SCOTTISH HOSPITALS INQUIRY

# Hearings Commencing
# 19 August 2024

Day 4
Thursday, 22 August 2024
Ian Powrie

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**10:03**

**THE CHAIR:** Good morning. Now, yesterday we had difficulty displaying documents. I understand that that problem may have been fixed. Always just a little bit tentative when it comes to technology. All being well, we should be able to display documents. However, I think to help legal representatives, we have distributed a list of the documents that Mr Connal anticipates referring to today. It may not be a comprehensive list, but the attempt has been made to give as much notice to legal representatives as may be. Now, Mr Connal.

**MR CONNAL:** Good morning, my Lord. There is one witness scheduled for today, Mr Ian Powrie.

**THE CHAIR:** Good morning, Mr Powrie.

**THE WITNESS:** Good morning.

**THE CHAIR:** Now, as you understand, you are about to be asked questions by Mr Connal, who I think you may have met and is sitting opposite you, but first, I understand you are prepared to take the oath.

**THE WITNESS:** Yes.

**THE CHAIR:** Just sit where you are, raise your right hand, and repeat these words after me.



**Mr Ian Powrie**

**Sworn**

**THE CHAIR:** Thank you. Now, I anticipate you will be giving evidence over the course of the day. We usually take a coffee break about half past 11, so there will be a break in the course of the morning, but if at any stage you want to take a break for whatever reason at all, just give me an indication and we can take that break.

**THE WITNESS:** Thank you.

**THE CHAIR:** Now, Mr Connal.

**Questioned by Mr Connal KC**

**Q** Thank you, my Lord. Well, good morning, Mr Powrie. I think you produced a statement in response to questions from the Inquiry.

**A** Yes.

**Q** And you have access to that statement. Is that correct?

**A** Yes.

**Q** And are you content to adopt that statement as your evidence at this Inquiry?

**A** Yes.

**Q** Thank you very much. Mr Powrie, just before we start in the formal questions, I am conscious that you have been retired - we will get the date just a

minute - but for about five years now.

**A** That's correct.

**Q** If at any time I ask you a question that you do not know the answer to for some reason, please just tell me and tell me what the reason is, and if I ask you a question that you do not remember, you are free to simply indicate that to me if that is your answer to the question. Otherwise, in your statement, Mr Powrie, you set out your various qualifications and so forth. Originally, perhaps, focused on the electrical world rather than other areas of Estate management. Is that correct?

**A** Yes. That's correct.

**Q** I will just ask you a general question at this point, which has been suggested to me. Thinking back now, do you think it would have been helpful to you as an Estate manager to have had more training in matters relating to Infection Control?

**A** Yes, I think it would.

**Q** Thank you. Again, just so we understand the sequence of appointments that you had, essentially your time that is relevant to us, as I understand it, splits into three and we can find this on page 3 of your statement, 210 of the electronic version. So, you have a project role - this is at answer 3 near the top - you have a project role between August 2012 and September 2015 - we will come to that in a second - and then you become a sector estates manager and that runs until January 2017?

**A** Yes.

**Q** When you become, I think, Mr Alan Gallacher's deputy?

**A** That's correct.

**Q** In a wider role within the board, is that correct?

**A** Yes

**Q** And you stay with the board until July 2019----

**A** That's correct.

**Q** -- when you retire. Is that correct?

**A** Yes.

**Q** Thank you very much. This one point on 211, just on the top paragraph, because at one point later you said in your statement something along the lines that, "Well, at one point I was reporting to three different managers."

**A** Yes.

**Q** So, I thought I would just ask you about this here. You seem to say here you reported to Alan - that is Alan Gallacher, presumably - on technical matters, Billy Hunter, operational, and David Loudon on issues relating to defects, broadly speaking.

**A** Yes.

**Q** Is that correct?

**A** That's correct.

**Q** Is that what you meant by the

three different lines?

**A** Yes.

**Q** Thank you very much. I only really have one question about your project role because you deal with that at 212, the next page of your statement, at the foot of the page, and you explain some of the things you were doing, particularly about your role as the authorised person for high voltage.

**A** Yes.

**Q** Obviously, an electrical role and some other things, but the one thing you mentioned there was you were developing a strategic maintenance manpower plan.

**A** Yes.

**Q** So, that was actually something you were asked to do? It was not just something you did?

**A** Yes. David Loudon asked me to develop that, yes.

**Q** David Loudon asked you to develop it?

**A** Yes.

**Q** Thank you, and we get some more relevant dates, perhaps, on 214. In the answer 10, when you give us-- confirm your retirement date, and you were deputising for Alan Gallacher, supporting your successor in the Estates role and then you had a particular role in what's been described as the "water incident".

**A** Yes.

**Q** Which is in 2018, we have-- we know.

**A** That's correct.

**Q** Thank you. Now, one of the issues I am keen to get from you, Mr Powrie, is the issue of staffing because, as we will see later in statement, you explained some of the consequences of staffing issues as matters proceeded. Still on 214, the second half of the page, you are asked, "Well, when did you start to have questions about staffing?" Am I right in understanding, the gist was that you had worked out how many people, on a calculated method, that you thought you needed?

**A** Yes.

**Q** And, I think, later in your statement you give that number as, I think, 111.

**A** That's-- yes, round about there, yes.

**Q** Round about there? I think the way these things are expressed in your statement, you talk about numbers "WTE".

**A** Whole time equivalent.

**Q** Whole time equivalent?

**A** Yes.

**Q** Right. So, that could be two part-timers for one full-time, or something, yes?

**A** Yes. Yes. It's unusual for part

time, but yes.

**Q** Yes, okay. So, it's whole time equivalent staff numbers?

**A** Yes.

**Q** And that is what you reckoned, and were you told you could have 111 people?

**A** No. From recollection, the paper was submitted to David Loudon, who then took that to the board, I believe, particularly Robert Calderwood.

**Q** Mr Calderwood, I think, was the chief executive of the board at the time.

**A** Yes. Yes.

**Q** Thank you.

**A** And the feedback I got from David was that Robert Calderwood had advised that the board was working to the Outline Business Case finance structure for Estates and that the budget stated in the Outline Business Case was fixed. So we had to go back and rework the budget to align with that.

**Q** Did that mean you ended up with 110 of your 111 or a lot less?

**A** No. I think, from memory, we ended up down around about 68.

**Q** Right.

**A** And that's including management and supervisory staff.

**Q** Yes.

**THE CHAIR:** This is my fault, I think, probably for not paying close enough attention. When you were asked about your estimate of your requirements as being at 111 full time equivalent, could I just check what time we are talking about and for what responsibility we are talking about?

**A** Well, the time frame that was I think submitted around about 2014.

**Q** 2014?

**A** And in terms of-- I'm not sure what you mean, in terms of----

**Q** We have identified your responsibility on the project board.

**A** Yes.

**Q** Is this 111 Estates personnel for what is now referred to as the Queen Elizabeth campus or is it a larger area or a smaller area?

**A** It was for the Queen Elizabeth campus, but taking into account the retained-- what we called the retained estate----

**Q** Yes.

**A** -- so that was the old property that was to remain on the campus, as well as the Queen Elizabeth Adults', Children's, laboratory medicine, energy centre, and as I say, retained estate.

**Q** Right. Thank you. Sorry, Mr Connal.

**MR CONNAL:** Not at all, my Lord. So, do you happen to know the gap between what you had worked out you reckon you needed and what you were

told you could have? First of all, was there a point at which you had to lose posts even from what you had selected?

**A** From the 68?

**Q** Yes.

**A** Yes. Well, there was, for the-- after we went operational, I think for the first year, possibly two years – I can't quite recall the time frame for that – the staffing levels were protected against any-- what they call CRES savings.

**Q** Right.

**A** So that was cash releasing efficiency savings.

**Q** "Cash releasing" – this is just for the notes – "cash releasing efficiency savings"?

**A** Yes, and that----

**Q** Okay. So they were protected for a while?

**A** I would say a year to two years. It would either be a year or two years, I just can't remember the actual time frame.

**Q** Yes.

**A** But then we had to fall back in line with the programme for annual efficiency savings and I believe we lost two whole time equivalents on, say, the second year in relation to our contribution to the CRES savings.

**Q** Thank you. I was just thinking, and if you do not know the answer to this, please just say so. I mean, the gap between what you had calculated and what you were told you could have, did anyone, to your knowledge, do some kind of risk assessment on what the consequences would be of constraining the staff numbers in that way?

**A** No, and just for clarity, the 68, I wasn't told that that's what I could have. I worked with a finance manager----

**Q** Sure.

**A** -- to align the available budget to what was affordable. In fact, that's what we called it, the affordability model.

**Q** If we just look at the top of the next page, 215, in the electronic bundle, page 8 in the statement, I think you are describing there what happened in January 2017 or thereabouts when you handed over to someone else in your role?

**A** Yes.

**Q** And he did his own calculation of what he thought he needed?

**A** Yes.

**Q** And you have recorded here that he thought he needed about 108, which is roundabout----

**A** Yes. That's correct.

**Q** -- yes, similar. Thank you very much. I am going to come back to that in a minute, but I will just ask you one more general question first. The role that you took on in 2017, that was as a deputy to Alan Gallacher, and I do not think there is

any controversy about this, you were simply given his job description and said, "Help me with that." That is probably what happened?

**A** Yes, yes.

**Q** Well, that is fine. I do not need to ask you about that because we have got Mr Gallacher's job description----

**A** Okay.

**Q** -- for another reason. And at that point, when you sort of moved out of your estates, I think you described that you were working more on major projects?

**A** Yes.

**Q** Is that right?

**A** Yes. For the first period of time, I was kind of mopping up ongoing issues within the Queen Elizabeth. So I was dealing with issues of outstanding with departments and snags, problems, etc., and then I think the next thing I was involved with as a project entity was the cladding issue in relation to Grenfell.

**Q** Yes, and just for reference, we find you explaining that on 217 at the first main answer there, where you list a number of things that you were involved in.

**A** Yes.

**Q** And I will not take you back to back, but moving to the point where you have-- you have been told you cannot have all the staff you asked for, you have tried to work out how many you can fit within the budget. You have started, in January 2015, to be responsible for the building once it was handed over?

**A** Yes.

**Q** How did the staff numbers impact on working conditions for you and your team?

**A** Well, in January 2015, we didn't even have that because these were all staff that had to be redeployed from the demitting sites. So until those sites were closed, the staff for the Queen Elizabeth weren't made available. So at that time in January 2015, I had five staff who were all managers who were re-deployed in a pre-opening, but not long before the opening.

**Q** Yes, and did you subsequently gather together the rest of the numbers?

**A** Yes, as the sites decanted and then the limiting sites were decommissioned, the staff started to come across. It wasn't on a single transfer date; it was fed over a period of time.

**Q** Yes, and did this have an impact on how long you and your team had to work in terms of hours?

**A** Yes, in terms of-- at point of handover, the volume of work that was to be done in relation to ongoing construction issues, commissioning for the occupation, and the problems that

were arising with the building. Personally, I was working 14 hour days, seven days a week, and the staff that were working with me weren't quite working as long, but they were certainly working longer hours.

**Q** Thank you. I will just pick up on a couple of these points at page 219 of-- I am using the electronic numbers at the top of the page, Mr Powrie, just for ease. If you look at the middle of the page there, you say you were concerned about the workload and you are talking about things such as the pneumatic transport system.

**A** Yes.

**Q** Now, I think that was a system designed to allow things like samples to be sent from one location in the hospital to another in a kind of pneumatic tube?

**A** Yes. Yes.

**Q** Was that something that was causing problems at the time?

**A** It was causing major disruption to the clinical service and the system was actually breaking down or canisters were getting lost or trapped in the system, transfer stations were locking up, because that-- there was major, major issues trying to keep that going and it was having an adverse impact on clinical service, A&E waiting times, etc., and it was a high pressure issue from a clinical perspective to keep it online.

**Q** Now, please correct me if I am wrong, but am I right in thinking that the reason that it was having a clinical impact is it was often used for sending samples for analysis or testing or something like that so that somebody could get results quickly?

**A** Yes. Yes, the laboratory building is remote from the ward building, and in order to streamline that process, the system was installed. But when it broke down, we didn't have the portering staff to be able to transfer the samples the way they would have been in the past. So it had a big impact on speed of turnaround.

**Q** The other thing that you mentioned, and we will just get it out so we know what it is, you AGVs, is that automatic guided vehicle?

**A** That's correct, yes.

**Q** Which are little sort of mini robots that move around----

**A** Yes.

**Q** -- the hospital from place to place, and were they also causing issues at that time?

**A** Well, they weren't commissioned at the point of handover, they were commissioned just prior to occupation and there were issues with that as well in terms of software, the automatic guidance system, those various things in relation to the

breakdown of the service. On top of that, we didn't have a service support contract in place because the manufacturer had been taken over by another company and had to re-evaluate their service offering before they could offer a contract. So we were actually dealing with a-- now with a reduced service from the manufacturer.

**Q** Now, as the estate manager, this issue of not having enough people must have been burning to you, was it not?

**A** Yes, absolutely. I mean, to be honest, in terms of those issues, I was personally having to deal those. The pneumatic tube system, that would generally fail after hours or just as the-- the end of the day so I was staying on to get these things sorted out and keep them going.

**Q** Yes.

**A** And to an extent, I was the only person that had any training on the PTS system so it generally fell to me to try and get the thing back into service. Although, I did have some support from the other team that I had on site.

**Q** Sure. Yes. I think you mentioned on that page Mr Brattey and Mr Purdon as two of that team.

**A** Yes.

**Q** I mean, did you try to complain, protest? Find out if it could be made better?

**A** Yeah, I did highlight the pressures but they were just expected to get on with it and do what needed to be done.

**Q** Is that the response that you got?

**A** Yes.

**Q** Thank you. Another issue that I want to take you to, which is not unconnected to the first one, I have entitled it "Firefighting," which I think is probably a phrase that you recognise.

**A** Yes.

**Q** You touch on that on 220, and just before I look at that, because you have provided a whole list of things as examples of what you were having to do at the time.

**A** Yes.

**Q** Is that because you were not simply sort of getting on with routine maintenance, there was other stuff happening as well?

**A** Yes. We had stuff happening on retained estate, there was issues happening once I became responsible for the wider sector, including Clyde. There were issues happening in those sites as well that I was having to manage.

**Q** You have provided a list of different things here and I do not think I need to take you through all of it because we can read it for ourselves, but just in the general sense, were the things that

cropped up things that tended to take quite a lot of time to sort out?

**A** Yes, and they tended to extend over long periods of time. There weren't instant solutions. It took time to get things settled down and working as they should.

**Q** Right. So if we took the first bullet point on 220 under the small-- sorry, the large A, you are talking about blockage causing-- blockages causing sewage discharges into wards----

**A** Yes.

**Q** -- but that was not evident until you had people in the wards?

**A** Yes, to be fair, it mainly affected the-- well, there was two issues there. There was one where there were blockages on the risers that the wards fed into----

**Q** Right.

**A** -- and then there was blockages on the sewer lines underground, external to the building. So the underground ones caused impact on A&E in both Adults and Children's and the risers caused impact on generally wards in various areas, particularly the Children's.

**Q** And that that impact was stuff getting discharged?

**A** Yes, well, it's sewage being discharged into the ward, on the floors, coming up through sinks, wash and basins, etc.

**Q** Further on that page, you deal with the AGVs and you deal with the pneumatic system, which I do not think I need to ask you about again. So we go on to 221, where your list continues. I might just ask you about the LTHW push-fit connections.

**A** Yes.

**Q** What was happening with them?

**A** These were connectors that-- in all areas there were either batteries or chilled beams. So, these either give cooling or heating into the discrete area. They're connected to the chilled water system and the LTHW system with flexible connections on what they call push-fit connectors.

**Q** So, is that what it means?

**A** Yes.

**Q** You just push them together and they----

**A** You've got your spigot on the battery and you push-fit the connection onto the spigot and then it holds itself in place, and you have two connections for each battery, one flow, one return.

