or waterworks safety requirements, and so on, and cites the enabling provision in the Ordinance to support what they could have done, or might have done, if they had wanted to?

A. Well, I would argue that largely they seem to have -- up to that point, they fulfilled their responsibilities in that they had materials that were supposed to be used. They agreed that approved materials would be used. Then it all starts to get a bit vague.

Q. (c) talks in terms of licensed plumbers.

A. Yes.

Q. (d), inspection. So despite all the complications about private premises, this document was drafted with a view,

at least at the time, that they recognised the importance of inspection of these inside services, upon the completion of the construction and installation of the plumbing and fittings?

A. Yes.

Q. And that of course, you also accept or recognise, is an important step?

A. Absolutely, and my understanding that in that inspection they do identify things like I raised yesterday, dead ends and teed off connections, and so on.

Q. Of course counsel for the Commission yesterday has also pointed out to you that in inspection, solder is not one of those things being inspected?

A. No, because under those circumstances, the methodology that was available for inspecting a solder was simply not available to them.

Q. Right, but this may be an explanation for -- I don't necessarily use the word "excuse", but I just say, neutrally, an explanation for the construction industry, when they look at the construction of the building.

But for somebody who would be concerned with quality

of the drinking water, this inspection would have taken a different dimension, would it not?

A. I would say that the problem has been that there has not been an appropriate -- if there had been an appropriate set of standards, and appropriate regulations, then that would have been taken a step further in terms of water quality sampling, which would have provided a verification in new buildings that lead had not been used. Now, we can talk about sampling techniques and all the rest of it. That's irrelevant at this stage.

Q. Yes.

A. Actually checking for the use of inappropriate materials I think would have then have taken place. I am concerned, and I would emphasise again, I am concerned at the lack of standards, because those standards -- the guidelines, as such, it's too soft and too easy to get away from, and I think with a set of standards, both sides then will understand the importance of what they have to do.

Q. Of course, I take this as a suggested measure going forward, but allow me to take you back to the situation before the incident, where internally, in WSD, they have

this mandate for themselves.

What I am highlighting to you in paragraph (d) here is that for WSD, that inspection, if they had done it, would have been not so much about the construction functionality, but more to do with ensuring quality of water, if they had done that inspection, if they had put in the correct parameters to address where risk might have been?

A. Possibly.

Q. Sorry, is that too long?

A. Possibly. I think that you are -- you cannot shift or grey the responsibility for making sure that the terms of the contract are met, to another department.

Q. No, no, no. You have completely misread my question. I am not asking you at this stage about who else should have been involved in the water safety plans and so on.

A. I would have -- if I --

Q. I am just focusing at the moment --

A. If I had designed it and had been involved, I would have wanted some sort of verification that the terms of the contracts were being met. In the end, it is such

a complex process that the most -- the two most useful ways of verification, one is actually using the X-ray fluorescent spectormetry to look at joints and the other is actually taking water samples and looking for lead, the appropriate water samples.

The difficulty with both of those is that we are seeing signs that within buildings, the lack of meeting the requirements is not consistent in different parts of a building. So one is faced with very difficult-to-detect problems.

Q. That's right.

A. You can take random samples but it doesn't say that your random sample is going to pick up the fact that you've got a problem.

Q. That's exactly what I want to explore with you, Professor.

Now, we know after the incident the WSD has introduced four additional parameters for heavy metals.

A. Yes.

Q. I don't see that you are disagreeing that that is

perhaps an approach with merit.

A. Yes, it does have merit. It has merit because it is attempting to investigate and ensure that there are no other problems within plumbing.

Q. That's right.

A. And that is prudent.

Q. Yes, prudent. But then the question is, first, why was this not done before the incident came to surface; or, if it wasn't done, should it have been done before 2015;

if it should have been done before 2015, should it have been done in the same way as it is now done, that WSD has now put in a circular and is advising all those stakeholders that, "These are the parameters we are going to test"?

A. It is very easy to use 20/20 hindsight --

Q. Absolutely.

A. -- and say that this should have happened.

In discussion between both HD and WSD, it was clear that they believed that the procedures that they had put in place to prevent the use of lead were working efficiently, therefore suggesting that there would be

additional and quite complicated steps at that time, without having the knowledge of what's happened since, I think would have been showing a level of foresight that might be regarded as quite spectacularly good.

Q. Sorry, you say, if one were to require, I say WSD first, to actually have that degree of foresight, in fact you say it's spectacular?

A. Barriers have been put in place to prevent the use of lead, and to suggest that WSD should have recognised the fact that there was a good chance that Housing Department would not enforce the conditions or were not able to enforce the conditions of the contract is asking a lot, I would say.

Since it has happened, clearly there are circumstances that both departments have been -- feel that they have been caught out and let down. There were other parties who clearly did not fulfil their part in the process. So I think at that time it would have been unreasonable to expect that they would have then gone and checked. It would have been, to an extent, saying that another department is incompetent and therefore we

are going to double-check on them, and that's not easy to do.

Q. Indeed. This brings me to the plumber point. Now, you know in Hong Kong the legislative framework or the design is such that absolutely nobody would be allowed to construct, install plumbing works, inside service -- I'm simplifying, but that essentially is the design of the legislative framework -- other than a plumber or somebody authorised by the WSD.

A. Yes.

Q. So the legislative design puts the sole responsibility on the plumber, because all that follows about use of correct materials, compliance with British Standards, ensuring that the plumbing work is done compliant with drawings, say for example, falls on the plumber, on the regulatory framework?

A. Yes.

Q. Of course, you just say hindsight is a very powerful thing, but if we have that legislative framework, with the plumber being the only person who's authorised to do

plumbing work, the licensed plumber, would you also say that -- well, if you were to say, without that hindsight, it would be a marvellous thing if the WSD had the foresight of going one step further and looking at the quality of drinking water, would you not say the same thing and give your equally generous remark, charitable remark, to the HD and also to the main contractors and the subcontractors?

A. Where I have real difficulty in all this, and where I would be critical, is that according to the information I have on the training that is given to the licensed plumbers, there is quite clear information about the potential health hazards of lead in water and lead soldering and that is why lead solder is not approved, and so on. Even if it doesn't say, "Lead in water is a hazard and therefore we have banned lead solder", if the level of intelligence of the people applying for licensed plumber is so low that they can't make that connection fairly easily, then I think there is a problem in the process, in the examination process.

Q. Yes.

A. I think that where there is a difficulty in the

licensing process is that it appears to be a one-step. So you license a plumber and he's licensed, and there is no subsequent re-examination or reaffirmation of the importance of the role.

And I think that is an area that is difficult, but I think that's the responsibility of the WSD.

Q. That I would also try and explore a little bit further with you later. But I'm just trying to bring you back to your earlier comment that, you know, given all this set-up, the contractual set-up, and so on -- you say, with the benefit of hindsight -- of course, you can say a lot of things could have been done. I'm just asking you whether, with that legislative framework and the scheme that we have, you might also extend your rather charitable remarks to the WSD, to other stakeholders as well, and say, "Yes, we have a contract, you need to enforce your contract", but you also have to recognise the fact is that plumbing work is specifically assigned to the licensed plumber and they are supposed to have the specialty in performing, carrying out the work,

ensuring the compliance of the materials under the legislation?

A. Where I would be charitable is that as far as I can -- of the documents I have read, as far as I can see, the roles of the licensed plumber are not as well laid out as they ought to be. So the clarity of the various parts of the role of the licensed plumber is not as clear as it should be. Yesterday we heard about a situation where licensed plumbers just signed off documents.

Q. Yes.

A. That should not happen.

Q. That is the implementation. Of course, we can talk about strengthening what is actually happening. "It's undesirable; we need to strengthen it." But I am talking about more the structural and legislative framework, in asking you that question.

You may say, "Well, the licensed plumbers are not doing their job, and therefore we need to strengthen their training, we need to perhaps see how we can deal with it", but in the legislative framework that we have,

and the legislative design that we have, they are supposed to be the specialists and not even architects can deal with --

A. I understand that.

Q. -- the plumber. Not even the electrician can deal with the plumbing work. Not even the BSE can deal with the plumbing work. They can have a higher level of perhaps checking --

A. As I have indicated -- I have indicated this in the report, that I do feel there's been a failure on the part of the licensed plumbers to fulfil their proper function, as people who have been trained to cover this area.

Q. That's right. I think also in your report you say that is very important, because especially things like the solder, once it's taken out then it's very difficult to distinguish --

A. You can see but it's --

Q. It's very difficult to distinguish lead and no lead. So their training is all the more important?

A. It is, and the training that's provided to the technical

plumbers, the trade-trained plumbers, is also important in that respect.

Q. Yes. Also, they are the ones who are supposed not only to look at the functionality of the work, whether or not it leaks, and so on, the pipe leaks after it's been joined, but also you say they also should look at the water quality, from that angle; they should pay more attention to water quality?

Or, sorry, maybe I should rephrase it. To be more alert to the effect of the use of wrong materials on water quality?

A. Yes, that's a better way of putting it.

Q. Right. Yes.

A. They should be more alert to the requirements in terms of materials, because that is a significant role. And yesterday I suggested that I personally, if I was in control of the system in Hong Kong, would like to see the licensed plumber position given greater status and therefore greater authority.

Q. Allow me to ask you later on on that, because I do think that that is an area that I would like to discuss with

you, especially I would then try to tap your experience on the UK experience.

But allow me to come back to this question first. Given that they are at least in the scheme, legislative, regulatory or whatever, the scheme of things, they are the ones who are most -- or are supposed to pay a great deal of attention also to water quality and ensure the use of materials, correct materials, to that; right?

A. Yes.

Q. Then of course, depending on what this Commission is going to find, at the end of the day, as a matter of fact, how the wrong use of material came about. I am not trying to preempt or prejudge here, but assume at the end of the day the Commissioners were to find that it is a wrong use of the materials or a misuse of the materials that contributed to the lead into the system -- right?

A. Yes.

Q. Then you are asking the other stakeholders, who are more remote from the immediate cause of this, to say, "Should I, before the incident, have a foresight into

this?"

A. I think you are rather undermining your position, because the argument is that they did have foresight because they actually put it in the contract.

Q. Yes.

A. And it was specified separately. There are not so many things that are specified so separately.

CHAIRMAN: So the control measure was put in place; it's the monitoring of the control measure that fails?

A. Absolutely. Yes, chairman.

MR HO: Monitoring, of course, we have been through all this before, is whether you have your eyes on the ball. If you have your eyes on the ball, you put in more monitoring; you pay more attention to it?

A. Yes, you don't make assumptions, and clearly there were assumptions made at a whole series of levels that something at the lower level was happening, and nobody bothered to ask, "Is it really happening?"

Q. Right. May I ask you to look at one statement. The reason why I want to explore that with you is to see whether I understand you correctly, your statement at

paragraph 63. In the middle of that paragraph you say:

"This is important since WSD do not take responsibility for water quality beyond the supply point ..."

Do you see that sentence?

A. I do.

Q. In fact I think you also say more or less the same thing -- if I may ask you to go to page 116.

A. Yes.

Q. The fifth line from the top:

"It would appear that no one had specific responsibility regarding water quality at the tap."

Paragraph 78, in the middle of that paragraph:

"It is also clear that because WSD did not take any responsibility for water at the tap and had not formally delegated that authority, no one took that responsibility."

You see, there you say, in different words, but you say WSD had no responsibility for water quality at the tap. Are you saying they themselves considered not having a responsibility or are you saying as a fact they did not have a responsibility or are you saying --

A. My understanding was that it was agreed that within Hong Kong and within the various departments, WSD would not have responsibility within buildings to the tap.

That is actually not dissimilar to many other countries. How that then operates will vary. It's only within the last 12 months that in England and Wales, water suppliers have had to take a much greater responsibility within buildings.

Q. Yes.

A. So, as far as I'm concerned, in terms of formal responsibility, that is the case.

Q. You say "formal responsibility"?

A. Yes.

Q. Despite what we have looked at, for example, like the Customer Services Branch mandate?

A. Yes, because the Customer Services Branch responsibilities are about materials, equipment, making sure the process is in place in order for those materials to be used properly.

Taking responsibility for water quality at the tap it a little bit -- you are being a little bit

disingenuous.

Q. Me?

CHAIRMAN: Of course you!

MR HO: May I ask you to rephrase that, please?

A. You have a position that you are trying to achieve and I think --

Q. No. I just want a balanced view from the expert.

A. I think the position is that it was agreed amongst a number of different departments that although they would cover things like -- they would provide the expertise to cover things like lists of materials and so on, that they did not have the formal responsibility at the tap, they did not take samples at the tap, that this would not be part of their remit.

I happen to think that that is not sensible. What I think is sensible, under those circumstances, is slightly irrelevant. Do I think it should change? Yes.

But what they didn't do, and because there was no regulatory structure, nobody actually decided who was going to have that responsibility.

Q. Yes. That I think is probably the correct analysis, in the sense that despite what they say about what they intend to do in the water safety plans, but then in the legislative framework there is not a specific mandate, to mandate them to look at the water quality at the tap -- I think to that extent I would agree with you. But they have, in fact, I think, as a responsible department, actually produced a water safety plan, general water safety plan, back in 2006, which says they aspire to do a little bit more and then look at also ensuring water quality at the tap.

A. I would agree with that, and do I think there was fault at not incorporating a broader range --

Q. Right.

A. -- of stakeholders? Yes.

Q. That was where, having set out to do one thing, and if that is taken as implemented, they should then engage other stakeholders, and if they had done, then probably this issue would have been better addressed or would not even have arisen.

A. One would have hoped that it would have been better

addressed.

Q. I see.

A. By all the appropriate stakeholders.

Q. That's why I believe also you, in your report, have in several places said "engage stakeholders".

A. Yes.

Q. I think it's paragraphs 56 and 59 of your report.

A. And the wording here was chosen very carefully.

Q. "Engaged", yes. I believe you say "WSD to engage other stakeholders".

A. Yes. They're the lead. They would engage. "Engage" means not just tell them that it's happening, but actually have proper, meaningful discussions.

Q. Absolutely. Okay. Mr Yin, on my left, says you actually use the words "external stakeholders".

A. External to WSD.

Q. External to WSD. They engage external stakeholders.

CHAIRMAN: Let's take the morning coffee break for 20 minutes. Thank you.

(11.18 am)

(A short adjournment)

(11.40 am)

MR HO: Professor, this morning the chairman has actually mentioned the 2015 version of the water safety plans put out by the --

A. Yes.

Q. Sorry, now prepared by the Water Supplies Department.

I just want you ask you to have a look at that. If you would kindly turn up B15.4 at tab -- B13.4 at tab 402, page 40343.

We have done a little bit of homework and tried to compare the three different versions of the water safety plans. You take it from me that's a diligent piece of work and what is there is actually accurate.

A. Ah, right. Yes, I've got it.

Q. As you see from the left-hand side of that page, that's the 2006 version, which I have taken you to earlier in my discussion with you. In the middle, we have a 2011 version, and on the right-hand side we have the 2015 version. Do you see that?