**Q** And what happened?

**A** Well, what happened there was, the pressure for these push-fit connections was higher than the connectors were designed for. So, they were tending to blow off and then flood

the area, affected by the fact the connector had blown off.

**Q** Was this one connector that blew off or was it----

**A** There was multiple. It was happening across the site, to the extent that Multiplex had to go round and change all of the push-fit connectors.

**Q** So, these were everywhere on the site, were they?

**A** Yes.

**Q** Right. So, were you getting flooding in lots of areas?

**A** Yes. So, apart from, obviously, the loss of service itself-- I mean, to be fair, this all happened before Occupation, but apart from the loss of the heating or cooling system, we also had the damage that that caused to rectify. Now, when I'm saying "we", we had to manage it, but Brookfield were responsible for repairing or replacing any damaged materials.

**Q** Yes. Well, you have given us a very long list, and we probably do not have time to go through them all. Can we just look at page 222? You mention there-- because I think it has cropped up in statements that the Inquiry has heard from others about what you have described as "interstitial window blind failures".

**A** Yes.

**Q** Now, that is a window blind which is contained within panes of glass, is it?

**A** That's correct, yes.

**Q** And that allows you to open and shut the blind?

**A** Yes.

**Q** And were these causing problems?

**A** There was no problem with the blind itself. What was wrong was they had an external wand, as it was called, and that connected on a flexible connection at the top of the window onto the blind, and the wand was rotated left or right to open or close the blind.

The difficulty was that these wands were detachable and patients, staff, didn't know how to use them properly and invariably were breaking the connection, and that was a whole task to get back into that to repair these connections.

So, that was seen as a user issue by Multiplex rather than a defect, and I had to come up with a redesign solution to go around and replace those on all the windows.

**THE CHAIR:** Could I ask a question, going back to the push-fit connections? It is just my ignorance revealing. You used the expression, “Heating and cooling batteries.”

**A** Yes.

**Q** Now, what does “battery” mean in that context?

**A** It's like a radiator fin-- coil radiator, similar to a car----

**Q** Yes

**A** -- where you've got tubes that run through fins, and the fins are used to disperse heat or cooling.

**Q** So, it is a component within the chilled beam?

**A** Yes.

**Q** Yes. It is just that "the battery" suggests electricity.

**A** Yes, I understand.

**Q** Yes. I am with you now.

Thank you. Sorry, Mr Connal.

**MR CONNAL:** Let me just ask you about another one, because I am conscious that you have said, "Well, this is stuff I can remember, but it is not exhaustive."

**A** Yes.

**Q** About halfway down 222, there is reference to en-suite shower flooring issues. Again, I think the Inquiry has had some evidence from others about this topic, where you have noted:

"Water not running to drain. Multiplex insisted this was due to the client's instruction to remove the shower curtains."

**A** Yes.

**Q** How does that work? I am not quite sure I am understanding that.

**A** I wasn't quite sure either. The problem was that the floors weren't graded properly for the water in-- This is a wet room. It's not just a shower, it's a wet room. So, it's got the WC, wash hand basin, and a shower in it, and the floor should be graded to fall to drain, so that any water that's dispersed from the shower runs to drain. The floors weren't graded effectively enough to achieve that.

Now, when that was raised, Multiplex tried various options to do something to actually achieve that without redoing the whole thing, none of which were really successful, but prior to contract handover, there was a request from Infection Control to remove shower curtains from the design because they seen shower curtains as an infection risk. Invariably, they get wet and mould develops on them, so they wanted to remove that as a risk. That was relayed to Multiplex and the shower curtains were removed.

Basically when I say removed, not installed. They were never there. So, when we started having this problem, Multiplex's view was that the shower curtains would have retained the water in the area where the drain was, and therefore the removal of the shower curtains allowed the water to now extend beyond the boundary of the shower, and therefore that's why it wasn't running to drain.

**THE CHAIR:** I mean, I think it will

be obvious to everybody, but what we are talking about are we rooms----

**A** Yes.

**THE CHAIR:** -- which are associated with bedrooms because you have a single----

**A** Yes.

**THE CHAIR:** The policy is, patients accommodated, generally speaking, in single rooms, and patients will have a wet room available as an en-suite.

**A** Yes, it's dedicated en-suite to each bedroom, yes.

**Q** Right, and did this problem arise in all the levels of the hospital?

**A** It was fairly universal. It wasn't all rooms, but there were multiple-- there was a high number of rooms that were affected by it.

**Q** Right, and that would include level 2 and Ward 2A?

**A** And the Children's. It would include that, but I can't remember specific instances of it.

**Q** Right, thank you.

**MR CONNAL:** Thank you very much. You produced this list, which is no doubt very helpful to us, Mr Powrie. Is this the kind of thing you were expecting to have to deal with?

**A** Yes.

**Q** All this kind of firefighting?

**A** Yes, yes. These were fairly routine types of issues that we had to deal with.

**Q** Right. Now, in the next sections of your report-- of your statement, you deal with training and other issues which I do not need to ask you about. Can I just ask you a general question, though, that comes from that? In terms of commissioning the water system or commissioning and validating the ventilation system, were you involved in either of these processes?

**A** No.

**Q** Thank you. Were you involved in anything involving the design of the hospital?

**A** No. I was-- A chap called Brian Gillespie, he was a Sector Estates manager from Clyde at the time. This would be back 2006/2007. We were asked to meet with the Shadow Design team. So, that's the people that put together the outline spec for the contract, and that was with a view to adding operational experience into the design requirements. So, they were looking at electrical distribution systems, giving a feel for what operational issues would maybe arise from that, but that was the only input that I had in relation to design. I didn't----

**Q** That would be because, at that stage, your primary focus as part of the project side was on electrical matters.

**A** Well, I was still an operational

Estates manager at that time for the Northeast of the city, so I wasn't part of the Project team then. So, it was basically only to get a perspective of design issues and improvements that could be made to the operational side of things.

**Q** Okay. I would like to move on to 232, which is page 25 on the original numbering, and to the foot of that page. I probably do not need to take you to documents for this, Mr Powrie, with a bit of luck, but I think you were asked about something called the ZBP Ventilation Strategy----

**A** Yes.

**Q** -- and you said you only saw it when concerns started to be raised about air change rates. Is that correct?

**A** Yes.

**Q** Had you been consulted about it or knew about it before then?

**A** No, no. I wasn't part of the Project team in 2009 when that was proposed. I found out about it-- In fact, I didn't find out about it when I asked the question initially. When I asked the question initially about the air change rates not being as per guidance, I was referred to the-- I can't remember the name of the----

**Q** The clarification log?

**A** The clarification log, yes. So, I read the clarification log and it just said it had been proposed to change the design of the air change rate in relation to chilled beams being adopted, and that this was approved, and in fact I think the control strategy for that was to be for slightly negative pressure in the rooms to be achieved and an extra amount was paid to achieve that.

**Q** I have jumped ahead a little of my page numbering, so just so we are clear where you cover this, on 233, original page 26, what you explain in the large paragraph with the letter "A" against it was that what drew you to this issue was that questions were raised by Infection Control.

**A** Yes.

**Q** And then you were supporting Dr Peters and you found what the air change rate was and so on, and you thought there was a problem, and then you were told, "Well, it is all in the clarification log."

**A** Yes.

**Q** And then people asked more questions, and then you referred to that ventilation strategy.

**A** Yes.

**Q** So, that is how you came to know about it?

**A** Yes. It wasn't shared right away, it was shared after two or three iterations of questions.

**Q** Thank you. Now, the next

topic that I would like to take from you, because we have got-- you have told us about the impact of not having enough people, you have told us about the impact of having to firefight a whole range of stuff that had cropped up. I want to ask you about the effectiveness of what I might call the-- I was about to call it the "paperwork", although people will now tell me it is all online so I should not call it paperwork anymore, but you know what I mean, management systems to assist you as an Estates manager to do your job. We will end up talking about, I think, three things. One is Zutec, which I will come back to. The other is something called CAMF.

**A** CAFM, yes.

**Q** Have I got that right? CAFM?

**A** Yes.

**Q** Thank you very much. The other is something called asset tagging.

**A** Yes.

**Q** So, I am going to ask you about these, just so we understand what was happening. You touch on this, I think-- Let me just you though, first of all Zutec: what is Zutec as far as you understood it?

**A** Zutec is a document management system. So similar to, say, the paperwork. So, all of what they call post-commissioning documentation should have been loaded onto Zutec and



that would be our reference to all matters. Design, installation, commissioning etc. should all be contained within that documentation for future reference, and if there's modifications to be made to allow that to be built upon.

**Q** Yes. We have heard a little about Zutec from other witnesses. Can I just ask you, generally, was Zutec easy to use?

**A** No. I mean, in principle it's a simple register, a menu of documents, and you should be able to penetrate that menu to find the relevant information you're looking for. So, if it was ventilation, you would expect to go through environmental ventilation, air handling unit, chilled beam, and find the topic you're looking for. It wasn't as simple as that.

Invariably, you'd be looking for something for ventilation, and it would be in a different folder altogether for a different topic. The information wasn't always in Zutec. You had to go and ask for it to be made available, and it just was very difficult to navigate. Am I right in thinking that it was not available on day one-- it was not available until several months later?

**A** Yeah----

**Q** The two-month period. Is that right?

**A** Yes. Point of hand over, we

were expecting to be able to learn and get information that we needed for various tasks that were to be performed, and I was advised that Zutec-- by Multiplex-- I think it was David Wilson-- advised me that they had a two month grace period from contract completion for the full population of Zutec, and that was verified by the Project team.

**Q** Yes. So it was not operational immediately, and then it was difficult to use when you got to it?

**A** Yes.

**Q** Now, I think you deal with that - and I need not take you back there - at page 235, and then you go on, on 236, to talk again about Zutec, and then we then touch on CAFM.

**A** Yes.

**Q** So, just help us to understand what CAFM was supposed to be.

**A** Well, that's a Computer Aided Facilities Management software package.

**Q** So that is not just a register of documents?

**A** No. The idea of that is that all the processes and the PPM work schedules, etc. that are required to manage the building would be programmed into the system, and it would rescheduled in the system, and that schedule would be adaptable to meet the resources available from the Estates team. So, for example, if we had 200 PPM that were due to be carried out next week, and we only had 10 staff, we could reorganise that so that we could have enough work for 10 staff and then the rest would be rescheduled for the following week automatically or for a time period automatically. That's not the way it worked in Zutec at all.

**Q** Well, let me just go back one step just so we are clear. We probably all know what it is, but I will just check. PPM is Planned Preventative Maintenance?

**A** Correct.

**Q** From an Estate's perspective, is that an important part of your job?

**A** Yes. That's the maintenance programme that would be carried out on any item to make sure it was still performing correctly, that there was no faults on it, that it was safe, that it didn't need any consumables replaced. That kind of thing.

**Q** Yes. So, you could not use Zutec to do this process?

**A** Zutec-- According to Multiplex, Zutec had a PPM system installed on it but what it was in reality was a list of tasks. So, there would maybe be, say, a number of jobs put in as PPMs, and each job would have a schedule of items that needed to be addressed based on manufacturer's recommendations but there was no way to-- other than manually print it out, but there was no

way to schedule that or programme it or feed it back to verify it had been complete. It just wasn't a working system. It was just like a document-- a register of documents.

**THE CHAIR:** I think I have picked up a distinction between a dynamic digital programme, and I do not know what the opposite is, but let us say static.

**A** Yes.

**Q** And Zutec is a static system. In other words, it holds information as at a particular moment of time.

**A** Yes.

**Q** But it is not designed to take in more information or manipulate that information in any way?

**A** Correct. Yeah.

**MR CONNAL:** So, the idea of a CAFM system is that a lot of it happens within the system itself, and it would come out and say, "You have to do X or Y today or next week" or whenever it is.

**A** Yes. You----

**Q** I am oversimplifying but----

**A** Yeah. You still need someone to manage that and put the right information in to get the right information out but basically it performs a lot more tasks and it links into other facilities type software to allow you to perform other tasks.

**Q** Now, I think I am right in saying that the actual system, the actual CFM system, was the board's system, but what the contractor was meant to do was to put all the necessary material onto that system.

**A** Yes. At the time of contract-- and that was one of the issues that Brian Gillespie and I had fed into the outline design spec. At that time, we had just omitted from trusts back to a board, and we were looking to harmonise the CAFM systems across all the sites. At the time the contract was being put together we hadn't done that yet but we had two systems identified that we were possibly going to adopt, and we had named those, and the contract required Multiplex to adopt the preferred system and populate it with the PPM and asset tag data for the Queen Elizabeth as it was handed over. From there, I provide the hardware that was required to run that.

So that would be like a barcode, QR code readers, that kind of thing, to allow us to automate the process so that where an asset tag was applied, it would have a code on it, and we'd be able to verify that asset was the right asset that we were going to work on. That was all part and parcel of the contract.

**Q** Yes. Well, let me ask you two questions. If you do not have a fully populated facilities management system, does it make your job as Estates manager more difficult?

**A** It makes it pretty impossible, yeah.

**Q** Pretty impossible in what way?

**A** The fact that we then have to manually process all the PPM, and in fact that's if we appreciate what all the PPM is because we might not be aware of items or plant that require servicing etc., and therefore it's not impossible to retrospectively-- without a dedicated team to develop it, they retrospectively go back and identify all the requirements.

**Q** Well, you deal with some of this in your statement. Can I just ask you generally: how long was it, can you remember, until you actually had an operational facilities management system of the kind that you thought you were supposed to have?

**A** I don't believe that was in place by the time I retired. It was being worked on, and I had done a lot of work to convert the information that was provided by Multiplex onto a platform that could be migrated into the CAFM system but, equally, the PPM that was developed along with that by Multiplex didn't take into account all the aspects that were required. Again the contract required that the PPM should cover manufacturer's recommendations, mandatory and statutory recommend-- requirements. Multiplex had only provided manufacturers recommended PPM. So the mandatory and statutory PPM wasn't there.

So, from the board's point of view, we were looking at adopting a system called SFG 20 which was an industry standard PPM system that gave you the ability to take into account all three elements.

**Q** Thank you. I apologise in advance, Mr Powrie, if my questions jump around a bit, but it is just the way they are laid out in your statement, and the easiest thing to do is to take that order. In January 2015, when the first handover took place of the site, what was the state of the Children's hospital?

**A** It was incomplete. There was still construction works outstanding within the building. I think it was breaches between the-- construction breaches between the Children's and the theater suite. Ventilation wasn't complete. It was still a construction site, in effect.

**Q** This point is maybe fairly obvious but on 238, which is 31 of the original numbering, you explain another task that fell to the Estates team, which involved about 200 plus – let us just call them Multiplex people, because it does not matter whether they are Multiplex or subcontractors or whoever – turning up and having to be-- their interaction with the building having to be managed by you and your team.

**A** So, in effect, what we had to do there is we had to have an access register and ID badge system so that we knew who was authorised to be on site and who wasn't. For each task that the contractors were coming back on site to do, we had to review the method statements and risk assessments, and approve those or go back and ask for clarifications or reworking to suit our requirements. In effect, we became the building owners and responsible for the activity on the site. So contractors had to be vetted and processed by our team.

**Q** Let me turn on to another topic, if I can, because it comes next in the order of your statement. 239. You are asked about commissioning of the water system, and commissioning and validation of the ventilation system, and what you saw at the point of handover, and you make the point that you could not see anything for a couple of months because Zutec was not available. Did you see commissioning and validation reports at that stage?

**A** I've seen parts of them. To be honest, I couldn't tell whether they were commissioning data or validation data. It was just-- It was all classed as commissioning. There was no distinction. So, for water, for example, I saw some records of the the sanitisation process. In fact, I had advised that the sanitisation process, in principle, should be approved prior to being carried out by the Infection Control doctor.

**Q** Is that the point you make at the foot of 239 of your statement? That is Professor Williams at the time.

**A** Yes. So-- yeah, Professor Williams was the lead Infection Control manager for the department, and he was actually working with the Project team on the new build compliance for Infection Control. So, I got the proposed methodology for sanitisation of the water system, shared it with Professor Williams, who approved that. So, in principle, once he's approved that, he should also then witness the testing as well. I don't know that he did do that, but he did sanction the test protocol, and then all the test results were shared with Professor Williams, and their iterations because some of them were outwith the required limits and had to be resanitised and be tested to the point where Professor Williams was satisfied that the system was deemed fit for use.

**Q** Thank you.

**THE CHAIR:** Mr Powrie, can you help me on this? You have been referred to the bottom of 239. Where does the requirement for a disinfection method statement and, if I have followed what you have said, the results of testing come from?

**A** That would be the SHTM-- I think it's 03 for water.

**Q** 04----

**A** Possibly.

**Q** Right. So, the source of that obligation is SHTM 04?

**A** Yeah.

**Q** Right. Thank you.

**MR CONNAL:** On the next page, you have been asked about, "What is the difference between commissioning and validation?" and you are quoting, I think on that page, from SHTM 03-01----

**A** Yes.

**Q** -- about ventilation, and you set out there what I think is a quotation directly from the document.

**A** It is.

**Q** When you say that:

"The system will be acceptable to the client at the time of the validation. It is considered fit for purpose and only requires routine maintenance."

Who does the validation?

**A** Well, the validation should be an independent specialist contractor who validates all the components of the system are working together as they should----

**Q** Would report to what? To the board?

**A** Well, ultimately the board would need the results, but I think in this case the validation should have been carried out by Multiplex and approved by the board.

**Q** Approved by the board.

**A** Because----

**THE CHAIR:** Sorry, I maybe did not hear the answer. You were talking about ventilation at the moment, and you draw attention to the provisions of SHTM 03-01, and that has a requirement for, as you said, independent validation.

**A** Yes.

**Q** Now, validation by Multiplex does not sound to me independent, with great respect to Multiplex.

**A** Yes, sorry. I think "independent" would be independent of the contractors that installed, so bear in mind, that's subcontractors to Multiplex. So the contractors that would be validating would be independent to them.

**Q** Would be----

**A** Independent to the people that installed the ventilation itself.

**Q** I would assume independent both of the subcontractor and the contractor.

**A** Yeah. I mean, I can understand that and I wouldn't say that was wrong, but it wasn't the way it worked in this case.

**Q** Right. You may have answered this question: were you aware whether validation had been carried out?

**A** I wasn't aware of independent

validation, no.

**Q** Thank you.

**MR CONNAL:** And I think you perhaps touch on that on page 241, original page 34, where in an answer you say, "Well, I didn't see validation data at handover because of the population issue on Zutec. I didn't see it later." You had assumed that it had been done and accepted as fit for purpose in order for the Board to accept handover.

**A** Yes.

**Q** The point of ventilation validation that is to allow the client to say, "Yes, I can take this."

**A** Yes.

**Q** Okay. Thank you very much. I only have one question to you about the training regime because you have made quite a lot of comments that we can read in due course in your statement about training and whether it was good, bad or indifferent, and the distinction between familiarisation and technical training.

**A** Yes.

**Q** But was there an issue about people having enough time to attend training given what else was going on?

**A** Yes. The training was run in tandem with the handover and the operational commissioning period, so while we were busy dealing with that, the training was also being delivered at the same time. In addition to that, because we didn't have a full complement of staff on site, we had difficulties getting staff released from other campuses to come and take part in the training. We did get some, but it wasn't the numbers that we would have liked to have been involved in that programme.

**Q** Presumably the people that were on site might have had other things to do other than attend training.

**A** Yeah, but the people on site, the people that are part of my team – bear in mind it's a team of six, including myself – we were that busy doing all these other issues that we didn't always get time to go to these sessions. We tried to make sure there was always one or two people that did get to go so there was at least some knowledge, but we didn't always manage to do that.

**Q** Now, another-- Apologies again if this seems like a random question. I am jumping ahead a little bit. At one point in your statement you were asked about, "Well, were you not happy with a handover?" and you say things like, "Well, the Children's hospital was still a building site" and you make some comments about the CHP plant, which is another issue which we can go into; but you added a comment on 250, original page 43, at the top.

This is, I think, just after you have discussed the CHP plant and the fact that

you were concerned that the energy system was having an impact on the ability to use temperature to disinfect; and then you make a comment about-- Is that dosing you are talking about there at the top of the page? "Due to the complexity of the domestic systems, water treatment should have been included." Is that dosing a system with something?

**A** I don't know if I'm on the same page here.

**Q** Oh, sorry. 250 at the top of the page, the first full paragraph, "I believe that due to the size..." Have you got that?

**A** Yes, I have.

**Q** Thank you.

**A** Water treatment plant, yeah, dosing, yeah. That'd be the same thing.

**Q** Yes. And why did you think that dosing should have been part of the system?

**A** Well, the system is so large and complex that it was always going to have challenges in terms of keeping the whole system at an equilibrium – if I can say the word right – temperature across the system because it was multiple heat stations, etc., and the SHTM guidance suggests that if the system is filled earlier than occupation, then it should be considered for water treatment to keep the system in an acceptable condition. The system was filled nine months before occupation and although there was flushing programmes in place as per guidance to maintain the water flow rates and keep the water fresh, the dosing system would have actually absolutely meant that the system was kept clean.

**Q** We are probably jumping ahead a little bit, so we will no doubt trip up over this later on, but the filling nine months ahead of occupation, was that before the filters were in place that otherwise filter all incoming supplies?

**A** I believe it was. I didn't know that at the time, but I found later on that the system had been filled without the filters, yeah.

**Q** Right, okay. So you have the system filled about nine months before occupation, before the filters are in place. Did that concern you?

**A** Yes. I mean, that's part of why I feel that there should have been the treatment system in place as well.

**Q** Thank you. Now, on the same page, 250, moving to the second half of the page, this is a topic we are going to come back to a little later on, but you are talking there about – I suppose the key may be in the phraseology – a "pre-occupancy water risk assessment."

**A** Yes.

**Q** Am I right in thinking that that means it should be done pre-occupancy?

**A** Yes.

**Q** Before the building is handed over?

**A** Well, pre-occupancy before it's occupied by patients.

**Q** Occupied, right; and you thought that should have been done by Multiplex?

**A** Yes. I'm sure it was a contract requirement that they provide the pre-occupancy risk assessment.

**Q** And did you raise that with-- Is it Mr Loudon?

**A** I did. I think I raised it at one of the project meetings.

**Q** And what did he do about it?

**A** I think at the next meeting he came back, I'm assuming after consulting with Multiplex, and he instructed me to have the pre-occupancy risk assessment carried out.

And that is also something that is sometimes called the L8 assessment, and it is said to be focused on Legionella primarily.

**A** Yes, that's our Legionella avoidance document.

**Q** Thank you. That, I think, is probably your first involvement with that particular topic. You think it should have been done; you raise it; and you are told, ultimately, "Go and get it done."

**A** Yes.

**Q** Thank you. Thank you very much. I am just jumping forward again to



254, original page 47. I do not know whether I need to dig out the document for you, but there was an email by somebody called Frances Wrath.

**A** Yep. Frances was one of the project managers.

**Q** She was a project manager?

**A** Yeah.

**Q** Which stated that "all areas had been commissioned in line with employers' requirements."

**A** Yes.

**Q** Do you agree with that statement?

**A** I don't. I think that, again, at that time I might have agreed, because I think what statement does is it indicates that the Project team believed that that's what they understood had been delivered. Obviously, retrospectively I don't agree with it because of the issues that we've found since.

**Q** Thank you very much. My Lord, just for the notes, I am not going to bring that document up, but that document is to be found in bundle 12 at page 936. Trying to save a little bit of time by not going to the documents every time, Mr Powrie.

Then, in the next stage of your statement, you are asked about various wards, what was in place and so on and so forth, and then we come back to the topic of what I have been calling

paperwork in my old-fashioned way, but in this case the topic of asset tagging.

**A** Yes.

**Q** And you start to deal with asset tagging on 257, old number 50. Now, tell us what asset tagging is. We will probably touch on it very briefly, but not in any detail.

**A** Asset tagging is identifying each item with its unique reference that's recorded on the CAFM system. So each item's got a reference, usually made up of a combination of codes - site code, block code, level code, department code or plant room code, whatever - and then a unique number for that item. So, that asset code then is tied to the plant or the item that it represents in the CAFM system and allows you to keep records on its maintenance and allow its manufacturer's documentation, compliance issues, you know, be kept in a discreet----

**Q** Just so I am understanding this, if you had, I do not know-- I will invent an example, say a fan, which is part of an air handling unit.

**A** Yes.

**Q** Would it have an asset?

**A** That would tend to be a sub-asset of the air handling unit as an asset.

**Q** So there'd be a tag for the air handling unit?

**A** Yes.



**Q** I see, and I think you say on 257 that the whole point of this is so you can work your planned maintenance.

**A** Yes.

**Q** And does it tell you where this asset is?

**A** That's the reason for the coding. It tells you what building it's in, what level it's on, what site it's on, that kind of thing, because that should be a subsection within the Greater Glasgow Asset Register for the whole organisation.

**Q** And if things are not asset tagged, what impact does it have on PPM?

**A** Well, you've then got to start looking for serial numbers and cross-referencing to make sure that the item of plant that you're attending is the correct item of plant for that, plan preventive maintenance, et cetera.

**Q** So, when you came on to take occupation, that point where the board becomes responsible for the building, asset tagging happened?

**A** No.

**Q** When did it eventually get done?

**A** I think it was towards the end of the contract warranty period, so that would be about 2017.

**Q** So, did that impact on what your team could do between 2015 and the date in 2017?

**A** Yeah. I mean, it was part and parcel of the whole issue that we didn't have an operational CAFM system, so the whole failure to deliver that system impacted on ability to carry out PPM.

**THE CHAIR:** My fault, "Part of the whole problem... didn't have an operational..." and then I didn't catch----

**A** CAFM, the CAFM system. C-A-F-M.

**Q** Right. Got it. Thank you.

**A** Okay.

**MR CONNAL:** And this is again connected to it the other acronym we've been using, which is PPM.

**A** Yes.

**Q** So, if you do not know where the assets are because the tagging has not happened yet and CAFM is not populated, you cannot do PPM in the way that you are supposed to do.

**A** No. It would take a lot longer because you've then got to decipher where everything is and checks serial numbers, locations. It makes the whole thing more difficult.

**Q** Thank you. In fact, you deal with a number of these problems and how they impacted in detail on a series of pages in your statement that follow the one we have just looked at, and I'm not going to trouble you to read your way through all of that. So, let us leave asset tagging as another paperwork issue and perhaps move on. You were asked a number of questions about HEPA filters. You know what a HEPA filter is, I assume?

**A** Yes.

**Q** And there seemed to be a slightly peculiar situation where there was space for a HEPA but there were no HEPA filters in one of the level 2 wards. Is that right?

**A** It was wider than that. There's, I think, 36 isolation rooms. None of them had HEPA filters installed. Now, the difference with Ward 2A is that Ward 2A isolation rooms were designed to accommodate neutropenic patients.

So, they should have had HEPA filters fitted in them because it was for a known patient group. The other rooms were in areas where it could be for protective isolation or source isolation, so there was no way to know whether you needed a HEPA filter in that situation. So, I raised the issue about the filters being missing, and Multiplex told me that these were a user-defined requirement, and it was up to the client to install these where required.

I disputed that because Ward 2A should have been designed for that patient group. Therefore, the filters should have been there as part of commissioning. That was escalated through David Loudon and David picked

that up with Alasdair Fernie from Multiplex, and they obviously must have agreed that because Multiplex then sourced some filters from Ireland. I believe they had a project and they were able to procure those filters from that project to bring over to Glasgow, and the filters were then fitted in Ward 2A. So, that's the only ward that they should have been-- as per contract, should have been fitted in as part of commissioning.

**THE CHAIR:** Could I just take you over that so that I followed that? At handover, in the Children's Hospital, there were 36, as it were, holes waiting for HEPA filters.

**A** Sorry, can I just clarify that? There were----

**Q** Please do.

**A** -- 36 isolation rooms across the Adult's and Children's.

**Q** Right.

**A** I think in the Children's there was maybe 20.

**Q** Right.

**A** The rest were an Adult's.

**Q** Okay, so we are talking about designated isolation rooms, and that would include the rooms in 2A?

**A** Yes.

**Q** Right, and the requirement for HEPA filtration, again, is-- well, a source of requiring HEPA filtration is SHTM 03-01.



**A** Yes.

**Q** Right.

**A** Sorry, or, in this case, it was SHPN 4: Supplement 1, because that's what the rooms were designed to.

**Q** Right. Right, and the issue with Multiplex, if I have followed you, was that, "That may be, but we had no contractual obligation to fit a filter. That is something for the client."

**A** So, that was their position when I raised the question at first, yes.

**Q** Right. Thank you.

**MR CONNAL:** Thank you very much. Well, I will not ask any more about HEPA filters you will be pleased to know, Mr Powrie. Let us move on to another topic, another exciting topic: chilled beams. Starts to be dealt with in your statement at 267, original page 60, and you start there, I think, by setting out your personal view of using chilled beams in areas where there are immune-compromised patients.

**A** Yes.

**Q** Which you quite fairly say is based on your experience of things that happened at the hospital, and you list a number of reasons for your unhappiness with the idea: air changes, risk of condensation, dust particles being drawn into the system, and maintenance.

Now, you were then asked, I think, about any individual issues that you

remember cropping up, and you go on to tell us about a difficulty over the dew point controls----

**A** Yes.

**Q** -- that cropped up. Now, I do not want to spend too long on this, but what was the issue about dew point controls?

**A** Right, well, the first experience we had was it was summer, very warm outside, so when the air outside is warm, it holds more moisture. When it comes in, it gets processed through the ventilation plant and it hits cool surfaces. That moisture condensates and creates condensation.

When that's brought into the ward level itself and that moisture hits a chilled beam, which is at low temperature-- I think, from memory, the temperatures for the chilled beams was about 14 degrees. So, that then condensates on these cooling batteries in the chilled beam, and that condensation drips off the battery onto the chilled beam housing, and then through the perforations into the room itself.

So, on that occasion, it was happening in multiple wards across the site, so that led to the requirement for a rapid response for cleanup and sanitisation of the areas affected. On top of that, the condensation was black because there had been a layer of dust build up on the ventilation cooling battery, and that dust was turning the water black. So looked as if it was a high risk for infection.

**Q** Is there supposed to be some way of stopping this happening?

**A** Yes. The HTM, or SHTM, says where chilled beams are being used-- They tried to allow for innovation in design, so chilled beams are not ruled out, but where they are being used, they should be fitted with dew point control sensors, and what that does is once the temperature of the chilled beam is basically at the point where the air would condensate on the temperature of the chilled beam, it shuts the chilled beam off to avoid the condensation event.

That wasn't installed on their system, although it's an HTM or SHTM requirement. There was a reason given for that, and that reason was that they experienced problems of dew point shutdown in the lab building when it was handed over, and it was causing excessive temperatures in the labs.

So, that was raised as a concern with Multiplex as to its impact when moving into the hospital. I hadn't been aware that they had designed the dew point control out totally as a result of that, and therefore we ended up with this problem as a result.

**Q** Right. Let me just make sure I

can follow that. SHTM 03-01 – which, in fairness to you, you quote on page 268 about halfway down – basically says there needs to be controls that deal with this issue of dew point.

**Q** Yes.

**Q** That is what the guidance anticipates, and what happens is you call out the engineer. He looks at the control box and discovers there is no dew point control.

**A** Yes.

**Q** Yes. So, you go and try to find out what has happened, and you eventually discover, and this is dealt with a 269, large letter "A" near the top, that, actually, the dew point controls had been taken out, whatever SHTM 03-01 says.