A. Yes.

Q. We have highlighted the changes through these three

different versions. There are one or two parts that I want you to comment on. For example, like paragraph 2.2, which I have directed your attention to this morning --

A. Yes.

Q. -- in the 2006 version. You see the highlighted part refers to "source through treatment to consumers' taps"?

A. And then through to consumers, yes.

Q. And the 2015 version cuts out the "tap" and simply says "to customers".

A. Yes.

Q. This is I think the chairman's comment this morning. Incidentally, also go to paragraph 5.1.2.

A. Yes.

Q. You see originally it was stated to be "drinking water from source to tap" -- that's your "source to tap" concept; right? And on the right-hand side you see the latest version is "from source to distribution"?

A. Yes, I see that.

Q. Do you have any comment about this -- reading literally, it seems to be a retracting of their responsibility for the water quality?

A. I think on 2.2, "treatment to customers", that could be construed as being more accurate in terms of the way that things are constructed in Hong Kong.

On 5.1.2, that arguably shouldn't be correct at all. "Source to distribution" implies that it's only just the treatment works, or sourced then to the end of the treatment works, whereas clearly it should be a lot further, and even if it is to the point at which water is delivered to consumers, then that should be clear.

So that, actually, as it stands, would not be acceptable.

Q. What I want to ask you is that if there were these water safety plans, if -- I have taken note of the document that I discussed with you this morning, about the concept of water safety plans, ensuring quality from source to tap -- would you have said that 2006, in fact, as far as water safety plans are concerned, they probably have got it right; but 2015, in fact, is a regression?

I don't mean to underestimate the difficulty or the practicality --

A. It's very difficult --

Q. -- but it is a regression, isn't it?

A. You are asking me to give an opinion of somebody's thinking, when I was not present when that thinking was taking place, so it's very, very difficult. I wouldn't necessarily regard 2.2 as a regression, because that's quite frequently what I see in many water safety plans.

Q. Yes, but would you -- leaving aside what is actually stated in the document -- have said, "What if one now stands in the shoes of the WSD today", say today -- of course, assuming the chairman may recommend that we should look at water safety plans more vigorously, "It would be a good idea, the way forward, for WSD to engage other stakeholders to develop water safety plans"? Assuming that's the position, that's the standard, would you have said, then, in that case the 2006 version should be a better model than 2015?

Leaving aside the wordings here?

A. No, I think you are missing or you are trying to put too much emphasis on one word --

Q. Ah.

A. -- when that is not the way that most people think now.

You have given me some information about changes and how those changes were made. I have not seen any evidence whatsoever as to whether that is the case or not. I only have your word for that. So I cannot put myself in the position of the director and what the director is saying.

Q. Sorry.

A. I would say that --

Q. I apologise to you, because we've heard the director and he's given evidence on that.

But leave that aside, for example. Leave that aside. I'm not trying to just focus on one word. As a matter of concept -- that's probably more important --

A. Well --

Q. -- your "source to tap" concept, would you say, as of today, if we were to look into development of water safety plans, should WSD approach that question by looking into really the concept of "source to tap", or should they simply say "source to connection point", and

then, "Because your connection point is far too difficult, far too complicated, we will leave that out for the time being"?

A. What they have said is "source to consumer" or "customer". That is not unreasonable, and that is the way that many water safety plans are actually phrased. However, within that, the lead authority, and WHO emphasise this, should be the water supplier. The water supplier as the lead authority then has responsibility to engage with other stakeholders, to ensure that the whole of the train is covered.

Q. Yes, precisely that, is because the whole point of engaging other stakeholders is to ensure that beyond the connection point these other stakeholders would also be aware of their own responsibility, how they can

contribute to safeguard the water safety?

A. Absolutely. I don't think it matters in the detail here, because it still is not clear to me exactly what the legislative responsibilities -- where they lie. I'm not sure anybody is totally sure.

Q. But it's not just about the words -- allow me --

A. But the engagement part and engaging with other stakeholders -- and that's why I actually commented about -- I was uncertain about the extent to which other external, ie people outside the WSD, stakeholders, had been engaged and been involved in the process.

Q. It's not -- don't get me wrong. I'm not sort of trying to play around with words, just pick up one word and so on. It's the concept and thinking behind it that I really want your expertise and your expert opinion on.

The whole concept should now -- the incident has surfaced, we know this matter, which affects public housing and I don't know to what extent it also affects other private developments -- but leaving that to one side, the idea, if this Commission were to pick up the idea, adopt the idea of water safety plans, as a concept, you have in your report, in paragraph 35, said WHO back in 2004, whatever, maybe that paper is 2008 but it doesn't really matter -- we are several years after that now --

A. Yes, it evolved through, but now we're in --

Q. It evolved, but the concept of water safety plans under

the lead authority is to ensure water safety from source to tap.

I'm just asking you --

A. Yes.

Q. -- this ideal -- I know you may not be very conversant with all the nice ownership matters, about how pipes belong to whom and once it goes into private premises --

but leaving that to one side, as a concept, the WSD, as a concept now, if they were to develop water safety plans, need only stop at connection point, then of course that is a very fundamental departure from what you said in your paragraph 35?

A. You are getting into the practicalities.

Q. I am, yes.

A. When we are talking about water safety plans, it has to fit -- when we come to that part, it's very straightforward, certainly between the treatment works and the point at which it goes into a building, because that's clearly under the control of the water supplier. At that point, there should be a plan. The plan may take a different form --

Q. Yes.

A. -- when it starts to go into buildings, but there needs to be a plan. The water supplier needs to be a party to that plan, and also other stakeholders that are involved.

So, yes, it needs to, but who finally takes the lead on that stage of the water safety plan will depend on the structure that you decide in terms of responsibilities, et cetera.

It need not necessarily be the water supplier. The water supplier would have an important part to play, but they may not lead in terms of the water safety plan in buildings.

Q. Can I just pause you there -- we are possibly talking at cross-purposes.

A. Possibly.

Q. What I am exploring with you is, say -- of course I'm not speaking for the Commission -- the Commission will have to make recommendations at the end of the day. I'm just saying if the Commission were to say it's a good

idea to ask the WSD to take the lead, develop water safety plans, or at least look into possibilities of developing water safety plans by engaging stakeholders; right --

A. (Nodded head).

Q. -- along the signs that we looked at, the model, the philosophy that we looked at in the paper -- now, would you say, in that case, these water safety plans ought only to look up to the connection point; or when you say "engaging stakeholders", obviously we are thinking about engaging stakeholders beyond the connection point, and that may be the way forward for Hong Kong?

A. Absolutely.

Q. I'm just asking whether --

A. I would have no problem with that. There should be a water safety plan that goes to the tap.

The situation is that in recommendations that I have made in the UK and elsewhere, recognising the complexities of dealing with plans in buildings because of the different responsibilities, and so on, and there are sensitivities as well -- what we have done is we

have referred to a customer liaison plan.

Q. Yes.

A. In other words, it's a system -- it's a water safety plan but it has less of the precision about it than the plan has up to the point of the curtilage, because you can't have the same level, unless you've got a very intrusive regime, that says, "This authority can go into your house and do it", and that's going to be not possible.

Q. Yes.

A. But there needs to be something in place that provides management plans for buildings, management advice for buildings. That's particularly important in Hong Kong because of the nature of the multi-occupancy buildings.

Q. Yes.

A. Under those circumstances, the WSD are an expert group in certain respects. They may not be quite so expert in the details of what goes on in a building. Therefore, it becomes a joint effort between a number of stakeholders, and a decision has to be taken as to which of those stakeholders, under those circumstances, is

going to lead.

So yes, they should be involved, yes, it should go to the tap, but yes, there should be a lot of --

Q. I hear you. It should go to the tap. I think that's probably the answer that I'm trying to get to.

This is basically consistent with what you said yesterday --

A. Yes.

Q. -- that they are the expert, they provide advice, and then other stakeholders will then have a responsibility of implementation?

A. That's correct.

Q. Of course, that encompasses all that we have seen in the paper, the flowchart --

A. Yes.

Q. -- the risk assessment, identification, control and all that, and then further down is the support measures, programmes?

A. Absolutely, and it recognises that when you reach that stage, it becomes often less precise, because there are so many different individual stakeholders and

requirement for individual --

Q. Of course. Yes, as a concept -- I am grateful for your confirmation that as a concept now we are looking at source to tap.

A. Yes.

Q. Unfortunately, we have heard the director, and perhaps you have not been apprised of this piece of information -- that somehow he sees the need for the revision in 2015 -- it's because he does not seem to think that concept of source to tap is something that ought to go into the water safety plans. He retracted.

A. He may well have decided --

Q. I am not asking you to criticise anybody, but as an expert --

A. No, I'm not. There could be a whole range of reasons for that. As an expert, I think it should go to the tap, and if the Water Supplies Department are the lead organisation, they need to engage, as I have said several times, the appropriate stakeholders, to make sure that there will not be a deterioration beyond the point that they have control.

They may not be able to guarantee it, but involving other people and informing them and making sure that they understand --

Q. Exactly that, yes.

A. -- where the responsibilities end and where other people's responsibilities take over is important.

Q. Heightened awareness and vigilance; would you say that?

A. Yes. I don't think that any organisation can say, "We are just going to stop here and not have any" --

Q. Yes. The ultimate goal must be to prevent people taking their eyes off the ball?

A. Correct. That's why I think we should have a regulatory --

Q. Sorry?

A. That's why I think a regulatory structure would be very beneficial.

Q. Yes. Now, on the regulatory side -- I do want to explore with you the licensed plumber. I take it you are familiar with our legislation?

A. To an extent.

Q. Basically, it's just broadly as I described to you this morning: only licensed plumbers are, under the law,

allowed to deal, construct, install -- we are talking about inside service now, but basically plumbing works.

A. Yes.

Q. The legislation provides that they should use materials that comply with the British Standards, and the British Standards are set out; right?

A. (Nodded head).

Q. Nobody else would be allowed to do that, lest they run the risk of criminal prosecution?

A. (Nodded head).

Q. You understand?

A. Yes.

Q. So licensed plumber, on this legislative design, assumes, I would say, the unique responsibility of ensuring plumbing works comply with, for example, the British Standards and use of materials?

A. Yes. Well, from the list of approved materials -- there are difficulties there, because the way that the legislation is phrased, it actually could be interpreted that the licensed plumber is being asked to take a responsibility that they may not have the capability

to take. But I take your point.

Q. You mean for supervision of their workers?

A. In other words -- no, in terms of finding out about which materials are actually approved. There should be an up-to-date list of approved materials in Hong Kong that allows the licensed plumbers to make sure that they can obtain the appropriate materials, that anybody else is obtaining the appropriate materials, that everybody else is obtaining the appropriate materials, whatever the materials, and that they are being installed.

Q. Let me pause you there again. If we drift into approval of materials -- of course we do have the procedure, called the PLU1, but never mind about that for the time being. I am just coming back to the system first, about the licensed plumber. They are absolutely pivotal --

A. Yes, I --

Q. -- to ensuring correctness of materials?

A. I would agree. From all I have read, the licensed plumber is a very important position.

Q. Yes. They are the specialist?

A. They are the specialist. I have a caveat to that. The

caveat is in the discussions that I have had with a number of people, the status of the licensed plumber in the eyes of other groups is not as high as it should be.

Q. Again, I'm not perhaps being presumptuous. I don't take over the making of recommendations. But leaving aside the shortcomings, say, of what actually -- what we see now, having heard so many days of evidence about the performance or the awareness of these licensed plumbers of the situations or their responsibility, having heard so much about it -- leaving that aside for the time being, I'm just talking about if one looks at the system, it would seem at the moment the system does place a great deal of reliance on the licensed plumber --

A. It does.

Q. -- doing the job properly. That is one safeguard for ensuring that proper materials are used --

A. Yes.

Q. -- and hence indirectly not to contaminate your water; right?

A. Yes. It's a very important step.

Q. Yes, and there is at the moment -- I don't say whether this is effective or not effective -- but at the moment there is a regulatory system in place, overseeing the conduct of the licensed plumbers, because they have to be licensed, they run the risk of the licence being revoked?

A. Yes.

Q. They can be ticked off for not -- say, for example, not performing their duties properly, all sorts of things?

A. That's correct.

Q. Now, of course, then would the problem not be so much with the present set-up, with the framework, but more to

do with perhaps the personalities involved, whether the individual licensed plumbers do actually see -- are properly trained, have sufficient training, have heightened their awareness of the important work that they do; it's more to do with the implementation, as well as how effective are the enforcement measures over that regulatory system.

A. I would agree. The implementation is, to a great extent -- it revolves around the licensed plumber.

Q. Yes. If the licensed plumbers had performed their duties, had been diligent; right?

A. Yes.

Q. Then this is a good system to have, wouldn't you say?

A. I think it's an excellent system. I think there is a great deal to recommend it, a great deal to recommend it.

Q. I apologise to the chairman if I was somehow seen to be disagreeing with him -- the way to address -- if this is a question of personality, a person not performing their duties, perhaps it is not a question of changing the system of licensed plumbers under the existing regime, to shift the responsibility to either the architect, the BS engineer or some other person to replace the licensed plumber, but the proper address would be to ensure that the licensed plumbers under the existing regime do perform their duties diligently?

A. Yes, and I have made some recommendations regarding

making sure that the licensed plumbers have intermittent retraining, just perhaps one-day courses, et cetera, in order to highlight that.

The advantage -- I don't think you would be disagreeing with the chair. I don't disagree. I think that having a senior engineer in place is important. What we have is that, with plumbing, it gets rather forgotten, bits of it because there is -- and you need one person who's actually got responsibility and knowledge around that particular area. It's a specialist area.

Q. Exactly that. Especially -- we are not talking about an individual piece of plumbing work in respect of a house in the countryside of England. We are talking about multi-storey building blocks which you find impressive in Hong Kong.

A. Yes. Absolutely.

Q. So the more that we look at the situation more, we go for specialty, specialisation, in respect of different areas of work. For example, like fire services, we see that there are dedicated -- I can't remember the term used for these subcontractors --

CHAIRMAN: Nominated.

MR HO: Nominated subcontractors -- they are dedicated, very experienced, to do fire services work. We have electricians who have to be licensed --

A. Yes.

Q. -- to do electrical work, and so on and so forth. The list continues.

Now, as far as plumbing is concerned, this is in a way, under the existing set-up, very much that, in fact to ensure a specialist does the work, not just general practitioners --

A. Absolutely.

Q. -- be it an architect or a building services engineer?

A. Yes. I agree. I think it is very important.

Q. The point really is here to strengthen the training, awareness and the monitoring -- sorry, and the regulatory monitoring of that work, of their performance?

A. Yes, the regulatory oversight of the plumbers, yes.

Q. That's right. At the moment, we do have a regulatory framework for that. WSD has the ultimate power,

disciplinary power, over licensed plumbers. As we see, the licensed plumbers involved in this case have been taken off and removed from the list?

A. Yes, absolutely. Yes.

Q. So again, it's not a difficulty with the framework, is it?

A. Well, I said in my report that I think the framework -- Hong Kong has a very good framework in place. It's making that framework work efficiently.

Q. Yes. So you engage other stakeholders, like for example the training -- VTC --

A. Yes.

Q. -- the Construction Industry Council or whatever; you engage other stakeholders to strengthen or implement better what is already a good framework?