**A** Yes.

**Q** Were you then charged with trying to sort this out?

**A** Yes. However that came about contractually-- how it was agreed, I don't know, but I was then asked to look at, "What other options can we do to address this?" So, I worked with Schneider Controls, who had installed the controls for the campus, to develop a proposal. I then nominated Paul McAlister, I think it was, to work with Schneider to thrash out the detail of that proposal and make it a workable design, and then got approval from David Loudon to spend the money to implement that proposal.

So, basically, the proposal was that rather than go back in and try and reintroduce the dew point control on every chiller battery or chilled beam, that we would do a central dew point control for each of the distinct loops of chilled water, and, basically, we put a control on there that says, "When the temperature reaches dew point, shut the chilled water circuit off to avoid condensation across the site." So, we did that on-- I think there was about nine different zones that had their individual controls to avoid further condensation events.

**THE CHAIR:** Was that successful?

**A** To my knowledge, when I retired there had been no further condensation issues. I don't know if there's been any since but, 2019, it had been successful up until then.

**MR CONNAL:** So this is, and I think the Inquiry's heard from other witnesses, about water dripping down from the chilled beams.

**A** I think that might be different issues. I don't think it's condensation. Some of the--one of the issues that I've seen in the bundle was relating to a leaking coupling.

**Q** Relating to? Sorry, I missed that.

**A** A leaking coupling.

**Q** Ah, right, okay.

**A** So, back to when we were talking about the push-fit connectors, the new couplings were compression fittings. That means that you tighten them up against a seal and they're mechanically sealed after that. So, I think the issues you're referring to might be relating to where these have failed, and I believe that some of them have failed due to-- again, after I retired, but I believe some of them have failed due to temperature fluctuations, due to failures of boiler plant. The temperature's dropped down and come back up again, and the coupling mechanical seal has failed because of expansion and contraction.

**Q** Thank you. Obviously, when you were discovering this issue and you were saying that some of the droplets that were coming down were picking up muck----

**A** Dust, yeah.

**Q** -- dust from part of the system and therefore appearing as black.

**A** Yes.

**Q** Did that also mean that you had to look at organising how these would be cleaned?

**A** Yes. I looked at the manufacturers recommendations for cleaning, and the manufacturer was saying depending on the environment, they should only require to be cleaned every five years, and given that we were in a clinical environment which, in effect, is clean, you would expect that to be the case.

However, what we were finding was that these chilled beams also had an induction component. What that means is that they draw some air in from the room and then mix that with the supply of fresh air, and then reintroduce it to the room again. I can't remember the proportion but, in effect, what that means is that air that's been inducted back into the chilled beam is drawing fibres in with it from the room environment, and those fibres are settling on the coil and that's building up a layer of material that then created this black condensation.

**THE CHAIR:** Can I take an advantage of this moment to improve my understanding? Am I right in thinking that chilled beams may be active or passive?

**A** Yes.

**Q** What we are talking about are passive chilled beams. Am I right about that?

**A** Yes. I think so, yes.

**Q** Right, yes. Sorry, Mr Connal.

**MR CONNAL:** The point you were discussing was the fact that, under the system they operated, a proportion of the air that went through the chilling process was taken from the room----

**A** Yes.

**Q** -- and thus brought with it, I do

not know, somebody had been vigorously shaking the bedding or whatever it was.

**A** Yeah. It's quite common to get fibres from the bedding, or when you've got surgical packs – it's a blue kind of paper – the fibres come off of that quite readily and can be entrained in the air as well.

**Q** Yes. I just have one more question on chilled beams, you will be pleased to know. On page 271 of your statement, original 64, near the top-- at the bottom of a small paragraph with a (j), you say that there was some testing done of samples within 2A----

**A** Yes.

**Q** -- and your understanding is that the buildup was inert.

**A** Yes.

**Q** Is that correct, because I think----

**A** That was my understanding----

**Q** -- it might be suggested to you that it was not inert.

**A** I'd never heard of that. The samples that were taken and passed over to Teresa Inkster, and the feedback I got at that time was the samples were inert. I haven't ever been told anything different than that.

**Q** Okay, thank you. The next topic that crops up is on the next page, 272. I want to just ask, first of all, a question that is not covered in your statement. Thermal wheels: do you know whether they were in one location in the hospital, or many locations?

**A** I think they were pretty much in all locations. I think it was a standard design feature of the ventilation.

**Q** Do you know if there is a record of where all these thermal wheels are?

**A** There will be in relation to the detail of each air handling unit plant, but I don't know if there's a concise record.

**Q** I think it was suggested in the course of some other evidence we have had that there was some kind of Excel spreadsheet which sort of set it all out where all the thermal wheels were. Is that anything you know about?

**A** No. No, that might have been after 2019.

**Q** Thank you. You pick up thermal wheels – and I am conscious of the time, I will not spend long on this – on 272, original page 65, and you express your view about the use of thermal wheels I think on the next page, 273, in the context of the housing of immunocompromised patients.

**A** Yes.

**Q** And then there is a discussion there about, is it a small risk or should you eliminate that small risk effectively? Is that right?

**A** Yes. So the inclusion of a

purge section within the thermal wheel is meant to eliminate that risk, but you still get the potential for what they call bypass of the thermal wheel. So the thermal wheel is in the housing and it's sealed in that housing with a running seal. It's a big wheel driven by a belt. So there's a seal around that that's like a brush that contacts the external side of the wheel. That can have bypass on it, so air from the downstream can bypass the thermal wheel itself and go down through these-- what do you call them? Seals.

Equally, I don't know that the purge sections are 100 per cent effective, and when I discussed this with the manufacturer, they had advised that if they'd known they were going into an environment where it was immuno-compromised patients, they wouldn't have recommended thermal wheels be installed.

**THE CHAIR:** Sorry, could you just give me that last two sentences again?

**A** Sure. So the manufacturer, I think it was a company called Barkell, and when I discussed-- I was working with Matthew Lambert at the time, and we were both communicating with the manufacturer and we both get the same feedback. If they had been made aware that thermal wheels were to be used in their handling units supplying neutropenic or immunocompromised patient areas----

**Q** Yes.

**A** -- they would have recommended not to install them.

**THE CHAIR:** Right. Thank you.

**MR CONNAL:** Just so we have a reference for that, I think you have touched on that in your statement already, 273 at "A" near the top. You say that:

"Recommendations from the designers/manufacturer is to further protect immune compromised patient facilities by not employing thermal wheels."

Is that the discussion you have just talked to his Lordship about?

**A** Yes.

**Q** Thank you very much. My Lord, I am conscious of the time now. Moving on is something I have been trying to do, but I would be doing it again. So if it is convenient, this might be the time to take a break.

**THE CHAIR:** Right. Well, we are now at, I think, half past. As I said, we usually take a break----

**THE WITNESS:** Okay.

**THE CHAIR:** -- mid-morning. Could I ask you to be back for ten to twelve?

**THE WITNESS:** Yes, no problem.

**THE CHAIR:** You will be taken to the witness room.

**(Short break)**

**THE CHAIR:** Mr Connal?

**MR CONNAL:** Mr Powrie, welcome back. I have been asked to raise a question with you. It is not covered in your statement. It is a single question, and if you do not know the answer, please say so. We have heard a bit this morning in the course of other evidence about what the contractor should or should not have done and so on. Was there a person or body, to your knowledge, charged with, as it were, supervising the compliance by the contractor with their obligations?

**A** My understanding would be that would have been Capita.

**Q** Right.

**A** Who were meant to ensure that the contract was meeting the contractual requirements.

**Q** Thank you. Now, returning to your statement, you deal with a number of issues about the CHP plant, which I do not intend to take you to. Sorry, my Lord.

**THE CHAIR:** Just reflecting on the question and answer. The question was, "Who was supervising the contractors meeting their obligations?" and, quite understandably, the answer to that was, "Capita", who was, on behalf of GGC, checking on contractual obligations, as one would expect. I do not know if you want to take that anywhere.

**MR CONNAL:** It is simply-- I have been asked, my Lord, to see if this witness could identify----

**THE CHAIR:** Right, okay.

**MR CONNAL:** -- was there somebody or some body-- some individual or somebody which had the general role of trying to make sure that the contractor fulfilled their contractual----

**THE CHAIR:** Their contractual obligations.

**MR CONNAL:** -- contractual obligations to do this, that or the next thing, and Mr Powrie has given me the answer.

**THE CHAIR:** Indeed.

**MR CONNAL:** For various reasons, including the fact it is probably not a central issue for Glasgow 3, I am not proposing to pursue this further at this time. So, I was just saying, Mr Powrie, that I am kind of skipping past some CHP stuff and stuff about water temperatures, because you really gave us that evidence earlier. We may find, as we go through your statement, that we trip up over bits that, for one reason or another, we have already taken from you. So please accept my apologies.

I am going into a section now that starts with page 289, original 82, where we are dealing with water guidance. Just so we get some explanation and

background, you have been a designated postholder for water in one of your previous roles, so you were able to respond to lots of the questions about what should be in place and so on, is that correct?

**A** Yes.

**Q** Thank you, but you have already told us you were not involved in the contractual commissioning or anything of the water system?

**A** No.

**Q** And did you have some knowledge about the necessity to have systems in place focused on Legionella?

**A** Yes.

**Q** You touch on this on page 292, original 85, and you are asked there about Legionella training, presumably for staff at the hospital, and you say that there was not any until 2018?

**A** Yes.

**Q** Why was that? Do you know?

**A** Well, as part of the maintenance strategy that we spoke about earlier, I had developed a training matrix, highlighting all the training requirements for mainly managers and supervisors, and Legionella training was one of those for the people that were going to be involved in water management.

After handover of the building, the post of the Estates general manager was



implemented, and before that I had this training programme, I'd started carrying out some of the training in relation to high voltage for authorised persons because of the nature of the high voltage network control on the site, and any response to that in an emergency required an authorised person. So, I'd already delivered the training on that.

The next stage was to deliver training on the water management, Legionella, etc., however, in between times, the new general manager was appointed and----

**Q** That is Mr Alan Gallacher?

**A** That's correct.

**Q** Yes.

**A** And they developed a compliance team. Tommy Romeo, due to staff changes, was brought in to be the AP nominated, and Tommy raised with me the fact that he hadn't been trained and that he would do what he could but he hadn't the training behind him. So, I raised that----

**Q** Sorry to interrupt, Mr Powrie. The note that I have says that there was not a compliance team until late 2016.

**A** Well, that would be in line with this. Alan told me that he was putting in place a compliance team and that the compliance team would develop a training programme and that the relevant personnel would be trained in line with

that once it had been developed. So, that's as far as the training went at that time.

**Q** Thank you, and that is dealt with, as I say, on page 292, original 85, in the middle of the page. Then over the page, 293, original 86, we find there discussion of the question of different people holding different posts relating to water and how they had to be appointed.

**A** Yes.

**Q** You say that you understood that needed to be done and you had taken at least initial steps towards doing that. Is that correct?

**A** Yes. Taken in relation to discussions with DMA, I had written out a schedule of the nominated personnel that would fulfil these roles for recording in the water risk assessment and the written scheme, and I forwarded that on to Mary Anne Kane and asked her to verify that these would indeed be the post-holders, and asked her about appointments. Mary Anne said she would take that to the Infection Control Committee and would get back to me with validation or verification of that.

**Q** Was that in 2015 sometime? Do you remember?

**A** Yes, it would be, because it was following on from the initial discussions about the water risk assessment.



**Q** Thank you. You said you had given these to Mary Anne Kane. Did she get back to you on it?

**A** I don't think-- I don't recall her ever coming back and giving-- There certainly wasn't any appointments, and I don't recall her coming back. She verbally verified that these were now the right names, but she wanted to validate that from the Infection Control Committee. I don't remember her ever coming back to confirm.

**Q** So, the net result at that point was that there were not in place duly appointed holders of any of these posts?

**A** Correct.

**Q** Authorised person and so on?

**A** Yes.

**Q** What about an authorised engineer for water?

**A** Authorised engineer-- At the start of the programme, I don't think that we had an authorised engineer. One was appointed-- I don't know the ins and outs, because I wasn't involved in the appointment, but one was appointed and I think that was 2015, but I couldn't pin a date to that.

**Q** You cannot put a date on it? Thank you very much. I just want to ask you about-- We do not get very many moments of light relief in these sessions, perhaps for understandable reasons, but I just want to ask you about something

you say on 294, original 87 of your statement, where you have already told us you were not aware of the commissioning of the water system, and you were not invited, you say, about halfway down the page there. Then there is a comment here about, you were told that Multiplex would be quite happy if you did not come to meetings, because you cost them money.

**A** Yes. This was third-hand, obviously, from Mary Anne in the discussion, and she had said to me that David Loudon had told her that he had been asked to hold me at arm's length from the project, because every time I got involved, it was costing money.

**Q** Thank you. We move on to 296. We already, I think, identified what L8 is. It is the Legionella, supposedly, pre-occupation water assessment. Is that right?

**A** Well, L8 is the HSE guidance on the control and management of Legionella, but it's the guidance document used for all of these on top of the new HSG documents as well.

**Q** Earlier in your evidence, you had explained that it was not a pre-occupation one. You had asked David Loudon about it and he had come back to you and said, "Well, you get on instruct one."

**A** Yes.



**Q** And I think you are telling us, at the foot of 296, that you did instruct one, and that would be with DMA Canyon.

**A** That's correct.

**Q** Purely practical question: you say, "when you got it from them." Did you get it from them electronically or in hard copy?

**A** It was hard copy. We had a meeting to review and they gave us hard copies, but I think they also sent electronic copies.

**Q** Thank you. So, you say at the foot of 296 you had a meeting with DMA, David Brattey, and Jim Guthrie.

**A** Yes.

**Q** And you sent Mr Brattey and Mr Guthrie off to work with DMA. Is that right?

**A** Yes.

**Q** Thank you. Now, on the next page, we come back to this question of filling of the water, and you have given us the dates for that and whether it was in advance of the filtration and so on already in your evidence, so I do not think I need go back to that. There is perhaps a little issue that you deal with which I am not sure we have come across before, on 298, which is a reverse osmosis filtration.

**A** Yes.

**Q** What is that?

**A** It's a type of filter that they use

for the renal dialysis process. So, the water that goes through the dialysis machines has got to be pure, because it's potentially coming into contact with recirculated blood. So, the reverse osmosis machine filters that to deliver quality required for the dialysis process.

**Q** Right. The issue that you are discussing at the top of 298 is the fact that the reverse osmosis line had to be taken out of operation to be sanitised from time to time and there was not a backup. Is that right?

**A** Yes. That's an automatic process that happens every 24 to 48 hours, and the reverse osmosis plant shuts down and a heat sanitisation process is carried out on the pipework. It's not so much for the filter itself, it's for the distribution pipework for the renal service. So, that's heat sanitised as part of that system, and it's an automatic process. The----

**Q** Does----

**A** Sorry.

**Q** No, no. Please carry on, you were about to tell me what the issue was.

**A** Yes. The issue was that, while that's happening, it takes several hours to complete. If they've got an emergency-- It happens out of hours, normally, so if there's an emergency renal patient that needs dialysed, then they don't have a source of renal water to do that. So, the



Project team in consultation with the clinical department put on six-- I think it was six renal connection points onto the potable water system – potable water being drinking water – and then the machines that would be connected to that would have miniature filtration plant on them to allow them to use that water for the dialysing process.

So, that was okay for what they needed, but then it created a risk in terms of the potable water, because these would be seldom used outlets and they'd be required to be added into a flushing regime and management regime.

**Q** Right. So, you are creating outlets that are only going to be used in an emergency, which may have water in them, and therefore they are in that box of things you need to remember the water is just sitting there----

**A** Yes.

**Q** -- and deal with that.

**A** Well, they were engineered so that there was only a short tail from the water loop to the machine connection, but it was still a perceived risk.

**Q** Yes, and you tried to suggest a solution, I think.

**A** Yes.

**Q** And what was that solution?

**A** The solution was to put in another loop, so that it was a standby loop feeding a reduced number of points,

but that would be in operation while the main loop was being sanitised, and then the emergency loop would be sanitised independently of that at a different time.

**Q** So that at all times there would be water which had been subject to this reverse osmosis?

**A** Yes.

**Q** Available either by the main loop or the standby loop?

**A** That's correct.

**Q** And I think you tried to get that done and you were told there was no money.

**A** Well, I put in a capital application for funding to have that carried out, but competing against other projects that maybe had higher priority, there was no funding made available.

**Q** In the next paragraph, you are asked, "Well, what is the trouble with potable water?" and you say, "Well, it is safe to drink, but you have to then [as you told us] treat these outlets as seldom used ones and subject them to flushing."

**A** Yes.

**Q** I have been asked to ask you, does that mean they are also treated with biocides?

**A** If the system is treated. I mean, at that time we weren't treating it with biocides, but there is a chloramine treatment that's carried out by Scottish Water, and that could still be active on site as it comes through our system. So, there is a risk that chloramines are fed through those systems. That's dealt with at the reverse osmosis plant by the installation of carbon filters. We don't look after the renal equipment, that's clinical physics that look after that. So, clinical physics would have a mini filtration unit attached to a machine if it used on a potable water system, and it would have its own mini RO unit and carbon filter to deal with that.

**Q** Thank you. I think in the next section you deal with a topic that, almost by accident, we covered earlier, which is the filling of the overall water system about nine months, you later discovered, before handover----

**A** Yes.

**Q** -- which is at the foot of 298, original 91. You tried to find out why it was and you were told why it was, and you said, "Well, should we not treat it?" and you were told no.

**A** Yes. Well, again, the feedback on that was that the SHTM guidance said that that was an admission the system wasn't engineered properly and this was a modern, compliant, engineered system. That was the gist of the feedback.

**Q** Yes. I think somewhere in your statement – and we will just touch on it now, since you have raised it – you quote from SHTM 04-01, where there is a

statement, and I think that is what you are referring to, which says, in effect, if you chemically dose, that is an admission that between the system and its maintenance you are not able to keep it----

**A** Yes, it's not fit for purpose.

**Q** -- to the standard you need. Thank you. Thank you very much. Again, this is just a point of detail rather than a substantive topic I want to deal with. Can I just take you to the foot of 300, original 93, please?

You were asked there about pre-occupation water tests, and you said, "Yes, there were some," and you (sic) then said, "Well where would we find them?" and you have given an answer to that. Do you know whether any of them were out of specification?

**A** Is this pre-hand over or post-hand over?

**Q** This is pre-occupation.

**A** Pre -occupation. Well, that could still be-- if it was during the operational commissioning period, there were some that were out of spec, yes, but these were sanitised and retested and were clear. I couldn't give you details. I can't remember how many or how often but that was part of process of preparing the system for handover for occupation-- was to make sure that as each ward was occupied, it had been tested, sanitised, and tested again to make sure that it was of suitable quality.

**Q** Thank you. Another point of detail, please, at the foot of 302, original 95. The point is being put to you there were positive Legionella results in Ward 2A in June 2015, and the assertion is that you had said, "Well, I don't want to put anything in writing." Do you have any recollection of that?

**A** Me personally?

**Q** Yes, saying that.

**A** No.

**Q** Do you remember these results at all?

**A** I don't. I don't remember Christine raising any issues about Legionella positive results. No, I don't have any recollection of that at all.

**Q** On 303, which is effectively the next point, original 96, paragraph headed "99", you are asked whether Christine Peters asked you for the risk assessment for waterborne infections, and did you give her it?

**A** I don't remember Dr Peters asking me for that directly, and if she asked the Project team or Mary Ann Kane, they didn't pass on to me. So I didn't share it at that time, no.

**Q** Thank you. Now, can we just move on please to-- another heading starts, at least, on 306, original 99, headed, "Water system in general," and you have been asked there about testing

and maintenance protocols and regimes and what was being done about that, and are you saying that is something that Mr Brattey and others were dealing with?

**A** Yes.

**Q** And that the meeting that you talk about in paragraph 109 with Mr Brattey and Mr Guthrie, and originally you had thought Mr MacMillan but he could not make it. Is that the same meeting that you've referred to a little earlier on----

**A** Yes, it is.

**Q** -- once the DMA assessment came in?

**A** Yes.

**Q** Thank you. Again, a point of detail, if I may, I have been asked to raise with you. Page 307, original 100, at the foot. You were asked about any concerns about testing and stagnant water in the system, and you explained that Mr Guthrie was managing various testing and sanitation processes. You said that concerns over stagnation were highlighted by DMA, and your expectation was that Mr Brattey and Mr Guthrie would deal with these. Is that right?

**A** Yes.

**Q** Did you yourself-- Leaving aside what Mr Brattey and Mr Guthrie might do, did you raise that issue with Infection Control at all?

**A** No, it didn't.

**Q** Thank you. Now, I know I will be able to check my ability to quote correctly from this SHTM 04-01 because on page 308, original 101, we find further reference to the water system being filled into your argument that there should have been dosing because of that and because your view is that that is needed generally. Then there is a quotation in the middle of that page from SHTM 04-01 (Part A) V1, section 15.1, saying:

"The introduction of chemical treatment...is an admission that the physical installation and/or the management process is incapable of maintaining that water supply in a wholesome condition."

**A** Yes.

**Q** Now, just while we are talking about dosing, because we know-- a matter we have not got round to yet, that ultimately dosing was applied----

**A** Yes.

**Q** -- in the hospital. I mean, is it normal to have a major building like this with a constant dosing system? Do you know?

**A** I think it's more common than it was. I mean, there's other sites in both at the Queen Elizabeth campus and in other sites in Glasgow where there's water treatment in place as a standard, but they've been installed due to water maintenance issues. So it's not uncommon. I think the newbuild scenario

is restricted by that statement in terms of whether they're installed in newbuilds or not, but I think there's also other statements in SHTM that say that you should consider installing water treatment if you sell the water system early or it's a large complex system of anything.

**Q** Thank you. If you do not know the answer to this question, please just tell me. Are there any other impacts other than killing off bugs that are caused by dosing?

**A** Yes. Well, if you're looking at chlorine dioxide which is the preferred product, there's limitations on the level and concentration of chlorine dioxide that can be discharged at the point of use. So that's the tap for consumption. That's limited to 0.5 PPM maximum. So, you've got to ensure that for-- in order for it to stay portable, it's maintained below that level. I think these levels are set by the World Health Organisation.

**Q** Now, in effect, what has happened in the immediately succeeding section is that you have been asked:

"Well, if you were trying now to think of what could have been done to make things work better in terms of water, given the building you were dealing with and so on and so forth, what would you have needed to do?"

And on 309, original 102, you set out your own views on that topic. Is that



correct?

**A** Yes.

**Q** And you start with the automatic dosing, which we have touched on, and then you suggest having an authorised engineer for water prior to handover. Does that seem sensible to you?

**A** Yes.

**Q** And then the appointment of other appointees under the water appointee structure also prior to handover.

**A** Yes.

**Q** And why are you suggesting that?

**A** Well, I think if these posts had been in place prior to handover, they would have had the opportunity to influence the design, the testing, commissioning, validation, etc., and they would have been able to influence the process that was adopted, and they would be experience and knowledge of the system as we're going in, and be able to have the correct processes and procedures in place ahead of opening, rather than trying to implement that while you're doing all these other functions to get the building occupied.

**Q** I do not need to get you to read it out but is that the point, essentially, that you are making against paragraph f on the page in front of you

now from 309? You suggest at least six months.

**A** Yes.

**Q** And then you make other, no doubt, helpful suggestions as to things that could conveniently be in place. At 310, another product drops up, which I do not think we have touched on so far, called Sanosil.

**A** Yes.

**Q** What is that?

**A** Sanosil is the silver peroxide, or silver hydrogen peroxide, that was used as the original a sanitant by a Multiplex for a sanitisation of the water system prior to handover.

**Q** Right.

**A** And then we adopted that for our sanitisation process for continuity and to ensure that we had the same efficacy as had been recommended for that process.

**Q** If we look on 311, original 104, do we find that this caused a particular issue with opti-therm-- "TMT" means thermal mixing taps. Is that right?

**A** Yes.

**Q** There was a particular issue with that tap.

**A** Well, I think that's part of the reason that the Sanosil dosing level was set up what it was. I think Multiplex had consulted the manufacturer, and the manufacturer had advised to sanitise at that level in order to mitigate any risks that would be to the Optitherm TMT. Horne Engineering, who make that tap, had-- I don't know if I'm-- maybe (inaudible) you can ask next on that.

**Q** No, it is all right. We are coming to that shortly, but that is a particular type of tap that you had quite a lot of involvement with. Is that right?

**A** Yes.

**Q** And I think the point might be a sort of question: well, does this not seem a bit odd to be using something less than the recommended dose just because of a warranty issue?

**A** Mm-hmm. Absolutely. Without a doubt, I would say that that should have been challenged at the time, yes.

**Q** Thank you.

**THE CHAIR:** Just so that I am following, did you say that the active constituent of Sanosil is-- did I hear you saying silver peroxide?

**A** Yeah. silver----

**Q** Is it peroxide?

**A** I don't know if it's peroxide or silver hydrogen, but it's silver based.

**Q** Okay. Maybe silver hydrogen peroxide?

**A** Yeah.

**Q** And the difficulty with the tap, was it corrosion?

**A** The manufacturer said that the

tap should not be chemically sanitised in any chemical.

**Q** Any chemical?

**A** Any chemical because it would react with the components in the tap, and the tap would fail as a result. There wasn't a time scale on it, just it would fail-- other components would fail but their recommendation was it should only be thermally sanitised.

**Q** Thank you.

**MR CONNAL:** Well, let us just deal with taps. These are quite often referred to in the papers the Inquiry have as the "Horne taps."

**A** Yes.

**Q** Horne with an "e" at the end of it. Am I right in thinking that you were involved at least for a short time at the stage when these were being potentially selected for installation into the new hospital?

**A** Yes. I was at the assessment meeting they had for the proposed option for taps. So I think, from memory, there was three, maybe four taps that had been identified by Multiplex as being a potential for use on the project.

**Q** Beauty parade for taps?

**A** Yes.

**Q** Right, and you had a particular concern about the horne taps?

**A** I had raised at the time-- On the fact that they said they should only be thermally sanitised, I had raised my concerns that to thermally sanitise a system as large as this-- they say that the tap can be sanitised at system temperature, which is 60 degrees. To thermo-sanitise these taps at 60 degrees would need massive amounts of people involved even if you broke it down into zones and sections because you would have to have people there while the taps are running to ensure that patients and staff aren't getting scolded. So, it's an impractical solution to implement a thermo-sanitisation programme in an operational hospital, especially one of that size, and I had raised that as a concern, and Horne stood by their commitment that it should only be thermally sanitised.

**Q** Yes. So, you have told us that they have said, "Well, you cannot use chemicals. It has to be done this way."? Thank you. We can probably take this reasonably short. It is dealt with on 314, original 107. The sanitisation process that you were talking about that was recommended, you eventually found, required the taps to be sanitised at 60 degrees for 20 minutes.

**A** Yes.

**Q** And you had a view as to whether that was feasible in a ward.

**A** That just wasn't practical, 20 minutes of 60 degree water flowing

through. Now, even if it was broken down to a ward at a time, you're talking about maybe 60 taps that you've got to have staff managing, monitoring and ensuring that nobody is touching these during that process. The taps have to be open to do this, and equally it doesn't sanitise the cold side of the tap. It only sanitises the hot. But there are connections that are provided by Horne to be attached to the tap to allow you to sanitise the cold, but then again there's a process to do for that across-- I think there's something like 2500 Horne taps on the site, so----

**Q** It may be obvious, but why are you having to sanitise the taps? What are you trying to get rid of by the sanitisation?

**A** It's a process for sanitising against any stagnation, seldom used outlets, that kind of thing, or the issues round about what they call the flow regulator. The flow regulator was subject to another guidance document to say that they should be removed, so it would be a sanitisation process for that as well.

**Q** Okay, well, in the hope of getting this reasonably short, what I understand – and tell me if I am wrong – is that there was an outbreak of illness that affected very young babies, I think, in Northern Ireland.

**A** Yes.



**Q** It led to a recommendation that flow straighteners should be removed----

**A** Regulators, straighteners, there's different names, yeah.

**Q** -- from taps because they had been implicated in the illnesses which had led to unfortunate, I think, deaths in Northern Ireland.

**A** Yes. Yes, I think there was six.

**Q** Six. And am I right in understanding that you could not just, you know, unscrew the flow regulator from the Horne tap? It could not be done?

**A** No. The HPS guidance on pseudomonas, which is the guidance you're talking about, said that all flow straighteners should be removed as a safety precaution. I've looked into that in partnership with Horne to say, "This is an edict that's coming out and we need to apply," and they said, "You can't do that on these taps. The regulator performs three different tasks; if you take them away, you defeat the function of the tap." I raised this with David Loudon and the Project team, and that created a problem because obviously the guidance was saying one thing. We had a site that had been fitted out with these tarps that couldn't be modified and it would affect the project programme, so David asked me to set up a meeting with the manufacturers, Health Facilities Scotland,

HPS, and I think we had someone from Porton Down, Dr Walker, on that meeting as well.

So, the outcome of the meeting was that HPS came back with the same opinion that the regulator was still a point of risk and should be removed and gave three options of how that could be achieved on our project, and one of the options was, "Carry on as you are and manage the process," or the other options were basically both the same in different versions, remove the taps and put something else in. So David Loudon decided to retain the taps and put in a management process.

**Q** Were you then charged with trying to work out how to sanitise if the 60 degrees for 20 minutes was not feasible?

**A** Yes.

**Q** Did you come up with an alternative to 60 degrees for 20 minutes?

**A** It wasn't an alternative; it was still using the thermal process, but my proposal was to do a service exchange process where we take----

**Q** Take a tap off, put a new one on?

**A** Take the tap off, put a new one on that's been processed and then take that tap away and process it remotely but at 70 degrees so that we could sanitise it within three minutes. I worked with Horne to procure the heat stations and the equipment to implement that. However, we didn't have a workshop facility to allow us to implement it at that time. We had to create that workshop facility and create a heat source that we could run and vary between 60 and 80 degrees, I think it was, from memory.

**Q** Sorry, was this all happening in 2015? Because at this stage not all the taps had been installed. Is that right?

**A** Well, 2015, I don't know if there were still taps outstanding in the Children's, but 2015, in principle they should have all been installed. The actual meetings that we're talking about happened in 2014. The process of working with Horn went through into 2015.

**Q** I think in fairness to you, at the very foot of 314, original 107, you are talking about working with Horne in June and July 2015. See that?

**A** Yeah, that's the development of the workshop. I mean, the reason for that was obviously to get past all the migration issues. Then we had procured the equipment till I was to create the workshop and I had asked David Brattey to take on the task of creating the workshop and creating the heat exchanger for running this timeshare sanitisation programme. That needed to be connected into the existing pipework so that we could generate-- That would

be the LTHW pipework, so that we could generate domestic hot water at 70 degrees.

**Q** Yes. Thank you very much. So if you look on to 315, original 108, at the top, you are talking there about getting the workshop created and then saying that due to the pressure on him, he did not get round to it.

**A** He hadn't delivered it by the time he retired. Now, that's, from memory, probably about 2017, and then Paul McAllister took over his role and I asked Paul to take that on and Paul turned it around fairly quickly, but by the time it had been turned around we were starting to have problems with the water system, so that process never really got implemented at that time.

**Q** I think what is usually referred to as "the water incident" was 2018, so does that mean that between 2015 and 2018 this was not operational?