A. Yes, absolutely. And this will start to move away from immediately water safety plans into a much broader area. But yes, it is very important that we have that level of training and understanding, and that there has to be a structure in place where the professional pride and

integrity is an important part of the process of being a licensed plumber.

Q. Yes. Allow me to draw an analogy. Say, for example, like lawyers, solicitors, barristers. Of course, there are odd cases here and there we hear of that they fall short of the duties expected by their own professional bodies. But then, if self-regulatory is considered a good thing, for the Law Society to regulate solicitors, the Bar Council to regulate barristers, still, in relation to individual cases, we just have to make sure there is a regulatory mechanism to ensure that if somebody doesn't act or perform up to standard, he is taken off the list?

A. Yes, that is correct, but it's more than that. There is a requirement to ensure that the licensed plumber is aware of responsibilities and aware of what is required at all stages.

Q. Yes. That may engage some suggestions of continuing -- education is probably the wrong word -- but continuing training, and so on?

A. Yes, and I think that --

Q. Where an occasion will be there to heighten the awareness of where things may go wrong, look at it from the perspective of water quality?

A. Absolutely, and I think it's important that such training involves groups of licensed plumbers, because, as in all professionals, working together as a group helps to reinforce the quality of the professional.

Q. Yes.

CHAIRMAN: I'm not saying that the present licensed plumbers cannot perform their job. When I expressed my statement, my worry at the time is that because of the complexity of building structures in Hong Kong, if we continue to use the existing licensed plumber system, then it may go sort of beyond the ambit of, say, knowledge and experience of the existing licensed plumbers.

So that's why I mention --

A. I think it does -- I agree with you. I think it needs to be strengthened over what it is at the moment, because I think -- the role, it does not come across as

being a professional role, and it should be a professional role.

MR HO: Then it's to pull them up to meeting that professional expectation of them?

A. And they should be treated in that way, because -- I agree with the chairman that you need to have an overall services engineer, but the licensed plumber is an important link, and therefore would be seen as very close in level.

Q. I would have reversed that order. In fact, they are the pivotal person, rather than the building services engineer, who may have --

A. I am thinking of the overall project, because if you don't have the overall project, you don't have the plumbing. The plumbing is a relatively small but important part. But you need somebody who co-ordinates the whole of the project, because you can't just separate everything out. It doesn't -- I've been involved in some of these things and it doesn't work very well like that.

So, yes, but I think that the licensed plumber is

pivotal for the installation of the plumbing and ensuring the quality of that installation, and should also have some training with regard to the design of plumbing systems, and should be consulted by architects, when they put together their plans. That's another part.

Q. I understand -- basically, your theory is that don't compartmentalise but engage another persons who may, to a degree, be more or less involved in the system?

A. I have long thought -- I have had some involvement with the International Association of Plumbing -- and I have long felt that this is a group who are very, very important, and without -- we are not using, in many parts of the world, their expertise and their role to its full, and we should be doing that. Hong Kong has got the basis of a system. I think that system needs to be strengthened, and then I think Hong Kong will have effectively a world-leading system.

Q. Good. Thank you.

Now, may I tap on your experience of the UK legislation.

A. Right.

Q. I really would like your view on that.

If I understand correctly, I thought the legislation here is the 1999 Water Supply (Water Fittings) Regulations; I presume you are familiar with that?

A. Yes.

Q. Basically, if I understand correctly, this bit at the end of --

A. It's not the only bit. There are two bits. There's the Water Fittings Regulations and there's the DWI Regulation, regulation 31.

Q. But let me just focus -- if it helps, I have some copies and maybe it's convenient just to distribute them.

I think the Benchmarking Study, we have also touched on this, and we can always make reference to that as well -- but what I am dishing out at the moment is really the regulations itself. (Handed).

In particular, I am looking at regulations 6 and 7 -- regulation 6.

A. Yes, I've got it.

Q. It would seem to us -- under regulation 6 -- now, the UK

deal with it this way:

"Where a water fitting is installed, altered, connected or disconnected by a approved contractor, the contractor shall upon completion of the work furnish a signed certificate stating whether the water fitting complies with the requirements of these Regulations to

the person who commissioned the work."

Over the page, about penalty, in regulation 7:

"Subject to the following provisions of this regulation, a person who --

(a) contravenes ..."

Then it includes (6), which I have just read out, and subregulation (2) you see:

"In any proceedings against an owner or occupier for an offence under paragraph (1) which is based on the installation, alteration, repair, connection or disconnection of a water fitting, it shall be a defence to prove --

(a) that the work in question was carried out by or under the direction of an approved contractor; and

(b) that the contractor certified to the person who

commissioned that work that the water fitting complied with the requirements of these Regulations."

Do you see that?

A. Yes.

Q. In a nutshell, the UK regime again puts the responsibility of what is called the approved contractor, and if I commission -- I as owner of a property -- fitting of plumbing work, I go to an approved contractor. He, having done the work, issued me with a certificate to certify that piece of work was done in compliance with the regulations, then he takes the responsibility. If he refuses to certify the work or issue a certificate, then he falls foul of regulation 7, he may commit an offence. And if somehow I am prosecuted, say some aspect of the works is not in compliance with running of pipes or use of materials or whatnot, if something goes wrong and I am prosecuted, I can show that piece of certificate that is issued to me as a defence to my liability?

A. Absolutely.

Q. That's the UK regime, it seems?

A. Yes. When it comes to approved contractors, it's a bit more vague.

Q. Yes. Of course, we don't necessarily have approved contractors or whatever, but assuming -- transpose it to licensed plumbers?

A. That would be perfectly reasonable. In fact, I would say that the licensed plumber situation that you have in Hong Kong, if it was strengthened, would be stronger and more effective than the UK system, although the UK system is gradually evolving to a system which would be, I suspect, not so different from that in Hong Kong.

Q. Right. So again it comes back to this point. Now, when it comes to plumbing work -- of course, we are not just -- let's lift our eyes away from applying solder, because plumbing work --

A. Yes. It's more than that.

Q. I think applying solder is probably a very small part of the plumbing work that we are talking about, and really you do need specialised people, like licensed

plumbers --

A. Yes.

Q. -- to undertake all that very sophisticated plumbing work in multi-storey buildings. Responsibility rests -- is pivotal to ensuring not just the performance, the functional performance, but also to have an eye on the ball, being quality of the water?

A. Absolutely. This is absolutely right. We have been trying to strengthen this in countries all over the world, because the people who are installing the plumbing -- you can't see water quality normally, and therefore it is doubly important. Whereas you can go and check wiring or whatever, electricity, it is not so simple for plumbing, and therefore we would like to see that strengthened.

Q. That's right. Of course, I'm not being disingenuous.

If that is the case, by comparison, you don't really want to put the onus on the property owner that much, because we are not talking about large developers here. Also, if we are looking at the regulatory regime, we may

be talking about very small individual owners, and we

may come into difficulty if one were to say, "Then we put some responsibility on the owners"?

A. Yes. The responsibility that falls on the owner is to make sure that the work is done properly --

Q. By a registered --

A. -- preferably by --

Q. Yes, because if I engage somebody to do the piping of my flat, I wouldn't be able to supervise; I would have to rely on him, being the expert, to do it properly?

A. Yes. There is a danger that we have some difficulty here, because in Hong Kong, things are rather different to -- in the UK, we have a lot of "do it yourself" enthusiasts, and there are some difficulties there, in controlling them, and also in applying liability. If somebody pollutes their own supply, the government are unlikely to prosecute them.

Q. As you say, we are not in the DIY situation. In Hong Kong there is no DIY, because all plumbing works should only be conducted -- done by the licensed plumber, so in Hong Kong the situation is very different.

A. It is indeed.

Q. If I engage a licensed plumber, then the responsibility should not be on the owner?

A. That's correct, that the responsibility is that the owner has taken the appropriate steps to ensure that the licensed person has the appropriate licence and is current.

Q. And where it falls down is that there is perhaps lack of awareness on the part of the licensed plumber to know that they have to do their job properly?

A. I think there's probably a lack of awareness right through the chain, because that chain needs to be strengthened, as the chairman has said.

Q. Thank you. Given that regime -- I know lots of things ought to be tightened up to make that regime work -- but assuming we already have a framework, we already have a regime where the plumbing works are done by supposedly a specialist, professional person?

A. Yes.

Q. Then I note what you say, that other stakeholders would

of course have to join in to make sure the whole thing becomes effective. I understand you to be staying that; I'm not misunderstanding you?

A. No, but you wouldn't necessarily -- you don't necessarily have to have everybody as a licensed plumber.

Q. No.

A. It could be that the licensed plumber is supervising others who may not be at the level of a licensed plumber but have demonstrable skills.

Q. Yes. That points to perhaps a different question. But what I am saying is, given the legislative set-up, primarily pivotal to ensuring proper installation, including the use of the right materials, falls on the licensed plumber --

A. Yes.

Q. -- then, as far as you then say, well, other stakeholders also have a role, that will be a role subsidiary to the licensed plumber?

A. Subsidiary?

Q. Ancillary.

A. Yes. That's a better word. Thank you.

Q. Sorry. You are more a lawyer than I am! Right.

Given that that was the set-up -- now, if we had good licensed plumbers -- I'm sure perhaps we have seen some let-downs doubts but hopefully that is not a phenomenon across the whole trade in Hong Kong --

A. If you had universally very, very good, very knowledgeable, licensed plumbers, you wouldn't have had the problem that you had.

Q. Exactly that.

Then we look at the ancillary stakeholders' role, in the light of assuming we have good licensed plumbers; right? Then I am of course -- I don't know whether you are aware that, for example, the main contractors engage a subcontractor to do the plumbing work. They would ensure that a licensed plumber is engaged for that purpose.

A. Yes, I am aware of that.

Q. Invariably, because the main contractors obviously don't want to get into trouble by engaging somebody who is not a licensed plumber to deal with these works.

A. No.

Q. They are contractually required to ensure that the works performed comply with the main contract; you are aware of that?

A. Yes.

Q. So that's one level of a control there, would you say?

A. Yes, clearly.

Q. Then higher, there is a layer of the relationship of the main contractor and then the developer?

A. Absolutely.

Q. And this is where another contract comes in.

A. Yes.

Q. The main contract, that the developer grants to the main contractor, to build that estate?

A. And each step up, the importance of the plumbing becomes diluted, because you have a larger contract, and the process, strictly speaking, should be designed to make sure that because you are using specialists for specialist tasks, that should prevent the problems happening that did happen.

Q. You say "diluted" meaning people more remote from the

licensed plumbers becomes less in touch with the importance of the --

A. No. They have a whole range of very important issues that they have to deal with, right back to what I was saying yesterday, making sure that the building doesn't fall down. So they have a whole range of different things, and equally they are very, very important. But plumbing may not be seen -- because in the whole relation to a project like that, it is a relatively small part, but it is a very important part. That's why it is important to have specialists and a system that ensures that that is delivered properly, because the long-term impact can be quite significant.

Q. Again, that's where your eyes on the ball becomes important. Because it's a small part, it may be overlooked, then somebody would have to draw everybody's eyeballs back to the ball?

A. Absolutely.

Q. Then we go back to the whole philosophy about that paper, water safety plans, and all that comes in?

A. Yes. Within a water safety plan, one of the parts of

that would be that you must have an appropriately qualified person who is aware of their requirements, and so on. So that's --

Q. Risk identification, hazard identification and all that comes in?

A. Yes. To an extent, you have that already; it's just not laid out in that form, and would perhaps benefit from being laid out in that form.

Q. Yes. One gets wise after the event. If we had the water safety plans earlier, then perhaps --

A. That's what water safety plans partly are supposed to be about, learning from experience.

Q. Yes. I'm just trying to see whether you are aware of some of the factual matters in this case. Now, it's not the case -- I say "HA"; HA or HD, it doesn't matter -- that the Housing Authority just say, "Okay, we have this provision in the contract and we wash our hands of it already" -- it really is not that.

A. I am aware of that, and I have discussed it with the Housing Department, senior people within the Housing Department. It's not at all that. It's a matter of it

gets lost in all the other stuff, and that's why having in place the appropriate requirements, and understanding from individuals of the importance of their particular area, but also it has to be seen at a very high level, at the higher supervisory level, the understanding that this is important, and when the person who's responsible, perhaps the licensed plumber, says, "This is important, we have to do this", they take notice, because they have some responsibility in this.

Q. Yes. This is why I don't want anybody to misread your report, especially paragraph 47, where you talk in terms of the HA responsibility and role; paragraph 78, you again refer to HA's responsibility and role.

A. Yes.

Q. I just want to put those two paragraphs in context of our discussion so far. The regulatory regime, the existing regime that we have -- we have the licensed plumbers, we have WSD; these are the entities, shall we say, who should have their eyes on the quality of the water -- "should". Whether they did is probably a different question. "Should"; you would agree with

that?

A. Not necessarily, because it depends on the structure, regulatory structure that you have in place.

Q. I've been through all that with you.

A. You can't say -- that's why I'm not prepared to --

Q. No. I'm just -- I think I'm trying to give you the balanced approach.

A. Okay.

Q. It's not that nobody else should even look at it. I'm not saying that for one moment.

A. No.

Q. But primarily, the ones in a big project, complex project like this -- I think you yesterday also said, "Yes, these other people, quite rightly, their primary priority was to make sure that the building that they have put up is not going to fall down, so they may have lost sight of water quality." That's your evidence yesterday.

A. Yes.

Q. So eyes on the ball.

A. Yes.

Q. And I'm saying, in this scheme of things, when you make your comment in paragraphs 47 and 78, we have to look at the situation where, in a multi-faceted construction project, when it is likely that other people have their eyes on some other matters of priority to them, then if one has to introduce back into that monitoring system the monitoring of water quality, then the job is really primarily on the experts.

A. Yes, but there is a requirement at the higher level, at the early stages of, let's say, the project that when requirements are put into a contract, that the people putting together the contract understand why those requirements are there. It was very, very clear, from the evidence given, that there was no understanding of why there were requirements in that contract. So it starts to crumble a little bit around the edges here.

Q. In order to make people understand, again, the need for heightened awareness, you need to identify that as something you should watch out for?

A. I would argue with you that if you highlighted an item

within a contract, you, to an extent, should know that that is important. If it's not important, why is it in the contract specifically highlighted?

Q. I just want to draw attention to a few things, to see whether you have any comment. In the project administration, in a project administration, for example like HA as developer of the project, they would require -- HA had a requirement that main contractors --

A. Yes.

Q. -- should manage their subcontractors. You are aware of that?

A. I am aware of that.

Q. Of course, in this connection, managing subcontractors to perform duties required under the main contract also means monitoring use of correct materials; you are aware of that?

A. It does. It does.

Q. Also, are you aware that the main contractors submit --

A. Yes.

Q. -- the subcontractors', what is it, management plans --

A. Yes.

Q. -- to the HA, in which, on paper, they say they will monitor the use of correct materials? Are you aware of that?

A. Yes, I am aware of that, and that's why I have made the recommendation that in the contracts, before the contracts are let, it's very important that the HA make sure that there is a quality assurance train put in place by the contractor, to make sure that things like this are actually followed through. And that's in the interests of the HA as letting the contract.