**A** Correct.

**THE CHAIR:** Sorry, when you say this was not operational-- My fault for not keeping up. What do you mean by this?

**MR CONNAL:** I think I was meaning the intended ability to thermally sanitise at a location away from the wards.

**A** On a service exchange, yeah.

**THE CHAIR:** Thank you. Thank you.



**MR CONNAL:** Right. Can I ask you about another stage of events, what is usually called the water incident, just before I take you to any documents? Was I right that there was a group set up to deal with it called the Water Technical Group or something of that kind?

**A** That was after the IMT had been set up, yeah.

Yes, and we will see in a minute that contained all kinds of representatives from different interests. Is that so?

**A** Yes.

**Q** And were you involved in that?

**A** I was.

**Q** In simple terms, was one of the exercises that group was doing finding out whether you had at the new hospital what was described as widespread contamination in all kinds of different locations?

**A** Well, that was a kind of combination between the IMT and the Water Technical Group as they started to find more positive results in patients, in their bloodstream results, and started casting that wider in terms of testing, but still specifically Ward 2A at the time. They were getting test days where they were looking at possible decant facilities, and then we started looking further afield at the decant facility and testing there to find that we were having problems there as well, so I think that would be the

catalyst for wider-spread test programs.

**Q** When you say wider spread, that is not just 2A; that is all over the hospital, is it?

**A** Well, we started 2A and then 4B, and then we started testing all over, including risers, water tanks, that kind of thing, as we started to see that we had a more systemic problem.

**Q** Now, I do have some minutes of these meetings, but I may not need-- You just used the phrase "a systemic problem". Was that a conclusion reached by this group?

**A** Ultimately, yeah.

**Q** Well, let me just look at one of these so we know what we are talking about. Could we look at bundle 10? It is document 1, but it is page 9, and do we see there what is called a water review meeting in this case? A meeting with Mr McLaughlin from HFS, Annette Rankin from HPS, Mr Gallacher we know, you we know, Mr Kennedy.

**A** He was a public health doctor.

Right, and Mr Purden, you have mentioned, and a Mr Storer, who is also from HFS, and potentially there should have been Mary Anne Kane and someone called Alexandra Merrick, and there is an admin assistant to help.

**THE CHAIR:** Just on the question of what we're calling this, it is headed "Water Review Meeting", but it is a meeting of, if I am following, the Water Technical Group.

**A** Yes. Yes.

**THE CHAIR:** Thank you.

**MR CONNAL:** Can we just follow that document down, please, just so we see roughly what is being done at that meeting? There is a spreadsheet of results, outcomes being mapped on floor plans. Is this all familiar to you?

**A** Yes.

**Q** Then there is talk about where to test next and so on, and you make some suggestions about that. Can we just carry on, please, on the same document, probably the next page? There is discussion of sundry other issues. Another acronym appears under the heading "Agreed-To POUF"?

**A** That's point of use filter.

**Q** Right.

**A** So these are the filters that were installed retrospectively on the tap outlets.

**Q** Right.

**A** So that's an absolute filter so that whatever's in the system isn't coming out to the patient.

**Q** So even if you have a problem in the water, you can filter it out by this filter. It does not sort what the problem is in the water, but it stops the recipient of that water having a problem.

**A** Yes.

**Q** Thank you. If I put these simplistic things to you, Mr Powrie, and you think they are wrong, please just tell me. So just carrying on down that page, talking about random tests, and then there is a note in the middle just before the next POUF. "Every floor had positive and negative readings, thereby this would indicate a widespread water infection."

**A** Sorry, I'm not with you. Where is that?

**Q** Sorry. Do you see "0–3 in RHC and 4–11 in Adult"?

**A** Yes.

**Q** And just beneath that, the sentence there?

**A** Got you, yeah.

**Q** And is that effectively what you are talking about?

**A** Systemic, yeah.

**Q** Thank you.

**A** I think that was us starting to see that it was widespread.

**Q** And these meetings then continued later on in 2018 to do the same exercise, essentially continue to test and then work out what to do about it.

**A** Yes.

**Q** Is that the point at which the option of putting in chemical dosing started to emerge?

**A** Yeah. That was really the only way that we were going to get now to control the contamination that was in the system. Flushing and refilling and flushing, you know, that wouldn't have addressed that. There were multiple issues that we found investigating the system as well that were contributing to the problem.

**MR CONNAL:** Thank you.

**THE CHAIR:** And what I am rather gathering is that, as a matter of language, in April of 2018, everybody concerned was using the term "Contamination in the water system"?

**A** Mm-hmm.

**MR CONNAL:** Yes, the phrase that we have just looked at is, "Widespread water infection."

**A** Yes.

**Q** Can you remember: is that a phrase that recurs as you go through these minutes?

**A** Yes. I mean, the contamination, the water infection, they are, in effect, the same thing.

**Q** And it was agreed that it was widespread, i.e., not just confined to 2A or 4C or whatever?

**A** Yes. No, I think that's what we're talking about it. That's how we call it: systemic.

**Q** Yes, thank you very much. I will not trouble you with further minutes simply to the same effect, but can I bring you then back to your statement at 316, original 109, the second half of that

page? And here you are talking about chlorine dioxide, which you touched on earlier in your oral evidence, and you said an external specialist, Mr Wafer----

**A** Yes.

**Q** -- was brought in to help, is that right?

**A** Yes.

**Q** Is this something you were involved in, the development of the dosing system?

**A** Yes. I worked with Tim Wafer to take advice on his experience and what the best products were, and that was compared with other experiences from now Infection Control team, etc. In Glasgow, we had wide experience of using chlorine dioxide as an effective biocide. So, it kind of fell in line with what was expected.

**Q** Right. So, I am keen just to understand the process. I mean, one can understand if you are a householder and you have a single sink and you pour some bleach down it, that is what you may be trying to-- disinfect an individual item, but if you are looking at dosing the entire water system of the new hospital, is that a rather bigger operation?

**A** Yes. So, it's quite complex. Some systems, what they do is, especially if you're doing it from day one, they treat the water tank-- storage tanks, and then that disperses through the system and treats the system. Our system was already infected and it was very large and complex. It had, I think, something like nine different distribution systems within that fed from the same tanks.

So even if we dosed the tanks and then distributed that through the system, the likelihood is we couldn't dose it strong enough to get the end result at each of the taps. So, we looked at installing dosing systems on all the sub-systems so that they would then be getting the top up dosages. We would treat the tanks and then they would get topped up at each of the sub-distribution systems as well to maintain the appropriate level required to actively work on the contamination.

**Q** Yes, I think what I am trying to get at is how long did this take to put into operation?

**A** In terms of procurement and installation and then ramping the doses up?

**Q** Yes. Yes.

**A** Looking back at it, I think we managed to turn it round in something like six months, which was quite-- and that was-- and most of that was procurement, delays, etc., but that was quite a quick turnaround, I would say, especially having installed an operational within that time frame, considering the level of installation that was required.

**Q** And would I be right in thinking, as a matter of logic, that if you have widespread water contamination, although on day one you push the button on your shiny new dosing system, it takes a while for that to work to all the elements of the complex system, is that correct?

**A** Yes. Yes. Yes, so what happens there is the chemical is treated into the system and if you put it in, say, at 0.5 PPM with the expectation it's going to be lower than that at the outlet, what you do is you measure what they call the "Residual chemical" at the outlets to see how much chemical you've got left from the amount that you put in, and that gives you an indication of whether the chemical has been used up actively by combating whatever's in the system or whether it's coming out the outlet at the level you put it in, which means that there's no activity to combat. So that takes time to establish and to build up a residual that indicates that the product's doing its job.

**Q** Right. Are you able to offer any indication of how long, once you get to the point of deciding to do it, which is what, sometime in 2018?

**A** Yes.

**Q** After these investigations at the Water Technical Group, and you get Mr Wafer in and take advice, get onto procurement, you think it about six months to installation? I am just trying to get some kind of flavour of how long it gets-- it takes to get to the point where you have hopefully eliminated the problem.

**A** Well, the system went live in November 18, I think it was, and we were seeing positive indications that it was doing what we wanted it to do by about April/May.

**THE CHAIR:** When you say the system arrived, is that it online and operating?

**A** Well, the system- it was multiple systems, so we installed those and we put-- now, we installed them, I would say, over a three month window and they went live in November. So that means we put them online, not simultaneously, but within a day of each other and, as I say, I think around about April/May, we were starting to see indications that the sample results were improving and the residual chlorine dioxide measures were starting to stabilise. So that was indicating that it was doing what was expected.

**Q** Now, Mr Connal put to you a decision was made at sometime in 2018. I take it it was sometime after April 2018?

**A** Yes.

**Q** Can you estimate when the decision to implement dosing was made?

**A** I would say it would be about May because I think it was June that we

started procurement or worked towards procurement.

**Q** Thank you.

**A** And the procurement process was cut back as well because normally we would have to, a project of that size, would go through the OJEU process.

**MR CONNAL:** The what process?

**A** OJEU, it's the European Journal for Procurement.

**Q** Oh yes, the O-E-J-U.

**THE CHAIR:** That is the procurement regulation?

**A** Yes.

**Q** Yes.

**A** So, normally, we'd have to go through that and that would take six months just to do that on its own.

**Q** Yes.

**A** So we had shortcut that and went through a notification process for the European Journal, and we got sign off of what they call a waiver to tender by the chief execs to bring that process down and make it shorter.

**MR CONNAL:** Right. So you reckon about six months from, say, June to----

**A** Yes, I'd say May/June, yes.

**Q** -- being operational in November and then by May of 2019----

**A** Yes.

**Q** -- things are, you think, showing----



**A** Yes, I think there was confidence by then that it was doing what was required.

**Q** Thank you. We are just starting to head towards the point at which you retire in July of 2019.

**A** Yes.

**Q** I just want to ask you a couple of-- one definitional point. In your statement, 319, original, 112, you use the term, or the term is used, "Single barrier system" for water.

**A** Yes.

**Q** Now, again, I think we can probably take this quite short. Does that just mean that there is in place a single system for trying to ensure water is free from contaminant?

**A** Yes, like a control mechanism.

**Q** Yes.

**Q** In this case, it was temperature.

**Q** Yes, and what you set out on that page is your thesis that, "Well, there was a single barrier, but there could have been belt and braces system of dosing as well."

**A** Yes.

**Q** And possibly also these point-of-use filters in special areas?

**A** Yes.

**Q** Point-of-use filters comes up on the next page, 320, original 113, where you are talking about doing a

meeting, an IMT meeting on a Saturday.

**A** Yes, that was at the early stages of the highlighted concerns over patients and their bloodstream test results. So, it was a meeting on the Saturday – I think it was on the Saturday – to take advantage of access to a specialist-- trying to remember his name. Again, he was from----

**Q** Mr Hoffman, maybe?

**A** Peter Hoffman, that's it.

**Q** He is mentioned in your paragraph in your statement.

**A** Yes, thank you. So, I think that it was held in the Saturday to take advantage of his advice and access to his advice and, obviously, to mobilise a response as quickly as possible.

**Q** And you do not-- you know, you have asked, but you do not remember the precise date of that meeting, but you think it is at the early stages of what we are calling "The water incident"?

**A** Yes. At that point, we hadn't installed point-of-use filters anywhere. So this was the first point we were considering point of use filters for Ward 2A, and then that grew as we started to see other problems.

**Q** If these are a kind of guarantee that, whatever the state of the system, the water coming out of a particular tap is fine, why were they not in earlier, you know?

**A** Well, again, it's based on the fact that if you've got a system that's clean and doing its job, there's no need for them. However, there is a school of thought now that they should be installed in high-risk wards as a matter of standard.

**Q** Thank you.

**THE CHAIR:** Are there downsides associated with point-of-use filters?

**A** Sorry, say that again?

**Q** Are there any downsides, any disadvantages or problems that you have to manage?

**A** They've got to be changed at regular frequency depending on the type. You can get 31-day life, 61-day life, and I think there's a 90-day life filter. So you've got to have a replacement programme to ensure that you don't exceed that period. There's a risk of the users interfering with them or knocking them off the tap negating their value, and the only other one I can think of is financial cost.

**THE CHAIR:** Right.

**MR CONNAL:** Thank you.

**THE CHAIR:** Do they materially change the distance between the point of delivery of the water and the basin?

**A** Yes. Yes, they do, but in our case, the original taps were mounted about 500 millimeters above the wash hand basin, so putting these on we just

start by about 100 millimeters. So we still had an acceptable gap.

**Q** Right.

**A** In most cases. You get some small wash hand basins that aren't clinical that you didn't have the same scenario, and if these were being protected that would be more of an issue.

**THE CHAIR:** Thank you.

**MR CONNAL:** I just have a couple of questions I propose to put to the witness, then I am suggesting that time will come for the lunch break. There is just a couple of detailed points I would take first, if I may?

**THE CHAIR:** You propose before lunch?

**MR CONNAL:** Before lunch. Before lunch.

**THE CHAIR:** Right.

**MR CONNAL:** And then we come onto a topic afterwards.

**THE CHAIR:** There is a matter I want to take up-- well, with Mr Powrie as well, but carry on.

**MR CONNAL:** On 323, which is original 116, there starts a narrative and the narrative, essentially, is there is a suggestion that Estates, or you, or someone in an Estates would not give water testing results to doctors who asked for them.

**A** Yes.

**Q** Do you know anything about that?

**A** No. I've never been aware of that. I know that there were some glitches, but there was never any deliberate results being withheld.

**Q** Thank you. Well, I think, in fact, I would probably stop there, my Lord. So, if my Lord had a point, okay.

**THE CHAIR:** All right. Mr Powrie, can I just run you through points you-- I think you have made very clearly. So, in relation to Horne taps, so-- and tell me if I am wrong about any of this.

**A** Okay.

**Q** A situation arose in 2015, where there was a question about whether Horne taps should be used because of the experience in the Belfast hospital.

**A** Yes, pseudomonas guidance, yeah.

**Q** Right, and the question was, or the issue was, that this particular tap design was associated with accumulation of infection, and I think you mentioned pseudomonas if I am----

**A** Yes.

**Q** -- right. So, this was recognised in Glasgow in 2015, and the advice from the manufacturer of the tap was that chemical disinfectant would have made the tap ineffective, because-- or maybe am I mixing this up with removal of flow straighteners? Correct

me on this.

**A** There's two. The manufacturer's concern with the use of chemical sanitants----

**Q** Mm-hmm.

**A** -- was that they would adversely affect the materials in the tap. Now, they weren't saying that would happen right away.

**Q** Mm-hmm.

**A** They're saying, over time, the materials will fail because they're not resistant to the chemicals. The removal of the flow regulator, the guidance from HPS was that the flow regulator was a source of risk, and the recommendation is that they be removed.

Now, there was a caveat that they didn't need to be removed retrospectively-- Sorry, the taps didn't need to be changed retrospectively from existing hospitals, and that's, I think, what David Loudon focused on here, that they were installed in our hospital and, although we weren't open, it was still retrospective, but I think that was his thinking.

**Q** Right. So, a situation has arisen. I think you said there was maybe as many as 60 taps at various points in the hospital?

**A** Well, in one ward there may be 60 of these Horne taps.

**Q** Sorry, let me get my figures right. I put to you 60 taps, but maybe that is a gross underestimate. Is----

**A** Yes. There was about two and a half thousand----

**Q** Right.

**A** -- Horne taps.

**Q** But maybe 60 in one ward----

**A** In one ward, yeah.

**Q** Right. That is 2015. Now, you proposed a solution to or rather-- a means of sanitising which would have involved removal of the tab, take them to the workshop, and run through water at 70 degrees centigrade.

**A** Yes.

**Q** Right. That did not happen for a number of reasons, and between 2015 and 2018, the problem, which had been identified in 2015, simply was not addressed.

**A** No. No.

**Q** **T**hank you. Well, I think that takes us to about one o'clock, and if it is convenient to you----

**MR CONNAL:** Yes, indeed, my Lord.

**THE CHAIR:** -- Mr Connal, we will take our lunch break, and can I ask you to be back for two o'clock, Mr Powrie?

**THE WITNESS:** Okay, thank you.

**MR CONNAL:** Thank you.

**13:01**

**(Adjourned for a short time)**

**14:04**

**THE CHAIR:** Good afternoon. Now, Mr Connal.

**MR CONNAL:** Thank you, my Lord. For a variety of reasons, Mr Powrie, I am going to ask you some slightly random questions at the moment on a number of topics before I move on more logically through your statement. One question by way of clarification. We were talking earlier about the Horne tap saga, if I can call it that, and ultimately a decision to carry on with Horne taps was taken. Now, it has been suggested to me that the discussions about Horne taps may have been in 2014 rather than 2015. Can you help us?

**A** It was, yes.

**Q** 2014?

**A** Yes.

**Q** And can you remember at the time that a decision was taken to press on with Horne? Can you remember whether the taps were installed or on order, or what?

**A** Well, they were installed. I think that was part of the issue, that they were already installed.

**Q** Right. That is your recollection. Thank you. So, the decision was do not take them out, but look after them by maintenance?

**A** Yes.

**Q** And that is the regime that you have been explaining to us this morning?

**A** Yes.

**THE CHAIR:** All right. You explained to me that there was in excess of 2,000 taps. Were they all installed at that time?

**A** I believe so. I am not so sure about the Children's, but the Adults', certainly.

**Q** Thank you.

**MR CONNAL:** Can you remember, and tell me if you do not, when you first got in touch with Horne to discuss what could be done about the taps?

**A** It would have been - I'm trying to remember the date that the pseudomonas guidance came out. It would have been slightly after that.

**Q** Thank you. Well, we can no doubt check that if we need to. A couple of points, if I may, that just hark back to earlier evidence that you gave us. You remember looking at the Water Technical Group or Water Review Group, which ultimately concluded that there was widespread contamination discovered in all different floors of the building.

**A** Yes.

**Q** Can you remember whether any of the tests were from Ward 6A?

**A** I can't----

**Q** Sorry. Yes, 6A.

**A** I'm sure there would have been, because they put the 2A patients in there. So, they would have been checking the condition of the water there. So, I'm sure there would have been results. I can't remember the details.

**Q** Thank you. Another slightly random harking back to earlier evidence - point of use filters.

**A** Yes.

**Q** Do you know, as a matter of technical operation, whether they are effective against all pathogens, or some, or most, or what?

**A** They are classed as absolute filters. So, they should filter out all microbes.

**Q** Do you know different, or is that just what you understood at the time?

**A** Yes, that's my understanding of the filter classification. They're absolute.

**Q** I think I may have asked you this, but it-- so it may be my fault. If you have chemical dosing with chlorine dioxide of a system, which ultimately is what was done, does that have any impact on things like taps and fittings and pipes and so on?

**A** Potentially, yes. I had to do quite a lot of investigation into that in terms of the reaction to the pipe work, for example, as well as the fittings, and I think we had to get confirmation from each of the different manufacturers as to what level of chlorine dioxide could be safely used with their products and how that would affect warranty.

**Q** Thank you. This is essentially something to do with corrosion, is it?

**A** Yes, corrosion, primarily, yes.

**Q** Thank you, and one final question about dosing. We know you gave us a timeline of when you think it was procured and operational, and we know that you then retired in July of 2019. Can you remember whether there were any water incidents before you retired, notwithstanding the dosing?

**A** Recurrences of the same sort of incident, yes?

**Q** Well----

**A** I don't believe so. I think we were getting good results from the water and I don't think-- in the combination of that and the point of use filters, I don't think we'd have seen any patient implications.

**Q** Thank you. Now, I want to turn to a topic that we have touched upon briefly, which is the DMA Canyon report, which is a report in 2015. Now, I am not going to ask you to look at it. It is a substantial document, about a hundred and odd pages, if I remember rightly. I have got a bit in-- a big bundle here, and

you are asked about this at 326, original 119 of your statement, and you confirmed there that you had ordered it, which you have already told us today. Now, David Louden had asked you to order it, so presumably he knew that you were doing that.

**A** Yes.

**Q** You have also listed other people who you say knew you had ordered it.

**A** Yes.

**Q** Why did they know?

**A** Well, Mary Anne would have been notified because she was the bridge between operational Estates or operational Facilities and David Louden, acting as his interim director, and Billy Hunter was my direct line manager.

**THE CHAIR:** Could I just have that again? This is Mary Ann Kane's role. She would have been notified. She was the succession bridge----

**A** She was the interim director for Facilities acting on behalf of David Louden while he was still acting as project director.

**Q** Acting on behalf of----?

**A** David Loudon.

**Q** David Loudon.

**A** David was, in effect, employed to take on both roles but until he kind of completed the project director's role, Mary Anne acting on his behalf as interim director of facilities.

**Q** Thank you.

**MR CONNAL:** Right. Billy Hunter was your line----

**A** He was the manager. He was the general manager for South and Clyde facilities.

**Q** And why would the Project team know?

**A** The Project team would know through David Louden that we were doing the water risk assessment for the new build.

**Q** Yes, and then Mr Brattey, Mr Guthrie and Mr MacMillan?

**A** They would know because they were working for me and they were aware of the requirement and the fact that we'd have to review the outcome.

**A** Yes, and then you go on to confirm that the report came to you, and you gave copies to Mr Brattey and Mr Guthrie. You were responsible for paying for it, and you were then asked at the foot of that page, "What did you do when you got it?"

**A** Yes.

**Q** I think you have actually told us this already, that you had a meeting with, was it Mr Watson from DMA?

**A** It was, and there was one of his colleagues. His name escapes me at the moment.

**Q** And I think two of your

colleagues. I think there was a suggestion it should have been three, but somebody could not make it.

**A** Melville MacMillan. I think he had-- like, I can't remember if he was on holiday, but he wasn't able to attend.

**Q** And what you said was that at that meeting there was a brief overview. What did that mean in practice?

**A** They kind of ran through some salient points that they felt were worth noting. For example, the calorifiers that were used for domestic hot water weren't flow-through. By definition, that's a requirement under the SHTM requirements. So, they highlighted that these weren't flow-through and should be, and therefore they weren't compliant.

**Q** Yes. The next question is probably an awkward one, but you are asked, you know, "Did you actually read the report?"

**A** At the time, I didn't, no.

**Q** Yes, we know you were subsequently made aware of it at a much later stage.

**A** Yes.

**Q** But you did not read it, and you accept in your statement you should have read it?

**A** Yes.

**Q** And in terms of the physical location, because you had hard copies, you kept hold of it and your colleagues took a copy each. Is that right?

**A** That's correct, yes.

**Q** Then you narrate a discussion with Mary Ann Kane about appointments that you have already told us about today. The question really is, "Why didn't you do something more than just, you know, give it to your colleagues?"

**A** Yes. I mean, well, I gave it to my colleagues and instructed them to work on a plan, an action plan. So, it wasn't just giving them a copy.

**Q** Sure.

**A** But equally, I think it's-- taking it into context of what was going on at the time, we were still in the process of migration. We had all these other problems that were arising on a daily basis and my focus wasn't on this. My focus was elsewhere.

**Q** And, in fairness to you, you accept that you should have done more with it?

**A** Yes.

**Q** And then there is a specific question as to whether someone - you or one of your colleagues - should have shared it with Infection Control?

**A** Yes.

**Q** And what is your view on that?

**A** Well, certainly I should have escalated it to, first of all, David Loudon, who asked me to commission it, and then secondly, it should have been shared

with Infection Control. It's a moot point whether that should have been me as responsible person or the authorised person. Either one of us should have done it.

**Q** You tasked your colleagues, Mr Brattey and Mr Guthrie, to get on with it and get on with the plan. You have told us that you took it on yourself to ask Mary Anne Kane about formal appointing, but you did not hear back?

**A** I didn't, no.

**Q** Did you hear back from your colleagues with a plan?

**A** No. There was-- I was expecting them to come back with an action plan and a methodology for implementing that. The action plan wasn't just in relation to the risk assessments. In relation to the written scheme of maintenance, which is probably more important in terms of how we would implement that written scheme of maintenance that was prepared by DMA. However, they prepared the bones of it. We've got to put the detail in about how we're going to manage it and how we're going to meet the requirements of the written scheme. So, that's what I was expecting back from David and Jim.

**Q** Yes. Do you know, from your direct knowledge, whether they were doing anything at all with this?

**A** I didn't have a kind of direct



meeting with them to go over and follow up on where things were. I had ad hoc discussions with David Brattey to be told that they were working on it, etc., but again, I can't remember the timeline for that and how long that went on, but certainly it was lost over time in terms of the thrust to drive it forward.

**Q** I think, if we could go to 328, original 121, just at the foot there is a reference to seeing them using your office.

**A** Yes. They were having meetings with DMA with a view to carrying out the work that I'd asked them to do, and they used my office as a meeting room. So, I knew that they were actually engaging.

**Q** Should you have had some kind of process in place----

**A** Yes.

**Q** -- to alert you to the need to follow up?

**A** Absolutely, yes.

**Q** Did you not?

**A** No.

**Q** Did you get any indication of what had been done or not in relation to the instructions you had given to Mr Brattey and Mr Guthrie?

**A** No, I never got any formal feedback or any engagement to bring me up to speed on progress or status.

**THE CHAIR:** I mean, just if I am

following you, Mr Powrie, what you expected Mr Brattey and Mr Guthrie to come back to you with was a written scheme?

**A** Yeah. Well, the written scheme populated with all the relevant data----

**Q** Right.

**A** -- and that data would be including how we were going to address the issues from the action plan, and the written scheme requirements to comply with the statutory guidance.

**Q** My fault, the action plan is something different than the written scheme?

**A** Yes. The written----

**Q** The written scheme is something we see referred to in L8, I think.

**A** Correct.

**Q** Right. The action plan is more-- is what, just something you wanted to----

**A** Well, action plan was really to address the issues that were highlighted and the risk assessment as being non-compliant, or needing attention, like removal of dead legs, that kind of thing.

**Q** Mm-hmm.

**A** So, I wanted an action plan in how we were going to carry----

**Q** Right.

**A** -- that forward. Some of that may have been reported as defects, failures to meet design requirements, so I was looking for that to have been recorded and actioned as well.

**Q** Right, and the action plan is just a GGC list of things to do?

**A** Yes.

**Q** Right, thank you.

**MR CONNAL:** According to your statement at 330, you eventually read this in 2018?

**A** Yes, yes.

**Q** Having had the chance to do it, as it were, retrospectively, did that concern you when you saw what it said?

**A** Yeah, obviously, I would-- at that point, I realised that I dropped the ball.

**Q** Let me just ask you about a few other documents that are associated with this question. Can we look at bundle 12, page 110, please? Now, you were asked about that on page 330 of your statement. Is that anything to do with the DMA Canyon report? Does it pre-date it, post-date it? Can you tell?

**A** No, that was dated before the report was issued, and it was based on concerns highlighted by DMA, issues that they needed information for to be able to complete the risk assessment in its entirety, from their point of view. They actually-- I don't think we ever got a response to that, and they submitted the

risk assessment without having access to this data.

**Q** Thank you. This is when DMA are-- they have been in site, or they are on site, and things have cropped up and you have been asked to follow them up?

**A** Yes.

**Q** Thank you. Can we look at bundle 25, page 684, please? Now, this appears to be a communication from DMA to you in June. So, is that after the report, then?

**A** Yes.

**Q** It contains quotations for doing various works. Do you remember getting that?

**A** No. I don't recall receiving that at all. That, to be honest is-- that document goes on to show a schedule of actions from the written scheme, and that, in part, is what I was expecting to be brought back to me by David and Jim, in tandem with DMA, for us to sit down and review how we would deliver that. So, this partly covers what I was expecting, but I don't remember receiving this.

**Q** Right. I think it may be suggested if you had got that, that would have been a good reminder that----

**A** Yes.

**Q** -- DMA was somewhere lurking around needing action.

**A** Yeah, it would certainly have prompted a meeting, and then from there, obviously, we'd have to have assessed how we would implement what they were proposing, because obviously this is commercial from their point of view. Whether we could afford on an existing budget to do that would need to be assessed and established.

**Q** In the same bundle, can we have page 706, please? Now, this appears to be from-- now, is Allan McRobbie from DMA?

**A** He's DMA. He was party to some of the meetings, I think, that were going on, because he was-- I think he was the risk assessor that was carrying out the work.

**Q** All right. This is actually slightly earlier communication----

**A** I think this was----

**Q** -- Is that before the thing is delivered to you?

**A** Sorry, I think this refers to the document you showed prior to----

**Q** Ah right----

**A** So----

**A** -- but this is the first document.

**A** Yeah, in relation to the email I sent David Wilson.

**Q** Yes. Do you remember getting that email?

**A** I do, because I didn't have the feedback from David to be able to update him on that.

**Q** Right. Page 708, please, and

here is another email. So, this seems to be a point of detail----

**A** Yes.

**Q** -- rather than to do directly with the report. Is that correct? Do you remember that one?

**A** I remember the issue. I'm sure that I provided information to highlight that it wasn't a wet cooling system. They were concerned that the cold water feed to it made it a wet system, which required notification under the HSE requirements, but it wasn't the town's main water feeding the chiller. It was a backup. Should the main system fail, they would go into town's mains water to cool, and that would be dumped directly to drain. So, it wasn't what they call as a wet cooling tower.

**Q** Anyway, you remember the issue, but you----

**A** Yes.

**Q** Rather than anything else. 710, please. Now, that, presumably, is something to remind you about the issue of calorifiers.

**A** Yes.

**Q** Do you remember getting that?

**A** I remember the-- Yeah, if I remember the email, I'm not sure, but I remember the issue. We were having problems with boilers shutting down, and that was having an impact on system temperature.



**Q** Yes.

**A** And Jim, Mel, and others were dealing with that as it occurred. So, from that point of view, I passed the responsibility for addressing the failures to Jim and Mel, I think it was.

**Q** Okay. 712. Now, this is an earlier one, in fact. Do you remember it?

**A** I think this is, again, the precursor to the email from Allan----

**Q** Right.

**A** -- about the same list of questions that I submitted to David Wilson.

**Q** Okay. Finally, in this particular run from that bundle, 714----

**A** And, again, I think that's part and parcel of the questions that were submitted to David Wilson.

**Q** Thank you. Yes, I see. Can I ask you to look, in this general connection, at bundle 12, page 263? Now, this appears to be an email from Peter Moir. Who was he?

**A** Peter Moir was the project-- the deputy director, and I think he was contract lead.

**Q** Yes, and David Wilson is Multiplex?

**A** Yes.

**Q** It is not a principal contact, from what you have been telling us.

**A** Well, David Wilson was the commissioning manager.

**Q** Oh, right.

**A** So, that would be the reason that he's the contact for most of these issues.

**Q** Right. Now, in terms of timings, I suppose we should look up from the bottom of the email chain. At 7 July, 11.13, is Craig Williams – that is the Infection Control lead – to various people, presumably raising the issue of sealing rooms, which I think you know something about, but I do not need to take it from you at the moment. Then, in the middle of the page, you are then asked about various things. Is that right?

**A** I can't see that just now.

**Q** Sorry. So, there is a heading, "Original Message," from Mary Anne Kane, 7 July, 2015, 12.13. Have you got that?

**A** Yeah, I've got it, yep.

**Q** That is sent to you and to Peter Moir, headed, "Schiehallian Testing." It starts, "Well, we need to get all the validation data of HEPA filters."

**A** Yes.

**Q** "Otherwise, we are going to lose all these areas from use unless we provide this data, which will be a PR nightmare."

**A** Yes.

**A** Well, first of all, do you remember that email?

**A** I don't specifically remember the email, no.

**Q** Because, in the next paragraph, it starts, "Ian" – so that's you – you're required to ensure that Christine" – that would be Christine Peters – "gets the Legionella paperwork today."