Q. Of course there is this process of the approval of the use of materials, and you are aware of that?

A. Yes.

Q. There is no suggestion in these proceedings at all that an approval system has gone wrong. It's not the approval, because when it is submitted for approval, solder was submitted and was approved, and the substance that has been approved is FRY 99. So, in that aspect, there is an approval system in place, and in this case it's not because the approval system has gone wrong?

Are you aware of that?

A. Yes, I'm aware of that, and it's somewhere that I'm not -- I have some difficulties with what you are saying. I think the reason that the system has gone wrong is because the approval is very much a case of just looking at what the paper says, "We are going to use the right materials, this is the list of materials we are going to use". And again I would re-emphasise, my recommendation is there is a quality assurance -- the HA need to make sure there's a quality assurance process in place before they let the contract, as part of the contract requirements.

Q. Yes. This is --

A. To make sure that all the way down --

Q. I understand that. But perhaps you can address my question. In the quality assurance -- in the contract, there is a requirement that the main contractor will have to use approved materials; subcontractor will have to use materials that comply with the main contract, which indirectly means they also have to use the correct materials.

There is in place an approval system, and in this

case the approval system has -- there is nothing to suggest the approval system falls short in the sense of wrongly approving leaded materials to go into the plumbing works. The approval system has shown that only FRY 99C grade lead-free solder should be used.

A. Will be used, yes.

Q. So it's not to do with letting out the contract or the approval system. These are control measures, would you not say? According to the flowchart, these are control measures that are properly in place?

A. They are not presented in quite that way at this stage, because the importance of them as control measures is clearly, from the evidence of senior staff in HD, not understood. So there are some issues in the climate of approval, perhaps that's a way of saying it. If you don't understand the reason why it's important, then the emphasis in the contract is perhaps not as strong as it ought to be, or the application of the contract, shall I say.

Q. I understand you. You are not saying somehow this control measure itself is defective. It's people

involved in the control --

A. Absolutely.

Q. Again, it's a question of implementation -- people involved in this control you say should have a heightened awareness of why particular things are put there as control?

A. Yes, or in this case at least some awareness.

Q. Some awareness, yes. Well we heard that they had a general awareness of the health effect of lead but not --

A. Well, the chief architect said that he wasn't aware that lead could be a problem.

Q. But we had other evidence as well.

A. Yes.

Q. Then the question really is that -- again, it's not the question of somehow this system is -- these monitoring measures or controls are wrongly placed. It's not. These are proper controls in the system?

A. It has been throughout the implementation of the controls.

Q. Exactly. Then it comes to -- implementation, of

course -- we are looking here not wholescale of standards falling short, but then, on a very specific matter of the solder posing -- which is allowed to leach, the wrong kind of use of the material with the result of lead leaching into the water --

A. And also some of the figures.

Q. -- then it's a very specific risk, isn't it? It's not the wholescale of things breaking down, or your control breaking down?

A. That's one of the issues. It is very specific but it's very importantly specific, and also the use of the low-lead copper alloy fittings; it's another area.

Understanding why that's important is key to appropriate implementation.

Q. Yes. Now, I don't think we -- I believe --

A. I think we are saying the same thing.

Q. We are stating more or less the same thing; it's just a question of emphasis.

A. (Nodded head).

Q. Then ultimately I have to say, understanding of course, as you say, why people have taken their eyes off the

ball was because maybe for a long time nothing has gone wrong, so people have lowered awareness?

A. That's what the water safety plan is supposed to fix.

Q. Exactly.

A. By having processes in place and being renewed and reviewed, that is supposed to take away the risk of people saying, "It's never happened so it's not going to happen again."

Q. Exactly. That was where all that risk management, risk identification, all of that comes back into the picture? You agree?

A. Yes. Absolutely.

CHAIRMAN: But then when copper pipes were introduced in, say, 2002 to 2005, the HA simply did not conduct or did not identify any hazard in respect of lead at all?

A. No.

CHAIRMAN: And therefore there was simply no risk assessment whatever?

A. Yes, from what I've seen, that was the assumption, but it's more or less what you (indicating Mr Ho) are also

saying, that because there was a requirement in place for low-lead solder at that time, it was just assumed that you would not get any of the other hazards. There wasn't a proper hazard assessment and risk assessment, and the hazard assessment was, "Well, lead can come from solder. We've put this process in place. Is it possible for lead solder to be used?"

MR HO: Yes.

A. And the answer, quite clearly, has been "yes".

CHAIRMAN: Not only lead solder but, as we have looked at the specifications, in fact save and except for a few items, almost all the materials within the plumbing systems have not been required or were not required for QC or checking whatsoever.

A. That's right.

MR HO: Of course we will have to deal with that, but the question also is those people -- for example, the plumbers, WSD, who have or at least should have their eyes on the ball should actually raise -- if they see that that may be an instance where there might be

a risk, to raise it?

A. Yes, and I think there is also an issue around as to the procedures that they have in place at that level on a day-to-day basis, to ensure that things don't go wrong.

When people -- let's say plumbers -- when the plumbers are under pressure to get work completed, if you run out of unleaded solder, are you going to, if particularly -- I don't know what the contract conditions are for them, but if you are not getting paid while you go off to find some unleaded solder, and you happen to have some leaded solder, there will be a very strong temptation to use it.

Q. Yes. That comes back to the actual monitoring of materials delivered on site, and so on.

A. And ensuring that the process of supply, et cetera, is appropriate for the circumstances.

Q. To that extent, of course, you know it's the main contractors -- I have already put it to you that in the subcontractor's monitoring plan, it says they will make sure that the correct materials are being delivered to site.

A. Yes, and there's been effectively a series of failures

in that respect.

Q. Right. Of course, then -- yesterday, I think counsel for the Commission has canvassed with you certain aspects of the verification aspect, like the form 6210 of the HA. Now, are you aware that in fact that form is updated through a process, again, of assessing what are items that may go wrong and addressing the relevant items?

A. I'm not specifically aware of it. I would be surprised if it wasn't updated at intervals because of --

Q. Yes, and that is the result of, I don't know whether you are aware of the deputy director's evidence, when she came along and gave evidence quite early on in these proceedings. She said that updating the process depends very much, for example, on whether or not in the past there's been a problem with certain materials?

A. Yes, I was aware of that.

Q. Again, that's a matter of risk assessment there?

A. Well, it's also -- it's risk assessment and understanding the hazards, both of those two, and if you don't understand the hazards, if you are not aware of

the hazards, then you are not aware of the risks.

Q. Of course, you are not suggesting that -- because people in the position like a developer, like the HA in this case -- perhaps it also applies to other private developers as well -- you know, they should 100 per cent check on materials delivered on site. I don't see that as your recommendation?

A. No. I think they should be delegating -- there should be a clear delegation, clear responsibilities, clear demarcation of responsibilities, and that has to be clear. I haven't seen the contracts themselves. I obviously wasn't here when the process was going on. But having talked to a number of people who were involved, fundamentally everybody is so busy, there was not the proper presentation or clarification of that sort of --

Q. But it wouldn't -- on a complex project like the high building blocks we have, it wouldn't be an efficient use of resources, if the developer were then to monitor each item of materials that come onto the site? It's just practically impossible.

A. Right, but the process that's been suggested solves that problem, that for some of these smaller items which are difficult to identify, that there is central purchasing.

Q. Of course, this is what is being recommended. But I'm just saying, before these recommendations, and I see in your report you have actually endorsed these recommendations as being positive and constructive and I think you also used the word "appropriate" -- but even before the introduction of these measures, you don't expect the developer to have to devote the resources of having to check on materials 100 per cent? It must be a sort of selective process?

A. Yes, and basically, what I would expect the developer to do -- that the developer knows their responsibilities and that they have overall responsibility. The contractor, for example --

Q. On the construction side of things.

A. Absolutely, and I would expect them to have in place procedures that will ensure that their subcontractors and others will properly carry out the checks that are

needed.

Q. Yes. This is where I think counsel for the Commission yesterday was also saying -- now, in contract administration, it's not just developer, main contractors, subcontractors.

A. No, no.

Q. But to avoid people taking their eyes off water quality, then WSD does have a role to play, even in the contract administration, the project administration?

You have agreed with my learned friend there.

A. I think that they do have a role, but again it goes back to consultation.

Q. Engagement?

A. Yes.

Q. Right. I understand "engagement", because you use "engagement" in a very special sense.

A. Engagement is a two-way process and it's something that I believe is very important for Hong Kong, that departments, groups, need to be prepared to engage a lot more. It's not an erosion of their authority. It's a reaffirmation of their authority.

Q. And the engagement that we saw -- I apologise if I'm repeating myself -- has been also that when copper pipes were introduced, the WSD was specifically asked to comment about the use of copper pipes. That's a form of engagement, isn't it?

CHAIRMAN: I think there are also constant, regular meetings between the WSD and the HD, regular meetings between them, to exchange different views on matters. So there are the platforms, but exactly what they talk about, that's another matter.

A. I would agree, Chairman. I was about to ask that: what do they actually cover and is it really important stuff?

MR HO: The old chestnut: really, perhaps the ball has not been particularly identified for the eyes to focus on?

A. Yes. I think that's a very good way of saying it. I think now that we have had something that's gone wrong, there's nothing like something going wrong to focus minds on what they should be focusing on. As long as it doesn't take them away from things that are important that they have been dealing with.

CHAIRMAN: It's now 1 o'clock, and I think some of you do

have lunch engagements. Let's go to our engagements.

(1.00 pm)

(The luncheon adjournment)

(2.30 pm)

CHAIRMAN: Yes.

MR HO: Professor, there are just a couple of perhaps smaller points that I want to discuss with you.

Can I invite you to go to paragraph 94 of your report, please, at page 123.

So understand your paragraph in a perhaps more positive and constructive light, are you suggesting that now that the incident has come to light, there should be a more co-ordinated effort? You here, in the fourth line of the paragraph, suggest a manual covering installation of plumbing works in buildings Hong Kong.

Do you see that?

A. Yes.

Q. Is that the sort of water safety plans that you have in mind in making that comment?

A. Yes, and it would be really taking the process and then developing, using that to develop a document that would

help all parties, putting all of the information in one place, and pulling the various points together, because one of the things that is apparent is that information is quite diffuse.

Q. Right. I see.

A. It's an opportunity for the two departments to actually pull together the information and the requirements and put them in one place so --

Q. No -- sorry.

A. No, no, that's --

Q. Because I notice that you seem to suggest that there should be a manual, you say "covering the installation of plumbing in buildings in Hong Kong" -- now, you are not confining yourself, for example, to public housing? You are thinking of something larger; am I reading you correctly?

A. Yes. I am thinking of something broader than just the public housing.

Q. Broader.

A. Plumbing takes place -- plumbing goes into loads of buildings and it is not unreasonable that there should

be a document that guides everybody.

Q. Indeed. You are not just thinking about the WSD or the HA, who mainly deal with public housing; you are also thinking about, for example, other government buildings it would be the ASD or the Buildings Department, or even private developers or institutes of whatever?

A. Yes, I think they would have an input, and this is a real opportunity for Hong Kong to deal with the plumbing issue on a much broader basis, to ensure that in the future problems are not going to arise, whether they be in public buildings or private housing or in public housing, and avoiding the problems for the future would be good.

I think that the experience that the WSD and HD have had over this incident puts them in a very, very good position to take the lead on something like this.

Q. Certainly. I read that as an invitation that there should be co-ordinated efforts for not just the two named departments there --

A. Absolutely.

Q. -- but, you know, on a broader scale including other

perhaps other stakeholders which perhaps have not been expressly mentioned here?

A. Absolutely. I just left it as "stakeholders", because that can include -- I don't know all of the different groups in Hong Kong. So that would include whoever is appropriate.

Q. Do you envisage a separate document for, say, water supply as opposed to drainage and sewage?

A. I think there are advantages in having one document with three separate sections, or you could have one document.

It gives you the opportunity to start the process, and having got one document then you can move on to others, because I know how these things take time, and having a model document is actually quite beneficial.

We have a situation here where this relates to public health directly, and plumbing is very important. In terms of water safety plans, you have there a reason for dealing with it, and to an extent you could also incorporate management procedures for such things -- building management procedures of plumbing for such things as Legionella control.

Q. Thank you.

There is just one minor point I would like to discuss with you. That goes back to paragraph 18 in your report, please, on page 95. In paragraph 18, the premise there is that the task force, in their report, have looked at three houses, two from Kai Ching and one from Kwai Luen, and there they have done isotopic tests --

A. Yes.

Q. -- and so on, to find out whether in fact the lead is mostly contributed from the solder or maybe other parts of the plumbing system.

A. Yes.

Q. So that's the context. You say then, over the page, at the top of page 96:

"... it is reasonable to make a worst case assumption that the findings of the report would apply to all of the developments ..."

What I understand you there to be saying is that of these 11 estates, even though the task force has looked at two houses, two blocks from Kai Ching, one from

Kwai Luen, but it is a reasonable assumption that the same may apply to the other nine estates, and therefore one can make a worst-case assumption they probably did; that's the scenario that we are looking at?

A. Yes. My view is that taking a worst-case assumption from that is the best possible position. You are not making assumptions that all is well when it's not.

Q. Right.

A. And in view of the fact that you needed to make some progress, going back and sampling and going through the full process, all of the other buildings would take a long time.

Q. So you make an assumption that what you found in Kai Ching and Kwai Luen may apply to the other nine estates?

A. Yes, and then you can go back and do sampling as appropriate.

Q. This is where I want -- your last sentence here, this is

where I want to draw your attention to. Of course, now, I don't know whether you are aware that remedial

works -- you talk about remedial works in the last sentence of that paragraph.

A. Yes.

Q. I don't know if you are aware, in fact remedial works are being undertaken to replace the parts that may be affected by the solder --

A. Yes. I have been made aware of that since I arrived in Hong Kong.

Q. So we are not going back to further testings, because the worst-case assumption has in fact been adopted, and then remedial works are being undertaken in all of the 11 estates? You are aware of that?

A. I am now aware of that, so that, to an extent, is redundant as a recommendation.

MR HO: Thank you. Thank you very much, Professor. I am very obliged for you to have put up with my questions. Thank you.

Cross-examination by MR LEE

MR LEE: Professor, you said that you would use two terms interchangeably, "Housing Authority" and "Housing Department"; is that right?

A. I have done that, yes.

Q. I think most of us have done that and will continue to do that. Don't worry about it. But do you also use other two terms interchangeably, "Water Authority" and "Water Supplies Department"?

A. I have used Water Authority very rarely. It's mostly "Water Supplies Department".

Q. Because you are aware of the distinction?

A. There is a distinction, yes, but there is also a blurring of the boundary between the two.

Q. I can see that you are a little saddened by the fact that the two departments don't seem to be tangoing together?

A. I am concerned this seems to be a situation that I have seen in a number of circumstances in Hong Kong where there is a lot of compartmentalisation, and compartmentalisation often leads to a lack of proper co-ordination between different groups.

Q. Even during this hearing, you see two different groups of lawyers.

A. Yes.

Q. In a way, they are really two men in the same boat, and

if the boat sinks, they both get into lead-infested water?

A. Yes. Yes.

Q. You have been asked questions on the framework of water safety.

A. Yes.

Q. But there is also a manual, isn't there? I will give you just a few pages to look at and ask you just a few questions on it.

The origin of this, this is a photostat copy, one of my juniors actually went to the web and he has photostatted it now. I'm sure you have seen that before? (Handed).

A. I am aware of this.

Q. I am sure you are familiar with it.

If you start from the second page and turn to the back page, you see a chart.

A. Yes.

Q. Most of the things there, of course, are already to be found in the framework?

A. Yes.

Q. You see for instance at the top you have "Preparation", and then in the left side you have "Feedback" and then in the middle you have "System assessment, operational monitoring", and then "Management and communication", and on the right-hand side you have "Upgrade". I shan't read the other words because I haven't read them before and I don't intend to read them now, but I assume it's the same as the framework.

Then if you look at the contents, these are the sorts of things that you would expect to find in any well-prepared water safety plan; right?

A. Correct. There may be modifications. It is a guidance and it is intended to be used with thought and care.

Q. Yes. But you have been looking at Hong Kong's own water safety plan, different versions of it; right?

A. Not so much the water safety plan but the layout of -- and indeed it's not --

Q. You don't consider that to be a plan?

A. I don't consider that to be a water safety plan.

A water safety plan has got a lot more to it and you cannot -- a water safety plan is not just a single

document.

Q. No. But the trouble is they call it a plan, a water safety plan.

A. That's because that tends to be shorthand. I don't want to get into areas where I suspect I may not be in a position to answer, because I have not spent a significant amount of time with the department, in order to go through the process of the water safety plan --

Q. But you have read that document?

A. I've read the document, yes.

Q. And from what you have said so far in answer to my questions, I don't suppose you would consider it actually to be a water safety plan as such?

A. It's the outline of the plan that's being put in place by the WSD.

Q. It's a skeleton, or not even a full skeleton?

A. A little bit more detail but basically it's a skeleton, and of course they've got the complexity of the fact that they've got a whole series of different sources, different treatment plants, and so on. So they talk

about how that's dealt with, and that's very important, and I fully accept that and agree with that.

Q. You mean you don't consider it to be a water safety plan as such?

A. That's not the water safety plan. A water safety plan is not just a document. A water safety plan goes way beyond that, and it's got a whole range of different steps in for different treatment works. It's simply not possible to put that into that document. There will be a number of other supporting documents which are really important for it.

Q. Of course you cannot, in the context of this case, for this public housing -- you cannot have a water safety plan in relation to these houses or these blocks when the water stops at the connection point?

A. That's not strictly true.

Q. You mean you can have a water safety plan when it stops at the connection point?

A. We are in danger of going back to lists of chemicals and the guidelines, the guidelines and the guidelines and the guidelines. They provide guidance. With a water

safety plan, a water safety plan -- there isn't a particular form of a water safety plan, but a water safety plan should try and cover something about internal plumbing systems and delivery to the tap. That may be, in some cases, may start off as being very, very basic, but it can go on to eventually develop into something much more extensive. And the plan can take a number of different forms. There may be a range of versions of what will be done in management within buildings.

So, yes, it's possible, but it's not possible for WSD to do it on their own. That is not possible, and they would need to work with other stakeholders in order to do that. But it wouldn't necessarily be their first priority. Their first priority would be to start the process of the supply train.

Q. Of course. I know you are a very charitable man. You are trying to be nice.

A. No, I'm being honest. Having worked with water safety plans and --

Q. So that cannot be a water safety plan, can it?

A. Yes, it --

Q. They don't really care what happens to the water once it passes beyond the connection point. They don't even care anymore.

A. I don't think you can say that. In terms of a water safety plan, you go as far as you can and then you start to develop beyond. They have dealt with much of what is directly under their control. There is a need for that to go further, and that development further will involve a lot of other people.

Where my criticism lies is that in the initial establishment of the process of water safety plans, I think the level of engagement, to use the term again, with other important stakeholders has not -- I do not see that clearly in the information that I have been given and I've been able to see, and in the discussions.

Q. So they haven't reached even base 1?

A. Yes, they have reached base 1. They've done quite a lot.

Q. Well, what is that?

A. And the water safety plan with regard to the treatment

works, certainly, and much of the catchment; I think things can go further.

But a water safety plan must not be considered as something which is prepared and that's it. That's not how it works. It should work by you start off with what you've got available, you make sure that the processes you have in place are working properly and efficiently at all times, and that is often a starting point. But you certainly don't have, "That's your plan." It will develop and it will continue to develop over time, and I would hope and I would anticipate that WSD will continue to develop those plans, and following this Inquiry I'm sincerely expecting that they will be working with the HD and other stakeholders to take the plan over the next stages.

Q. Professor, you are not only a charitable man, you are also a man of hope. You are hoping that they will --

A. I have every reason -- I have seen every reason to believe that this is going to happen.

Q. Yes, I also want that to happen, because I represent the people who have been somewhat affected by this; right?

But you see, the trouble is, the Water Supplies Department want to go back, according to some questions asked you of this morning -- you see, instead of "from source to tap", it's no longer from source to tap, so how can it be a safety plan?

A. The safety plan has -- you are asking something different to a water safety plan. You are saying, in terms of the responsibilities and statutory

responsibilities, et cetera, should WSD have responsibility right through --

Q. No.

A. But that's exactly what you are implying, because in a water safety plan, WHO recognised that there may not be the authority available to deal with different bits. So a water supplier may not -- it is recognised fully --

that they may not be able to fully engage in what happens within buildings, because it may be outside their control, and so on.

There is an issue here and that is in terms of how Hong Kong decides that it wants to determine the

responsibility, and regulatory responsibility. That is not clear.

The problem that I have encountered is that it is not clear, and it is difficult for a department that's already taken or it is agreed that a position is taken, that then they say, "We are going to extend our authority beyond this point."

It is what should have happened -- and this is where I would agree -- I think WSD and the other stakeholders, Housing Department, et cetera, in this particular case, HD, should have been talking much more closely, and understanding that there is a need to ensure that water quality in buildings is covered.

And the point about the Legionella is a particularly pertinent point, because that is something that many, many countries have approaches to managing and dealing with water in buildings, in order to manage to prevent Legionella. It's not just in air-conditioning units.

Q. No.

A. So what you are saying is really to take a position that is pushing for me to say that they should have had

authority to a particular point, but I can say that many other countries don't have that.

Q. I don't think you understand my question. You have given me a very long answer. The question is very simple. I'm looking at it from the consumers' point of view, and when you talk about the safety of water, water safety, I suppose it includes drinking water?

A. It does include drinking water.

Q. And I get my drinking water from the tap.

A. Yes.

Q. So if it is not even included in the grand plan, water safety plan, the water which comes to me in the tap is excluded, because the water stops at the connection point, so how can it be a water safety plan?

A. Sorry, that's not how a water safety plan works. That is not how a water safety plan works. And a water safety plan is not a replacement for regulation. It is an adjunct to regulation.

Q. Yes, in case something goes wrong, then they know how to react quickly?

A. And also they can -- it responds, and it develops, and it builds over time.

Q. Oh, yes. But the overall objective is to ensure that the quality of the water is good, the water which comes to the consumer?

A. Is safe.

Q. That's the whole object of it.

A. The overall objective.

Q. I know there may be all sorts of difficulties encountered. I'm not accepting it, but even assume that the Water Supplies Department have no control over the water once it gets into the public housing -- even assuming that; I'm not putting the blame on them yet -- all I'm saying is if that is so, then the document they have prepared cannot properly be called a water safety plan?

A. I'm sorry, but it can. The WHO does not see this as being you have to have something all the way from source to tap to start with. It's something which is under the control -- it starts off with the water supplier. It's very important that they have control over the water supply parts.

Q. So does the WHO consider that a plan can be properly called a water safety plan when the water stops at the connection point?

A. Well, it doesn't stop. The water safety plan will go to whatever bit that you want to take it to.

Q. So a water safety plan in this context, as far as the Water Supplies Department is concerned, is their plan to make sure that the water is safe when it reaches the connection point?

CHAIRMAN: I think there are many different kinds of water safety plans.

A. Absolutely, yes.

CHAIRMAN: There are water safety plans for, say, the reservoir, there are water safety plans for treatment, and there are water safety plans, say, in Hong Kong, for pumping stations or pumping substations, et cetera. So these can be regarded as proper water safety plans.

But what you are talking is a different species. You are putting all those that I have mentioned aside and you are concentrating solely on the public housing

estates.

MR LEE: For this reason: because those plans have nothing to do with the consumers. They may not have anything to do with Housing.

CHAIRMAN: I understand that. So at present there is no such water safety plan for housing estates and there's no water safety plan for, say, even private developments.

So I think the Professor definitely will accept that. So when you are talking about a water safety plan you have to be specific in order to elicit what you want.

MR LEE: What I want is simply the water which reaches the consumer, but if you tell me no, for the purpose of this case, there is no such plan, then okay, I --

CHAIRMAN: There is no such plan after the connection point.

MR LEE: Is that right?

A. At the moment.

Q. I don't know whether you have read this book, "Hong Kong Water Supply -- Reducing Lead in Drinking Water" -- A1, tab 21, published by the Government Logistics

Department, but obviously you can see the information that has come from the Water Supplies Department. It's a document like this, a little book.

A. Yes, and I've copy of this at home.

Q. Have you read this before?

A. I have.

Q. Then if you turn to page 1, it says, "Drinking water supply in Hong Kong":

"The Water Supplies Department (WSD) is committed to providing quality drinking water 24 hours a day to the public."

Then it talks about "raw water from Dongjiang" and so on. Then right at the end, the last sentence:

"It is then routed through building's internal plumbing system which includes a sump tank, a roof tank, pipes and fittings before reaching the customer's tap."

Then if you turn over to the next page, you see a plan -- you see the lot boundary, and so on; right? This is page 2 and page 3. Then if you turn to page 4, at the top you see, "Water quality conforms to international standards", and then on both sides you

have "100 per cent premium", with stars, and so on, and then "Water Quality Conforms to International Standards".

"The quality of drinking water supplied by the WSD fully conforms to the WHO Guidelines. A Water Safety Plan in accordance with the WHO Guidelines has been in place since 2007 to further ensure a safe water supply to customers."

That is why I am asking you these questions; do you understand? I took them to mean they already have a water safety plan, in accordance with the WHO Guidelines, since 2007, and so the consumers ought to feel safe?

A. They have, but WHO, in its advice on water safety plans, does indicate that if you don't have the control over the building, then you need to get in other stakeholders and there needs to be a different approach to the way that that is delivered.

Q. Yes.

A. Now, they are providing water, according to their summary. Where I would say there is a problem here is

where they call about lead, chromium, cadmium and nickel et cetera. There I would say since the sampling for that needs to be at the tap, one can argue that that is slightly misleading.

Q. The whole thing -- I think the whole concept is at the tap. The whole concept is at the tap, right from the beginning, page 1, "Reaching the customer's tap."

A. It doesn't specifically say that, and the reason it doesn't specifically say that is that many of the parameters that are in the guidelines -- and this is a problem with just taking the guidelines -- many of the parameters that are in the guidelines are covered by raw water treatment and distribution, and they will not change in the building. There are a limited number of parameters that change in the building.

Q. The point is, when a customer gets a booklet like this, he reads it and he feels very happy; the water is safe?

A. That's a completely different question, whether the booklet is helpful or misleading for consumers is a completely different question and I'm not prepared to comment on it.

Q. I agree, but my question is that actually the water people, the Water Supplies Department people, considered that their document already is a water safety plan, in accordance with WHO Guidelines. This is how they consider it, and they want the citizens of Hong Kong to read it that way?

A. And on this they point out that the waterworks and the Water Supplies Department finish at the lot boundary. So, in actual fact, it is not clear -- it doesn't make it as clear as it should be, but it is trying to make out that the water safety plan is something that it is not.

Q. Precisely.

A. No, you are trying to make out --

Q. Sorry, I'm following their thinking. The chairman correctly put to me that there were other plans and these other plans would stop at the connection point. But I am looking at their own document, which disavows that. It says all the way to the tap.

CHAIRMAN: I don't think Prof Fawell can speak on behalf of the WSD.

MR LEE: All right.

CHAIRMAN: I think the witness for next week, one of the witnesses is the deputy director. You should direct your questions to the deputy director.

MR LEE: Yes, I will do.

CHAIRMAN: I understand what you are saying.

A. I understand, Mr Chairman. I'm not prepared to answer but I understand.

MR LEE: Maybe I'm the only person who doesn't understand.

CHAIRMAN: So what you are saying, in effect, Mr Lee, is that the first statement in fact is a half-true statement?

MR LEE: Yes. But they all, from the customer's point of view, they all want to see this water safety plan, but there has to be a water safety plan in accordance with the WHO Guidelines, and so far we haven't got it?

A. With respect, I would say that what customers want is water that meets the standards.

Q. Of course. Of course.

A. That's slightly different.

Q. I know. We are all agreed on one thing, and that is the water I drink has to be safe.

A. Yes.

Q. And so far I know it's safe because it's from inside a bottle.

A. Do you know? And what is your basis for that?

Q. I opened it this morning --

A. You've been told it's in a bottle, you've been told that it's safe; you have no verification for that.

Q. Not even that, more than that, I found it in the bottle and I had to open it like this (demonstrating), but I agree with you, it could still have been tap water, it could still be?

A. It could very easily be all sorts of water.

Q. Yes, yes. I also saw TV programmes to say that in fact sometimes tap water is cleaner than bottled water?

A. It can be, and one has to be very careful. What you are trying to do is really say, well, we need to have standards, we need to be able to demonstrate to the public, to consumers, that their water is safe. There has to be a way of doing it. Just having a water safety plan is not necessarily going to demonstrate to

consumers that their water is safe.

Now, I understand the position, and I think it's very important, because confidence in the public water supply is I believe absolutely paramount.

Q. The test of the water is in the drinking, not taking a shower?

A. No. I think in a lot of cases that's true. The taste will be very, very important, its appearance, its temperature, and so on. But you can't see contamination.

Q. That's the problem.

A. That therefore becomes important. I think that in Hong Kong, the way that consumers have been -- I think it's not unreasonable to say let down is that the various processes that were in place, that were in place, to prevent the contamination occurring have broken down.

Q. Yes.

A. And clearly that is partly what this Inquiry is about. It's to address that.

Q. Entirely, not partly.

A. It goes a little bit beyond that.

Q. Of course the reason why we are looking into a water safety plan at all is because we are all looking into the future; right? Of course, it wasn't there in the past, so we hope they will come up with a good one, but as you said, they have not even got the people together. That's the problem.

A. I would agree that's a problem and we've had a lot of discussion this morning, or a lot of exchange this morning, about that particular issue. I have said that there should be much closer liaison between the various departments. There's got to be much more involvement of different stakeholders. And that particularly becomes important when you reach a situation where there is a multiple involvement in the responsibility for delivering safe water, and within buildings you have multiple responsibilities. So it is really important that they get together.

That is somewhere where I think that the consumers in those affected buildings have been let down. You can't expect them to know that they have contamination

in the water when you can't see it.

Q. Yes, of course. Of course the people who ought to be there, the Customer Services Branch, won't even see you?

A. It wasn't that they wouldn't see me, it was just that --

Q. It was just an accident?

A. I was seeing a number of people. I had a day and a half, basically, in total. A lot of that time was spent with the task force, the task force members, and members -- people from HD, and I couldn't see them.

I agree that if they had really wanted to, they could have asked to see me.

Q. They could even be lining up outside court to see you at 5 o'clock?

A. I hope not. I'm planning on going back.

DR WONG: Mr Chairman, we would be most happy with that.

MR LEE: Good. That's good news.

You mention rightly that our licensed plumbers' status is not perhaps as good as it should be?

A. That is my perception and my concern.

Q. Do you know how long it would take to train one of them

to be licensed?

A. I think it's about -- it's months rather than years, and that is not unreasonable.

Q. So I don't think, therefore, it is reasonable, at least for our purposes as to who should be responsible for the quality of the drinking water, and so on, to look at them as if they were professional people, like doctors, engineers, architects or lawyers, in the context of Hong Kong?

CHAIRMAN: I'm do sorry, what's your question?

MR LEE: It won't be right to look at the status of these licensed plumbers and put them in the same status as other professionals?

CHAIRMAN: Why not?

MR LEE: If they were trained in a few months.

CHAIRMAN: No, no. We know as a matter of fact that they now have to go through a three-year craft certificate.

A. Yes, before they can --

CHAIRMAN: Before they practise, for another four years -- no, incorrect. They can actually then go on to take another course, to qualify themselves as a licensed

plumber.

So we are not talking about months. We are talking about years, actually.

MR LEE: What about the older plumbers?

CHAIRMAN: For the older ones, there's no formal qualification at all.

MR LEE: And some of them are grandfathers.

CHAIRMAN: Yes.

MR LEE: Do you know that they have no -- at least some of them can't even decide what materials could be bought? Sometimes, they are bought for them?

CHAIRMAN: If you believe them.

MR LEE: Yes, if you believe them.

A. Well, that is -- within what we have talked about and what we know about the role of a licensed plumber, that doesn't fit very well with their roles.

But that isn't something that then becomes their responsibility. It means that others are not fulfilling their responsibilities properly.

Q. Okay.

CHAIRMAN: Can I ask you, Professor -- because you talk about skeleton WSD WSP. What exactly, because I have

read those WSPs myself too -- well, on the face of those documents, it seems they are quite sort of comprehensive to me.

A. The detail is very limited.

CHAIRMAN: Right.

A. It's like so many things, the devil is in the detail, and one of the things -- you cannot put into a single plan -- almost invariably, these things are living documents, so you've got a framework, you've got the skeleton that you can hang everything else on. That's very important.

The skeleton is interesting, but the detail, as I have said in places in my statement, is not so obvious. How they operate the distribution system is not so clear from this, because that would involve a level of detail, explaining what processes are there to deal with planning out, have they got GIS maps of the distribution system, how do they operate valves, do they have records of whether valves are closed or open, all of these things. And you can't put everything onto the skeleton. The skeleton has a lot of flesh that's

attached to it, and that's important.

I haven't had -- it's impossible in the time frame to walk through the details of the water safety plan. When I was helping Northern Ireland to do their water safety plans, there were two of us working with them, and we were involved for six months, more than six months.

So it requires a lot of the detail, and the detail in the different treatment works, the different catchments, and so on, means that there's a lot of detail in there.

Now, I know that there is a lot more detail in different places, but you don't put them all in the one plan. The danger is always that if, as happens with some, where the consultant has prepared the water safety plan for the water supplier, and it comes as a volume, and it goes on to the managers, often the chief executive's shelf so he can show it off and nobody looks at it, and that is not what a water safety plan is about. A lot of the water suppliers in the UK, fortunately, have computer systems. You've got the

different steps and different plans. You have operating procedures. All of those are part of the water safety plan.

MR LEE: Professor, you just mentioned about your experience in Ireland, both you and your colleague, and it took six months. But did you have all the stakeholders together, working with you?

A. We had not all of them at that stage. We hadn't been through all of them. We had been through a number of the stakeholders. And the water supplier -- it's a publicly owned water supplier -- was still trying to get to grips with the part of the plan that was going to look at buildings, because there were a lot of different stakeholders that needed to be involved. They knew some of the things and they had had dealings with their public -- the consumer department, who wanted to be trained. They were trained in what a water safety plan was about, so they knew about that. But they knew that a water safety plan would not be in the same form as the water safety plan for the treatment works and the

distribution system. It's going to have various bits.

But the plan would involve a lot of different stakeholders, and those stakeholders will vary, according to the circumstances that you are in. The level of detail in the plan will depend on whether you can access buildings, what sort of regulations are in place to support that.

In Hong Kong, you have a number of those steps for the water safety plan. The piece that's been missing is that implementation, the level of that implementation. It should have been very straightforward but, like in so many things, when nothing has happened -- I'm reading a book at the moment where they say, "We had a hurricane in 1910 but we never have hurricanes here", and that sort of reasoning, "It hasn't happened for ages so why would it happen again?" -- that sort of thinking is something that creeps in. It's not something that's a conscious thought. It's an unconscious thought, and it involves everybody.

Q. The hurricane is an act of God?

A. No, I think it's an act of physical and meteorological conditions.

Q. People abusing the earth?

A. I don't think so. Hurricanes have been around for a rather long time.

Q. More so than before, I suppose?

A. There's some doubt about that.

Q. I don't want to enter into an argument with you, because you know about all these things; I don't.

But tell me this. So who should take the initiating step to get people together, so they can begin to look at all these things with a view to coming up with a good water safety plan?

A. My feeling is that it should be the WSD?

Q. The WSD?

A. Because they already know about water safety plans. So I would say that it is incumbent upon them to pull together the various groups.

Q. And the first one, who should be ready and nearby would be the Housing people, because it's in another government department?

A. Yes.

Q. And it's the owner of so many public housing blocks, housing more than 2 million people; do you know that?

A. Yes, I knew that.

Q. Of course, when you come to individual owners of flats, there may be more problems, but there's nothing to stop them from getting on first with this one; right?

A. I've been saying this over the last two days: there is a need for a building management manual, and that -- where you would start with a building management manual is with the public housing blocks, because the Housing Department is effectively the landlord, and it is therefore simpler to deal with that because you have fewer stakeholders, and you can use that as a basis for others.

That should have happened. But again, that's 20/20 hindsight. The reason that it will happen now is because there is now an increased sense of urgency because it is now understood within Hong Kong that there is this need, whereas it was not understood that there was a need for it because there were systems in place.

Q. Yes.

A. And it was assumed that those systems that were in place would actually deal with the problem.

Q. And of course, looking back with hindsight, if there had been a water safety plan and people had been looking at it and following it, so warning themselves of the possibility of this sort of thing happening, do you think this could have been prevented?

A. I think it would have been considerably less likely, because it focused the mind. I'm not going to say that it couldn't possibly happen. You can't ever say that something will always be prevented, because it depends what goes wrong. But the process would have been highlighted, that a proper water safety plan of that type means you are taking it seriously; you have checks in there, you have processes that are about making sure what you have in place works. And we talked about verification.

Q. Yes.

A. Verification that the system is working properly and the barriers are there.

Q. And taking water samples?

A. Not necessarily. Not necessarily. The illustration that I made earlier, for your colleague, was about a well and you have animals accessing the well. That's a danger, that's a hazard, and so you fence it off and you check that the gate is closed, et cetera. So it can be inspections, it can be making sure that certain things have been done. It isn't necessarily all about water samples.

And water safety --

Q. You don't exclude it, though, do you?

A. I don't exclude it but Water Safety Plans is not always about water samples. In fact, water safety plans is helping to get away from the thinking that is we take samples at the end of pipes, because the problem with that sort of thinking is that you start to rely on a very few samples to check whether something is there.

Now, this is not entirely desirable. You should be preventing -- it's after the event. The whole point about a water safety plan, it's not supposed to be checking things entirely after the -- this is a last

resort. So the water sampling really is a final, last-resort check. You should have picked that up before that point.

Q. Like what? By doing what?

A. By making sure that the various procedures that you are supposed to be following are actually being followed; that the correct solders are being provided; that the plumbers and the engineers, everybody, understands why that's happening, and so on. So there's a lot of steps before the water sampling.

As it turns out, I'm not convinced that the sampling method would have helped particularly, except that there were a number that came out above the then considered WHO guideline value.

So you should be preventing that. The problem with finding out after the event is it's too late.

Q. In other words, other stakeholders could have known about this, are you saying?

A. Oh yes. I think there's a number of stakeholders involved, and the problem was that, to an extent -- and I said this yesterday -- it sort of fell between the

cracks.

Q. Again, for instance, if people were to go to the site, the building site, and actually examine the materials, solder, test it, see whether it contains lead or not -- now, if they do that, again they can only take samples, in a way? You can't be there all the time?

A. No, but you can take a series of steps that will emphasise that certain things should be used and that certain things are there. The proposal, for example, now is that there perhaps should be central purchasing of items like solder. That means you have a store of them there. It's much more difficult to use the wrong material.

The training side is very important.

Q. It's more expensive than the solder with lead?

A. It is more expensive. That's the problem we have had in

the UK, that it's more expensive. The DIY plumbers go in and buy the cheapest and it's not the right way to do

it. You have to work hard to make sure they use the correct materials and the level of training and

supervision has to go all the way down to the people actually doing the soldering itself.

Q. So are you suggesting then, Professor, that if all the stakeholders were to be involved in this, under, for instance, a proper water safety plan, and they all did their job, as it were --

A. Yes.

Q. -- then this sort of thing ought not to have happened?

A. I would argue it ought not to have happened anyway, but yes, I would agree with that.

Q. I'm interested, why do you say "anyway"?

A. The procedures, the requirements were in place, and they should have been followed, and if they had been followed, this would not have happened.

Q. Yes. If the presumption is that people would do what is expected of them all the time, then I suppose a lot of civil servants would just be complacent and assume, therefore nothing would happen?

A. It's not just civil servants. I think this is --

Q. Fair enough; including you and me too.

A. It is a fact of life. People tend to be like that, and

unfortunately, unless you have a very clear understanding of why you are doing things, then people tend to forget how important small things are.

Q. But the trouble is, as you put it -- I mean, assuming here we have very good document, or maybe a series of good documents, and if people don't read it and don't talk about and discuss it, then it's still no use?

A. That's correct, but then it's not a water safety plan anymore. A water safety plan has got procedures and requirements, and you have to have checks in that those procedures are being followed.

Q. And meetings?

A. Well, meetings will be in there. There will be a whole range of different things.

But it's not just a document. If nobody is reading it, it ain't a water safety plan.

Q. It requires good plan and a lot of people who always warn themselves that anything can happen and therefore you must be prepared?

A. Yes. That's what we try -- one of the things we try and teach is to ask outrageous questions, "what if", and

sometimes we ask outrageous questions and the answer we get is silence and then panic.

Q. And of course you ought to make sure there's a culture among these people, all these stakeholders, that whatever can go wrong will go wrong?

A. Yes, and that's why you try and prevent it. That is -- one of the points about water safety plan, or water safety planning as a principle is there is a significant culture change within that, and it does direct the culture.

Q. That is the most difficult part, isn't it?

A. It is, and it takes time. It obviously takes time.

Q. This expression -- I got it from my learned friend Mr Ho -- when you ask people to fix their eyes on the ball, and if -- you should fix your eyes on the ball, even though it is put there at the corner, before it is kicked, you should place your eye on the ball, not when the ball comes near to you, and that's the difficulty?

A. As a keen watcher of football, I can tell you that people take their eyes off the ball even when it is very close!

Q. That's what I told my son, when you want to head the ball, you must watch the ball all the time.

A. Absolutely, and it's the same with everything else. With water, if you become complacent and start cutting corners, that's when things go horribly wrong, and there are lots and lots of examples that I'm not going to give you here because we haven't got time.

Q. You are in a hurry to go home tomorrow?

A. I have to go home tomorrow evening, but it's quite late.

Q. Don't worry.

A. It's delightful sitting here in the room, but --

Q. Don't make it more delightful for me, otherwise I may change my mind!

Occasionally, when you have a particle with lead in it, which gets into the water, and then it's tested, and then you see some abnormal rise; right? I mean, you have seen this chart; I won't show this again to you. Should the sample be discarded?

A. No. It is a signal that something is wrong. You may want to go and re-take a sample. You may want to re-examine. But it shouldn't be just discarded.

I was trying to pick that up before, and one of the key mantras that I certainly have and I try and bring to water suppliers is, if you are taking samples and you are going to disregard the results, what's the point of taking samples.

Q. Exactly.

A. So you need to consider it.

Q. If you are working for the Waterworks Department, then you don't like the sample, that doesn't mean you can just --

A. That's one reason I suggested that having a water quality manager would be a benefit, because it takes that person out from the pressures, and I know that there are significant pressures on the operational people. Running a water supply of any size is not an easy thing to do, and it requires a great deal of skill and dedication. So there will be pressures, and having somebody who's outside that, who will say, "I don't care whether you think that is a problem with the laboratory, we are not going to ignore it, we are

going to check it out, we are going to do something about it."

Q. So you want an independent person to do it?

A. Yes. It's helpful, within the organisation, not an external regulator, but somebody within the organisation who doesn't have the same operational pressures.

Q. Okay. Is there any way to find out where a particle of that type might have come from? Can you use this method, isotopic method, to find out?

A. No, it's very difficult. It will tell you that it could have come from originally the lead, if we are looking at lead. It could tell you that the lead has probably originated from solder, but you would need to have enough of a sample, and a single particle is going to be too small an amount.

With particles, particles are quite a common phenomenon with regard to lead in water, and they create a certain amount of concern, particularly amongst consumers. But it's the average exposure over a period.

So the original provisional tolerable weekly intake -- and I know that we don't have a health-based standard anymore -- but the idea was that instead of having a tolerable daily intake, the provisional tolerable weekly intake actually indicated more clearly that it was exposure -- it would even out over a period. It's not the peaks like that (demonstrating), it's the average exposure over a period of time that becomes important.

So, in terms of particles, if you are picking those up, then in exposure terms it's still going to be the average over time. So it's not something that necessarily requires that you should be any more concerned about, but it does require that the water -- whoever is responsible for that plumbing system is aware of the presence of those particles, and the approach that you take to ameliorating the problem, that should be taken into account when you are doing that.

Q. I take it that there is no longer, as far as the WHO is concerned, a health-based level, is there?

A. That's correct.

Q. And the 10 micrograms per litre is a decision-based

guideline -- I think yesterday you said that, or an intervention action level?

A. Yes. It's a level below which you are trying to achieve. You should be trying to achieve to get as low as possible. 10 micrograms is what we know with extensive systems, where there's lots of lead, we know you can get down to 10 fairly readily, using a treatment with orthophosphate.

Q. And you said for Hong Kong it could be half?

A. I think for Hong Kong you ought to be aiming at a lower value, simply because you do not have that basis of considerable levels of lead, service connections, lead piping, and so on.

Q. Indeed, the water in our mains has practically no lead?

A. That's correct.

Q. Do you know how low it is?

A. It's less than a microgram. Most of the time it's below detection.

Q. Below detection. So in theory, then, if I turn on my tap and have my water tested, and if it has 2 micrograms per litre, then already there's something wrong with the

internal system?

A. Not necessarily. We don't have a very good background, and that's something that needs to be looked at, as to what the contribution will be. There will be a small

contribution from fittings that do meet the British Standard, because there will be some lead there.

Q. It would be very low, wouldn't it?

A. It will be very low. It may well be below detection, but I would like to see some data. It indicates that -- certainly at 5, that would allow you to say -- it may be

that Hong Kong, with the data that it can generate as a consequence of this incident, will be able to say, "We are going to set our standard at 2".

Q. That's exactly what I want you to say.

A. It's up then to Hong Kong, and they should set standards based on their particular circumstances, and if your circumstances are that you can maintain a very low concentration and it's not a problem, then you should set your standard at that lower level, because you shouldn't be allowing the water supply to deteriorate

unnecessarily.

Q. And there is no reason for Hong Kong, because our water from the mains is so low as far as lead content is concerned, not really to set it low?

A. And more than that, you don't have lead service connections, you don't have unplasticised PVC pipe that's got lead stabiliser. All of these things are in place that you don't have. Therefore, you could have a very low standard.

It would have to be above detection, clearly, because sometimes you are going to find traces of lead. It's not a consideration particularly.

Q. After all, it is a standard set by the government to aspire to, really?

A. I'm not so keen on setting standards to aspire to. I'm more keen on saying that these are standards that we can achieve, and if we can achieve it, a good standard, then we should have that, and we are not going to allow the water to deteriorate, to make it worse.

Q. Okay.

A. For aspiration, the way that it's been done in a number

of places is that you have a particular standard and you say, "The standard is 25 micrograms per litre now; in 10 years' time it will be 10 micrograms per litre", and that then provides a target.

It needs to be more than aspirational. There are aspirational targets for other substances in some other countries, and the trouble is that they are effectively political, and then when you get an exceedance of that particular standard, you have a problem, because the interpretation becomes very difficult.

Q. I stand corrected on having used the word "aspired to", because Hong Kong doesn't have to aspire to 5.

A. It's already got it.

Q. It's already there. That's why, why don't we bring it down?

A. You don't have a standard. That's the point. You don't have any standards.

Q. At the moment our water people are using 10.

A. Because they work to the WHO Guidelines. My point with my report is that the guidelines are not supposed to be used that way. Therefore, it would be helpful to the

Water Supplies Department, and everybody else, if you had Hong Kong standards. It wouldn't be the long list of guidelines that they have, it would be smaller than that and it would be relevant ones, but you could set the standard at what would be appropriate, and it could be 2.

Q. It could be 2?

A. For lead, it could be 2. It could be.

Q. That's the answer I wanted, because we have already got it, actually.

A. Absolutely. I have no problem with that. It's just logical that that would be the way forward.

Q. I will move on to another point. You gave some evidence on orthophosphate dosing.

CHAIRMAN: Before you ask your next question, I think there is a problem with the LiveNote. I think they have to fix the LiveNote, so let us, say, adjourn for a ten-minute coffee break.

MR LEE: I won't be too long.

(3.39 pm)

(A short adjournment)

(3.52 pm)

MR LEE: Mr Chairman.

Professor, I think you can fly away tonight, unless something terrible happens.

A. I'm not flying tonight. I'm flying tomorrow night. I may be frying tonight.

Q. So would you rather that I give you until tomorrow morning? I shan't be long.

Professor, you mentioned something about orthophosphate dosing.

A. Yes.

Q. You said that if you put it into water, in the mains, you don't think you could bring down the lead content to 10 micrograms per litre?

A. In a normal system that we have in the UK and elsewhere, where there are extensive lead pipes, it is difficult to get universally below 10 micrograms per litre, with dosing with orthophosphate, without removal of lead pipe.

Q. Okay, so you have to remove the lead pipe, ultimately?

A. Yes, that's the objective.

In the situation in Hong Kong -- I'm a bit nervous about proposing remedial measures -- clearly, remedial measures are in place, in that the lead is being removed and replaced. But one way, under other circumstances, if you had had a lot of old lead in the system, in a similar way, so that the lead solder or lead connections had been put in place a long time ago, one way might be to dose orthophosphate at the entry to the buildings, because once you start dosing with it, you've got to keep on dosing.

So that would be one way to reduce lead problems.

You have an alternative, and the alternative is in many respects a lot better, because it's actually removal of the lead. Then you've just got to make sure that when there are repairs, you don't put any more back in.

Q. But using orthophosphate dosing, it could produce -- normally also produces the effect of forming, inside the pipe, an inner tube?

A. How do you mean?

Q. There's a coating. Do you know about that technique?

A. Yes. A coating? It's -- a chemical reaction takes place between the lead and the phosphate, to form lead phosphate, which is highly insoluble. When you get that layer -- as the lead is coming out, as it is dissolving in the water, it reacts with the phosphate, it forms lead phosphate, which is insoluble, and that deposits as a layer over the surface and reduces the potential for further -- it doesn't entirely stop it, but it reduces the leaching of lead.

Q. Does it mean that you don't need to replace the pipes, because then the inner coating would protect the water from the lead?

A. That is what is used to get the lead level down to about 10 micrograms per litre. You don't replace the pipes under those circumstances, but you have to keep on dosing the orthophosphate. It's not something you dose it and then you stop, because if you stop dosing then that layer starts to break away.

Q. I see.

A. So once you start, that's it.

Q. I could be wrong, but I'm told that this sort of technique is used pretty -- a lot in Germany, for example; are you aware of that?

A. You are coming to a particular brand.

Q. I won't mention it.

A. I've had emails from the people concerned. Orthophosphate dosing is used widely across the world. It's not just Germany. This is not a German invention. It has been used very widely, it is very commonly used and it is well-established.

Q. So it's used in the States, and in England too?

A. Yes, extensively, and in Scotland, Wales, all of these places. It's used in different parts of Europe where they have lead problems. So it is a well-established technique.

Q. Thank you. I haven't mentioned the brand name. You haven't either.

A. No. I did have an email from them.

Q. Me too!

Now I'm going to ask you some questions about BS EN. Could you please tell us what EN -- European norms, is

it?

A. Yes.

Q. How is it related to BS standards?

A. There are a whole range of standards organisations, and there's a certain amount of co-ordination between those standards organisations, so some will adopt other standards.

My suggestion for Hong Kong is that they don't completely restrict themselves to the British Standards; that they accept materials of equivalent standards, equivalent approvals. So that would provide a little bit of flexibility.

So there are a range of different standards, different approval schemes, that in many respects are very similar, and to an extent they are interchangeable. There may be details of difference. In Europe, we have current discussions going on in developing a European-wide materials testing and acceptance scheme. That has never happened, which is rather odd, in a market -- what's supposed to be a market like that. The stumbling point has been, for a number of years,

details in the different schemes that are available. There are four main schemes, four main countries.

Q. The four member states, you are talking about?

A. There's four of the member states have very good systems, and there's equivalence between them. So all of these, and with the different standards -- there could be a whole range of equivalent standards.

Q. You see, in the laws of Hong Kong, the British Standards are adopted.

A. I know.

Q. But sometimes we get BS EN and then a number, sometimes just BS and a number. What is the difference between these?

A. There isn't much difference between them.

Q. No difference?

A. I'm not familiar with the detail of the difference between them. I don't get involved in that, if I can avoid it.

Q. But the four MS is Great Britain, France, Germany and the Netherlands?

A. Yes.

Q. And what's happening?

A. There was a meeting --

Q. I know you were involved.

A. Yes. There was a meeting held in May of last year, a two-day meeting -- there have been various attempts to get this adopted by the European Commission -- there was a two-day meeting at which I gave the keynote lecture and then chaired the second day and gave a summary at the end. The Commission have agreed, under a certain amount of pressure, to start talking about it again, which I'm rather disappointed about and so are the member states.

In the meantime, those four members states have been negotiating and have come up with what is basically a common approach between them. That common approach, it is anticipated, would form the basis of the European acceptance scheme.

Q. So the four member states, as far as they are concerned, they have agreed already?

A. Yes.

Q. I'm asking you this because, you know, there are various

groups of people working with us, and they like this. It's a forward step, isn't it?

A. That's the idea, that it will become formalised. At the moment, it is informal between the four.

I've got to be a little bit careful here -- I have been publicly very critical of the Commission for not doing it. It is because -- funnily enough, you should be familiar with that here -- one department wants the responsibility, but won't do anything; the other department wants to do something but doesn't have the responsibility, and the consequence is that we have stalemate, or have had. It would be of benefit for Hong Kong if that happened, because I think it would be much more widely adopted around the world, and it provides an opportunity for much more flexibility in where you can source materials, and so on, from.

Q. So, since this saga has woken people up, and I think -- I understand your evidence is this is a good opportunity, therefore, for us to get together?

A. Absolutely.

Q. And to go forward from here?

A. This has got to be the best opportunity that you could have. Everybody's awake, everybody is aware, and it will be a case of putting aside departmental differences, trying to keep the politicians out.

Q. What about lawyers?

A. And deliver something that's really constructive and based on good sound practice and good sound science.

Q. You will keep the lawyers? We certainly need one judge.

A. The judges are first rate. The lawyers can be a little dodgy!

Q. We want one judge. We don't want the Court of Appeal! Okay.

What about legislation? You are familiar with the legal framework in Hong Kong?

A. Yes.

Q. And it's pretty old-fashioned stuff --

A. Indeed.

Q. -- and it needs a lot of updating, do you think?

A. I think that's exactly right and I've made some recommendations in that respect. I think there needs to be much clearer delineation of the responsibilities of

the different departments. I've said time and time again, I think there should be standards and a regulator. I'm a great believer in an independent regulator, and WHO are very keen -- and we mention it in many places within the guidelines -- that an independent regulator and standards that are tailored to the particular country are a beneficial way of going forward.

An independent regulator, because that removes a lot of the potential pressures.

And for standards, because you have to think about them, and thinking about things is really a very important exercise. Understanding which of the contaminants, apart from microbiology -- the pathogens are always important -- but amongst the chemicals, understanding which ones are really important, which ones need to be monitored at what rate, how you monitor them, how regularly you monitor them, how often you have to do checks.

We have introduced risk-based monitoring in Europe

now. We modified annex 2 of the Directive. That allows member states who introduce water safety plans -- that gives them a basis, because they have hazard assessment and risk assessment, to be able to say, "We have got a supply here, we've got two or three contaminants here that are in the Directive but which we don't see at anywhere near the standard levels; we don't need to monitor these as regularly as laid down in the Directive." So they can justify infrequent monitoring.

That focuses the resources on the things that are important. The advantage of focusing resources on things that are important is that you don't get lots and lots and lots of zeros. When you get masses of zeros, it's easy to lose what's important in that. And it gets away from a practice which is unfortunately very common in many parts of the world, partly introduced by some of the analytical results recording systems, where it only reports a result, flags it up, when there's a failure, and I can't see the point of doing monitoring only to measure failure. You should be using all of the data.

There's a huge investment, and using all of that data and understanding the trends, et cetera, is an important part of the process.

This is an opportunity for Hong Kong. You've come to a point where this can be introduced into the regulation, improving the regulation, looking to the future, and the future is going to get tougher and tougher for everybody in terms of water and water supply and water resources, et cetera. Populations are going up. Resources need to be conserved. So we need to be much more focused. And this is a real opportunity, I think, for Hong Kong to look to the future, put in place a legislative and regulatory framework that will help them to be able to focus on the important things and deliver first-class water.

Q. Does it help to have water safety legislation? A lot of countries have it.

A. I think that's really important. I think that's really important. How complex that legislation is I think is something to be discussed. I'm in favour of as simple

as possible. That's a good thing.

Q. Which model is simple and good?

A. That's a very big question.

Q. No, a very short question.

A. I'm not quite sure what I would recommend. I wouldn't necessarily recommend going down the route that we've gone in the UK. I think that's very complex, and there's reasons for it.

I think that Hong Kong is well capable of looking at its own requirements, what it needs, and developing its own regulations, and regulatory framework and legislative framework to go with that.

Q. Am I right that the sort of problem that you have been looking into also takes place in drinking water coming from hot water dispensers, so people can turn on the -- a huge tank of hot water, in some Chinese restaurants, that sort of thing?

A. Well, there can be issues. It therefore needs to be considered under regulation. But any water dispenser needs to be considered appropriately.

In fact, we do mention this in the guidelines, in chapter 6, that there are a whole range of things. We

don't cover everything, because the hot water dispensers are something that tends to be uniquely associated with Chinese culture. But there are lots of other things where there are problems -- there are places where the water is delivered in tankers, in streets, and so on, and all of that needs to be considered.

I think in Hong Kong, covering water in containers of various types, it makes sense to have some regulation, in order that that's not exploited. We've seen that happen elsewhere, where very poor-quality water has been delivered.

I was involved in a case, actually in the UK, where a company, prior to the current regulations, were bottling a water and really not very well, and they were storing it in conditions which were inappropriate. It was very warm, and so on. And the microbiology count was equivalent to raw Thames water, and I wouldn't recommend drinking it. It may not do you any harm, but I don't think I would want to try it.

So I think any of these need to be properly regulated and thought about. There may be difficulties

because sometimes you run into cultural norms that might not want to change, and so on. But it needs to be addressed, because public safety of drinking water, any form of drinking water, is important.

Q. When we talk about legislation, I suppose there ought to

be criminal sanctions for offenders?

A. Not necessarily.

Q. What about fines?

A. Could be. It just depends. It depends what suits Hong Kong. In the UK, we have criminal sanctions --

Q. But not imprisonment? I don't think it's imprisonment. Just fines, isn't it?

A. Potentially, under certain circumstances, it's possible.

It's never happened. But there is the potential for that, for a water company. If a water company boss is negligent in delivering water, they could effectively go

to prison. It's unlikely to happen, partly because it certainly focuses the mind if you think that you might get that sort of sanction. But whether it's criminal or

whether it's civil or whatever, I think it's whatever suits the jurisdiction that you are dealing with.

They don't have criminal sanctions in most of the European countries. It's a different regulatory system.

I don't recommend one way or another. I think it's got to be what suits Hong Kong.

Q. I'm going to ask you just a very few questions on a topic on which you have been asked a lot of questions on already, and that's water samples, taking water samples.

I have read your preliminary report as well as your own report. I think it's pretty obvious that you do not agree that first samples or overnight samples should not be taken?

A. That's right.

Q. Because, according to the WHO, the ISO 5667, it depends on the purpose of testing the water?

A. Yes. I have to say, I do get concerned that in Hong Kong everybody seems to look outside at various international standards, et cetera, when actually a little bit of thought, instead of looking at those

standards, would be rather better. It's quite clear that -- you are right -- you define the purpose of the sampling, and then you design the sampling to achieve that purpose.

In the case of looking at the impact of metals -- in this case we are talking particularly metals, it doesn't have to be metals, it can be materials from plastic or whatever -- coming from the distribution system, the best way at the moment seems to be to take samples, either first draw in the morning, or the other alternative is to take random samples. If it's a new property, then it's no problem in setting it up to take a first-draw sample that's been in contact overnight. That's not a problem. If you have lots and lots of apartments that are full of people, it becomes a lot more onerous and more difficult for all those people. So random daytime sampling may be more appropriate. And that is to identify the presence of those metals.

Q. So your opinion on this -- you are quite firm on this, first draw should be taken, for our purposes?

A. I think on the new buildings, on the new flats, that if

you are sampling to see if there is -- this is your verification that lead has not been used -- then yes, I think it should be after an overnight stagnation period, then first-draw -- it depends how much you are going to take. One of the reasons that Prof Lee did what he did was because that helps to inform how big a sample would be necessary to get the information. I was a little concerned that there was a lot of discussion with him, missing the purpose of what we did. We did not do it to assess risk or anything like that. What we wanted to do was to do some checks on the levels that had been seen, and also to help it inform the design of an appropriate sampling method for Hong Kong. And we have that, and it would imply that a 1-litre sample taken after overnight standing would fulfil the purpose in the new flats or in any new flats, as a verification.

Q. The model that Prof Lee worked on, I think, after discussing with you, was to have five samples, 0 seconds and then 20, 40 --

A. No. That's not the proposal for the overall sampling.

That was the way that we did it, in order to make sure we caught the peak. That could be just by taking a full 1-litre sample. We demonstrated that the 1-litre sample would probably capture what we needed.

Q. I think the result of all this testing, and so on, will I think satisfy you that in fact it's not necessarily the first 20 seconds, from 0 to 20; more often than not, it's the next one where you find the maximum?

A. When you look at the structure, you will see that the leaded solder joints are actually further up. If you are looking at another metal, antimony springs to mind, then you would want that very first sample, because the antimony is coming from the tap, and if you were looking at chromium, although you tend not to see chromium very much, chromium would also be coming from the chromium plating on the tap. So that would be the first -- that very short period.

That helps in terms of also looking at how people use it. Asking somebody to turn the tap on for 5 or 10 seconds makes life a lot easier than asking them to flush it for five minutes.

Q. Even two minutes is a long time.

A. Yes. I did this at home the other day, and two minutes -- and when you are standing waiting for it, it seems a lot longer as well. My fear about the flushing -- it's dealt with, so it's not a problem. If it was a long-term solution, my concern would be that people would start to revert to taking first-draw water because it's inconvenient.

Q. Now that you've got experience of the results of the five samples, in fact do you agree that if there were two -- just take the first two -- then I think a lot of lead would have gone by then; right?

A. Well, if you flush it for any length of time, and you are pulling through the water that's in the down pipe, then because the contact time between that water and the lead is so short, you would not expect to see significant concentrations of lead.

Q. After the first two --

A. Well, after the first two to whatever minutes. It will depend on the apartment.

Q. So I suppose you would like the Water Supplies Department from now on, if they have come up with

another similar thing, then they should test first draw, they must test first draw?

A. It depends what they are going to be doing, but if they are looking for lead in the plumbing, then that would be the appropriate way forward, but they would need to think very carefully because they are looking at antimony and chromium and other things as well. But if they take first draw, it's not an unreasonable position to be in.

Q. I will end with my last question: do you drink water from the tap?

A. Of course, and in Hong Kong.

Q. And in Hong Kong. But back home?

A. Yes, all the time.

Q. Thank you.

A. I can't afford all that bottled water you have got.

Re-examination by MR SHIEH

(All questions in English)

MR SHIEH: Just a few clarification questions. The first question is really a point of correction. Can I ask you

to look at your report at paragraph 6?

A. Yes.

Q. Six lines from the top, you mention "new properties in Wales".

A. Yes.

Q. The year you stated there is 2001. It should be 2007.

A. Yes.

Q. So you would change that to 2007?

A. Yes.

Q. Next, during your questioning, and I think it permeates the entirety of your evidence, the system in place in many other jurisdictions --

A. Regulatory?

Q. The regulatory system in place, or the background in a lot of overseas jurisdictions is that they still have leaded water pipes, and so it is impractical to replace those types wholesale?

A. That's right.

Q. So the remedial measure of using orthophosphate had to be resorted to?

A. Yes.

Q. A document was produced by Mr Chan Kin Man in the course of his evidence. Could I ask you to look at it. It's bundle C21, page 19045, tab 182.

A. Yes.

Q. It is a Journal of Water and Health; you have heard of it?

A. Yes, I am familiar with this.

Q. The authors of this article --

A. I am familiar with the authors.

Q. You are familiar with the authors? Yes.

At page 19046, over the page, the second column, it says:

"Lead pipes are considered to be the major source of lead in drinking water in the UK (although lead from other sources is possible, notably lead leaching from brass and solder containing lead) and lead pipes have been the focus of corrective action. This contrasts with the view of the WHO in their recent booklet ..." Et cetera.

That's the background. The sentence I want to direct your attention to is the next one:

"Whilst the removal of all lead pipes is the ultimate goal, the very high cost (about [GPB]10 billion in the UK), problems with split ownership, likely long time scales ... prompted a national strategy for corrective action by water treatment measures as the logical first step to take."

Does that really reflect or encapsulate the message that you have been --

A. Yes, absolutely, and it's a very similar situation in the United States.

Q. Thank you. Then I have a series of questions which we would like to seek your clarification on. It arises -- the series of questions arises out of answers you have given this morning.

Could I ask you to look at the transcript for this morning, [draft] pages 54 to 55, so just scroll back up.

A. I'm still on the paper.

CHAIRMAN: He can't see.

MR SHIEH: You have it?

At the bottom of [draft] page 54, there's an answer at line 18 -- well, it starts at [draft] line 10, where

I think it was Mr Ho asked you:

"But then the question is, first, why was this not done before the incident came to surface; or, if it wasn't done, should it have been done before 2015 ...", et cetera.

Do you see that series of questions? Then you mention, "It is very easy to use 20/20 hindsight".

Have you found it?

CHAIRMAN: He can't see.

MR SHIEH: You cannot see? You mean it has disconnected?

[Draft] Pages 54 to 55.

[Draft] Page 54, at the bottom, around about near line number 10, you can see the question:

"But then the question is, first, why was this not done ..."

Can you see that question?

A. Yes.

Q. "But then the question is, first, why was this not done before the incident came to surface; or, if it wasn't done, should it have been done before 2015 ...", et cetera.

Then the answer you gave was:

"It's very easy to use 20/20 hindsight --

Question: Absolutely.

Answer: -- and say that this should have happened.

In discussion between both HD and WSD, it was clear that they believed that the procedures that they had put in place to prevent the use of lead were working efficiently, therefore suggesting that there would be additional and quite complicated steps at that time, without having the knowledge of what's happened since, I think would have been showing a level of foresight that might be regarded as quite spectacularly good.

Question: Sorry, you say, if one were to require, I say WSD first, to actually have that degree of foresight, in fact you say it's spectacular?

Answer: Barriers have been put in place to prevent the use of lead, and to suggest that WSD should have recognised the fact that there was a good chance that Housing Department would not enforce the conditions or were not able to enforce the conditions of the contract is asking a lot, I would say.

Since it has happened, clearly there are

circumstances that both departments have been -- feel that they have been caught out and let down. There were other parties who clearly did not fulfil their part in the process. So I think at that time it would have been unreasonable to expect that they would have then gone and checked. It would have been, to an extent, saying that another department is incompetent and therefore we are going to double-check on them, and that's not easy to do."

You see that series of questions and answers?

A. And that garbled response from me, yes.

Q. We get the feel of what you were saying. When you refer to, "Barriers have been put in place to prevent the use of lead", I take it you are referring to at least the legal, the contractual requirement?

A. Yes.

Q. Both in the Housing Authority context and the building context. In the water context, we have the Waterworks Regulations requiring adherence to British Standards; so these are the barriers you refer to, right?

A. Absolutely.

Q. When you say they have been let down, or "there were other parties who clearly did not fulfil their part in the process", you are referring to people like licensed plumbers who you suggest the primary responsibility should fall?

A. Yes.

Q. I suppose you would also include people like plumbing contractors --

A. Yes.

Q. -- to a lesser extent, although they are labourers and you would count mostly the licensed plumber?

A. That's right.

Q. The Commission obviously does not set out to condemn or criticise for the sake of criticising. The Commission has wide-ranging terms of reference. We are both forward-looking and at the same time backward-looking. We know factually probably what happened. In terms of attributing blame, not that blame must be attributed, and this is something that we seek your assistance. Reasonableness would be an objective test. The

Commissioners will obviously take their own view. You mention it would be unreasonable to expect them to have gone and checked, because it would be really for one department to say, "I don't trust that your department have done your job"?

A. The checking we were talking about was actually doing water sampling.

Q. I see.

A. So, at that time, the water -- the WSD and to an extent HD had put in place reasonable barriers, as you would under water safety plans, put in those barriers and if those barriers operated, you simply wouldn't have a problem.

So doing verification monitoring at the tap would be an additional step which, at that stage, they might not reasonably have expected was necessary.

Q. I see. So when you say -- that is the point I wish to seek your clarification on, because when you say "it would have been unreasonable to expect that they would have then gone and checked", the "gone and checked" --

A. Was taking water samples.

Q. You mean taking sampling at the ultimate stop?

A. Yes. At that time, they had put in place appropriate barriers, and they could -- if those barriers were working and the checks that were supposed to be in place with plumbers showing which materials they were going to use, et cetera, et cetera, if that had been followed through, then there would have been no need for further verification monitoring by taking water samples.

Q. So, in a way, I don't want to put words into your mouth -- not that you are likely to have words put into your mouth -- but if any fault is to be attributed, you would not regard the lack of testing at the tap as the ultimate point --

A. No.

Q. -- the something that you would regard as unreasonable?

A. I think to say that that was to blame is unreasonable, because the whole process is designed or should be designed to prevent this occurring in the first place. If you find it at the tap, it's too late; you have a problem.

Q. Whether any omission at an earlier point in time to do any checking is blameworthy is another matter?

A. That's totally separate.

Q. You have expressed your views and can I just -- I won't read it out in detail again, but can I ask you to look, for example, at your paragraph 47. I won't use the word "blame" but deserving of comment, let me put it in a neutral way. Whether one would elevate it to a question of blame would obviously be a matter of submissions to the Commission.

In terms of comment on various omissions at various stages, your paragraph 47 and 48 respectively commented from the perspective of WSD and also the Housing Authority. Your paragraph 47 commented on -- for example, two-thirds down the paragraph, there's a sentence about "none of the responsible parties carried out the basic checks". These are all commenting on the stage prior to the final testing of the tap which didn't take place?

A. Absolutely.

Q. These are checks which could, arguably should, have been done, let's say by licensed plumbers or at the

contractual stage by Housing people, et cetera. I won't go through them in detail.

A. Yes.

Q. That's correct, right? At paragraphs 47 and 48, you are commenting on various chances before the final stage of connecting the pipes?

A. There are whole stages of opportunities to prevent what happened.

Q. Thank you. I have got that clear now.

It then leads to paragraph 66. Again, a comment on missed opportunity, "the clearly stated requirement that only unleaded solder must be used should have raised questions", et cetera. Again, that is a comment you make about missed opportunity?

A. Absolutely.

Q. There is one point -- it may not be a big point -- on which I would like to seek your clarification. It has been raised by others, WSD's responsibility for water quality ending at the point at which water enters the building.

Now, whether or not in future there should be some

kind of a mandatory scheme or system, as a safety valve, to check the tap upon completion of a building, or even routine checks at taps after tenants have moved in is a matter for debate.

A. Yes.

Q. But at the moment, in Hong Kong, there are constraints, because the current statutory regime doesn't actually allow the Water Supplies Department to randomly say to a tenant, "Can I come in and test your tap?"

A. Yes. It's purely a voluntary system.

Q. That is the difference between Hong Kong and some other systems that you have seen?

A. Yes. It varies. There are similarities. There are countries in Europe who don't have the same right of access.

Q. Some systems do legislate for --

A. Oh, yes.

Q. -- coercive entry?

A. I wouldn't use the word "coercive" but they have a right of entry to take samples.

Q. Right of entry for the purpose of testing, yes.

A. It doesn't mean that they can turn around and say, "You need to be in when we call". Far from it. It's arranged. But there are other countries, France for example, where socially it is not very acceptable, and so that will not happen.

Q. But all you need, if the will is there to provide for or to introduce a scheme whereby the authorities could have a right to enter for the purpose of testing would simply be some legislative amendment?

A. That's correct, and that can be put in various ways so that it's not seen as particularly coercive.

Q. Thank you. Let me just check.

One last point. Paragraph 47. I think it's a point that Mr Ho raised with you. There is a sentence which says:

"If staff in the HA are unaware or unsure why a contractual requirement is included then this should be rectified before the contract is let."

A. Yes.

Q. By "rectified", I think -- what do you mean by

"rectified"?

A. I mean they should understand why and they should go out of their way to find out why.

Q. The reason they need to know why before the contract is let -- well, to let the contract simply means to conclude a contract, to grant a contract to a particular contractor?

A. Absolutely.

Q. The reason is because if you don't know the rationale behind a clause, you can't actually design schemes to monitor compliance with that particular clause, to prioritise monitoring?

A. That's right, and you are not in a position to be able to ensure that the contractor himself, itself, has in place the appropriate steps.

MR SHIEH: Thank you very much, Prof Fawell. I have no more questions for you. You can relax and sit back and return home. As an avid football watcher, I wish your team good luck, except for 2 April this year.

WITNESS: I realise that.

CHAIRMAN: Prof Fawell, on behalf of the people of

Hong Kong, may I express our sincere thanks to you for your assistance in this Inquiry, both in terms of preparation of the two reports and also in testifying in these proceedings.

With the co-operation of our politicians, hopefully on your next visit to Hong Kong you can see some of your recommendations being adopted and implemented here, and that we have better and safer drinking water.

Thank you very much.

WITNESS: Thank you very much indeed.

CHAIRMAN: Do you wish to say something, Mr Lee?

No. He is no longer a politician; he becomes a dodgy lawyer!

Thank you.

MR SHIEH: (Via interpreter) Mr Chairman, may I report something to you? For tomorrow, the WSD has informed us that they are going to call their expert witness, Mr Kan. After that, the WSD is not going to call another witness. Their expert has submitted a preliminary expert witness report.

Then we will go back to the witnesses of fact from the WSD. We are going to issue a formal timetable in relation to the order, including Mr Wong Chung Leung and Mr Leung Wing Lim; in other words, those that we have scheduled earlier on. So they will follow Mr Kan, the expert, on Monday.

CHAIRMAN: (Via interpreter) So, for tomorrow, would you want to have it at 9.30 or 10 o'clock?

DR WONG: (Via interpreter) It depends on how much time Mr Paul Shieh needs.

MR SHIEH: (Via interpreter) It won't be long.

DR WONG: (Via interpreter) Then 10.00.

MR LEE: (Via interpreter) If we can finish in the morning, 9.30 for me.

CHAIRMAN: (Via interpreter) All right. Make it 9.30.

For next Monday, we start at 11 o'clock, because of some personal engagement.

All right. See you tomorrow. Thank you.

(4.41 pm)

(The hearing adjourned until 9.30 am the following day)

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