**A** Mm-hmm.

**Q** Could that be a reference to the DMA Canyon report?

**A** I'm not sure.

**Q** Do you remember getting that request?

**A** I don't.

**Q** Thank you.

**THE CHAIR:** I take the point that you cannot necessarily remember, but----

**A** Yes.

**Q** -- are there any other contenders for Legionella paperwork in July? I think we are looking at July of 2015.

**A** It could have been the commissioning validation data. It could have been DMA, but it doesn't say that-- Now, if it was the risk assessment she was talking about, I thought she would have said "risk assessment." So, I don't know if it's the commissioning data she's talking about.

**Q** Can you maybe just help me with that? The expression is "Legionella paperwork."

**A** Yes.

**Q** Now, to me, that does not

suggest a connection with commissioning, but perhaps it should.

**A** It could have been encompassing both. It could have encompassed both. It could have been all the Legionella paperwork.

**Q** Right, thank you.

**MR CONNAL:** Now, let me just check another couple of documents while I am here. Can we go back to bundle 25, please, page 678? Now, this is actually addressed-- it is a communication address to Mr Purdon----

**A** Mm-hmm.

**Q** -- but it appears, at least from the heading, that you have been copied in. Do you remember that?

**A** I haven't seen this as part of the evidence so far, so I'd need to-- give my wee minute to read it. (Pause for reading) No, I don't remember seeing this. This is with respect to an occupation risk assessment after the hospital's been occupied.

**Q** Yes, because the date on that is November 2016, so----

**A** Yeah.

**Q** -- we are at a slightly different time frame. So, I was just wondering whether you knew anything about it or not.

**A** I wasn't involved at all in the revised risk assessment. Is that the 2017 risk assessment?



**Q** Yes, I am going to come to that in a moment----

**A** Yeah.

**A** -- but you have no recollection of seeing this?

**A** No.

**Q** Just finally in this sequence, can I have bundle 18, volume 2, please, 872. Now, this appears to be an update of a written scheme for Legionella control produced by DMA Canyon. Do you know anything about that?

**A** No.

**Q** Were you----

**A** To be honest, I didn't even know that this existed. I thought the next one was 2017. So, I haven't seen this.

**Q** Yes. Now, let me just ask you about that, because you touch on that in your statement at page 332, original 125, where you were asked about the 2017 report, which is bundle 6, 416. Now, this appears to be an L8 risk assessment based on site surveys in September 2017 and October '17 with a meeting in January '18. Do you know anything about that?

**A** No.

**Q** Were you involved in its production?

**A** No. I mean, I know about it retrospectively, but I didn't know about it at the time. I think it was 2018, once we started having issues, that I found out

about this.

**Q** Right. Can we just scroll onto the next page of that document, please? You will recognize the DMA contacts, Mr McRobbie, Mr Kinghorn, Mr Watson----

**A** Yes.

**Q** -- and then the report is said to be commissioned by Tommy Romeo.

**A** Yes.

**Q** Would that be logical from what you knew was going on?

**A** Yes. Tommy was the chap I referred to earlier, who came into the role as acting authorised person.

**Q** Okay. Can I just go back to your statement? Because we probably get to the crux of this. On 332, you are asked:

"Well, what was the impact of not dealing with the 2015 assessment when it came in?"

And you say:

"Well, it was a missed opportunity to sort the problems."

**A** Yes.

**Q** And you accept that?

**A** Yes.

**Q** Thank you. In fact, we know that there was some kind of investigation. We will hear from, I think, a Mr Leiper who did an investigation, and you have told us in your statement that you were interviewed and then you were told no action was being taken.



**A** Yes, at a later date. That was over a period of time.

**Q** Thank you. Right. Unless my Lord has further questions on DMA Canyon, I am going to pass on that.

**THE CHAIR:** No.

**MR CONNAL:** Thank you. In the remainder of your statement, Mr Powrie, you deal with a variety of issues in which you had involvement of one kind or another, some of which we have touched on, like the water incident and the water groups, and some of which perhaps we have not. So, I am only going to ask you a limited number of questions. I am not going to take you to everything in the remainder of your statement. So, if you just bear with me.

Just for the record, my Lord there is further discussion about on taps and what was and was not done and so forth at 343, original 136, and 344. So, I might just ask you one question about that since I have got it in front of me. So, it is 344, sorry.

We have been through this stuff about the taps and what happened and what the issues were, but is the result of all these exchanges recorded in the end of the big paragraph at 344, starting with a sentence, "David Loudon was of the opinion..."? It is about two-thirds of the way down.

**A** Yes.

**Q** As a matter of reality – although that paragraph ends with you saying, "Well, he did not discuss the implications for maintenance" – the fact of the matter was that you were expected to do maintenance on these taps----

**A** Yes.

**Q** -- to keep them safe.

**A** Yes.

**Q** Is that correct?

**A** Yes. What I did on the back of that was produce a risk assessment to continue using the taps along with Sandra McNamee at the time – I think her name is Sandra Devine now – and the health and safety manager, whose name escapes me at the moment. It'll come back.

**Q** What conclusion did that assessment reach?

**A** Well, the risk assessment just really spelled out the fact that we had a modern water-- and bear in mind this risk assessment was 2014, before we started to find the issues that we had-- that it was a modern, well-engineered system, as we thought, and that the controls would be now a sanitisation service exchange model, just as we've discussed, and the detailed timelines for those to be implemented as well. I'm sure I shared that with DMA, and I shared it with David Brattey in line with the request to have the workshop and test equipment



installed.

**Q** I suppose it might be suggested to you, the unfortunate thing is that having decided to press on with the taps and engage in a sanitisation programme, the sanitisation programme then did not get done----

**A** Yes.

**Q** -- for one reason or another, you have explained to us, and you eventually hit the water incident?

**A** Yes.

**Q** Am I right in thinking that ultimately, at least in some locations, the Horne thermal mixing taps were actually replaced with another brand----

**A** Yes.

**Q** -- that you had suggested?

**A** That would be Ward 2A.

**Q** Right.

**A** And that was a precursor. There was at the time discussions about rolling that out to all high-risk areas, but we'd certainly replaced the taps in Ward 2A with, I think it was the Markwik 21 TAP, which unfortunately is the tap that was used in Ireland, but a modified version of it to address the issues that arose there.

**Q** About the flow straighteners, was it not?

**A** Yes. They changed it to what they call a bioguard flow regulator, which is an open bore with copper lining, so it

doesn't have the same complications and risk of developing organisms on the outlet itself.

**Q** In fairness, there is a paragraph in your statement that deals with this. I should probably refer you to that, which is at 346, the large letter A in the middle there. It probably just says largely what you have just said, a new TMT Markwik 21 copper-lined bioguard----

**A** Yes.

**Q** -- to meet-- And when you say SHTM 04-01 guidance, that is guidance following the Northern Ireland outbreak, is it?

**A** Sorry, say that again?

**Q** That guidance that you are referring to there was issued following the outbreak in Northern Ireland that caused the concerns?

**A** Yes, that was an update in relation to the the HPS guidance.

**Q** Thank you. I have some questions for you, Mr Powrie, that will be not necessarily connected by neat joins in other questions, so bear with me again. Do you remember a Dr Lee being in the hospital carrying out some investigations?

**A** Susan Lee, yes.

**Q** And she was there because of some issues arising in Ward 2A and water. Is that correct?



**A** Yes.

**Q** The question I am just trying to get from you: do you remember an occasion when she was looking for data and the data had all disappeared?

**A** Was that the temperature logs?

**Q** It could well have been.

**A** Yes, I think it's referring to temperature logs. So, the building management system, BMS, has-- monitors all the hot water flow and return temperatures, and these are relevant because you've got to make sure that you're above certain thresholds on both flow and return, and the monitor then should highlight if there's a deviation so that action can be taken.

She wanted to review those documents to see if there had been temperature-- a loss of temperature control regime and what the impact would be. Unfortunately, we couldn't provide them because the BMS server had failed and we worked-- we asked Schneider, who were our service provider, to try and retrieve those files from the server. Unfortunately, they couldn't do that, so we didn't have the data to provide.

**Q** Just while I am on that topic, I think you have probably gathered from a question I put to you earlier today that there is at least a suggestion by some people that Estates were not keen on

giving results to the microbiologists.

**A** Yes.

**Q** Now, you said you had no recollection of ever refusing to give results?

**A** I'd never refused to give results that were asked for. So, I had a good working relationship with Infection Control Doctors and the Infection Control Team, the nurses, and invariably, anything they asked me for, I provided.

**Q** Thank you. Can I have a bundle 14, 258, please? Check what this is. Now, do you recognise this email, which comes from Teresa Inkster, one of the Infection Control or microbiologists, to you, copied to various other people? Do you remember what this was about? Because it says late 2016.

**A** The last sentence there kind of triggers my memory. I had produced-- As part of the SHTM guidance, there's a requirement to carry out additional what you call verification as opposed to validation. So, annually you're meant to verify the ventilation systems are still performing as per the original commissioning and design.

So, I think this was relating to a schedule of defined high risk areas that I had prepared and shared with Teresa for consultation, and one of the items that were on that was the mortuary specialist ventilation. So, Teresa wasn't particularly interested in that because it wasn't clinical. So, she was quite comfortable to take that off the schedule from an Infection Control point of view. I think that's what this document refers to.

**Q** Thank you.

**THE CHAIR:** My fault, could you repeat what you said about verification? You were distinguishing verification and validation. Could you just-- I was not sure where the obligation comes from and what it relates to.

**A** Well, we know that the commissioning validation is part of the installation handover process.

**Q** Yes.

**A** Verification is a requirement for, operationally, once a year, to verify that the air handling or ventilation systems are performing as they were commissioned and validated. So, just make sure that nothing's changed and that we're still getting the same performance, and that there's no risk to patients from a drop off in performance.

**Q** And is the source of that obligation SHTM 03-01?

**A** Yes.

**Q** Thank you.

**MR CONNAL:** Thank you. On 354, original 147, you narrate what sounds quite a dramatic incident when the whole water system-- it is near the foot of that page-- that the whole water system

seemed to have failed.

**A** Yes.

**Q** And action had to be taken about it. I see, on 355, you just had to bypass the filters and fill the tanks up so that there was----

**A** Yes.

**Q** -- water in the system.

**A** Pretty much. There was no-- the filters were lock out. We hadn't had training on the filters at that stage.

**Q** Yes. So this is April 2015?

**A** Yes. So it's just as migration started. So there were some patients in the hospital but there was only a handful of wards occupied.

**Q** Right. So, why did you report to David Loudon on this, I see, from 355?

**A** Well, I was still working-- we were part of the Migration team, so we were all in a suite of offices together in the hospital, and at that time, I hadn't transferred over to reporting directly to Billy Hunter, although there was still a link there. I was working with Billy on operational issues but it was because it was a plan failure on the newly commissioned installation that I reported to David in terms of contract issues.

**Q** But you also say there that you did not flush and drain the system after the refill----

**A** No.

**Q** -- because you did not have enough people to do it.

**A** No. That's a massive undertaking to drain and empty the whole system, flush it-- fill it up again, flush it and then drain and fill it again, and the potential impact to the migration programme.

**Q** Now, do you know why the filters were not working?

**A** Ultimately, we had the engineer on site first thing the next morning, and the pre-filter on the membrane filter banks were blocked. So they had been operating since the filters had been installed-- since the filter banks had been installed. So that would be months, and they'd never been changed. So they recommended that these filters should be changed weekly.

**Q** Right. So they have been operating for months?

Yes.

**Q** Once you get this problem, you then discover you should be doing it much more frequently?

**A** Yeah. Well, the thing is that, as I say, we hadn't had training and hadn't-- that level of detail would not normally be in my scope but the fact that we got the engineer come out and assess the lockout as being a pre-filter, and a pre-filter that should be changed routinely, weekly, that had been installed and commissioned and had been

changed since.

**Q** Okay. In your statement at 358, you move on to some ventilation issues. Can I ask you this question? Do you know whether there was an authorised engineer ventilation at the time of handover?

**A** No. We hadn't appointed an authorised person, no. Or are you talking about authorising engineer?

**Q** An engineer, yes.

**A** No, I don't think we had one until well into 2016. The authorising engineer for ventilation was a relatively new requirement. We always had authorising engineers high voltage, low voltage for these risk systems-- now risk to personnel, but the authorising engineers for water systems and ventilation systems is a relatively new requirement, and it had just been rolled out for Glasgow as a whole at that time.

**Q** Can I just ask you, before we go on to ventilation then, another wider question, are you familiar with the concept of HAI Scribe?

**A** HAI Scribe, yes.

**Q** Do you know whether there was a stage 4? And it is under SHFN 30, HAI Scribe prior to handover or patient occupation?

**A** I'm not aware of it.

**Q** Does that mean you do not know whether there was one or you just do not know?

**A** I just don't know.

**Q** Thank you. Can I ask you just briefly, I think, about the events at Ward 4B where, to put it colloquially, the team from the Beatson turned up and said they were definitely not happy with what they were being offered, and went off again back to the Beatson?

**A** Yes.

**Q** That must have been quite an event presumably for a unit like that basically to turn up and say, "This is just not good enough. we are not having it. Go away."

**A** Yeah.

**Q** We know that some works were done about that but if there had been validation of the ventilation in Ward 4B, would that have happened?

**A** Possibly, because the validation would have been based on the design, and the design was as it was. I don't know how the design got accepted but, yeah, I think it possibly would have.

**Q** Right, and the other thing I wanted to ask about that before I move on to the point you have just made is-- the focus was on, you know, the standard of ventilation and the standard of rooms.

**A** Yes.

**Q** As I understand it, did that not ring alarm bells about what the whole hospital might be like?

**A** I don't think it did because Ward 4B was originally meant to be a standard ward with chilled beams in the rooms and three air changes, as we now know, for a standard room. It was changed to accommodate the BMT patients, but it was only changed to achieve six air changes rather than 10, and there was very little positive air pressure from the room to the corridor, which doesn't meet the requirements for those types of patients either.

So, I don't think that ward being wrong would have rang alarm bells for other wards because that was now modified, supposedly, to suit the patient group that was now being placed there.

**THE CHAIR:** Are you able to tell us the timing of this? You said that Ward 4B, which came to be designated the adult bone marrow transplant ward, had originally been planned as a general ward. Are you able to say when a decision was made to use it as a bone marrow transplant ward?

**A** I would be clutching at straws in terms of a time scale. I know it was before-- now it's moving-- before 2014, but I couldn't say when.

**Q** Before handover?

**A** Yes.

**Q** Right. Are you able to say who would be involved in the-- first of all, the decision to change the use?



**A** I think the decision was a corporate decision – a board decision – in terms of the change in strategy for the placement of A&E and ITU adjacencies for the patient group. So, they were trying to align the patient group with sites that had those services, and I believe they were closing A&E at Gartnavel, where the BMT came from. So, they tried to realign the facility to the Queen Elizabeth to ensure that A&E services and ITU services existed on the same campus.

**Q** So at some stage, somebody thought that the ventilation specification for B required to be changed?

**A** Yes.

**Q** Do we know when that happened?

**A** No. Well, I don't. It's-- That would be the same time scale because the ventilation would not have suited those patients as was originally designed.

**Q** Sorry, give me that again, please.

**A** The ventilation that was originally designed for Ward 4B was standard – that's all the other wards – three air changes, no air differential pressure, chilled beams. So, that obviously wasn't suitable for BMT patients. So the need to redesign it to accommodate BMT patients. It would have came along with the decision to

move the patients from that level.

**Q** And an acceptable solution was thought to be six air changes rather than four?

**A** Yes. Rather than three, but yes.

**Q** Yes. With no specific provision for change in the pressure differential?

**A** There wasn't much in the way of a pressure differential from those rooms at that time, and they had included HEPA filtration. So they had acknowledged the need for a higher air change rate and HEPA filtration but that was the extent of the ventilation changes.

**Q** Right. So, a decision was made to make some change but if this was to accommodate neutropenic patients, which I assume the bone marrow transport patients are, it should have been 10 air changes, 10 Pascals of positive pressure, and HEPA filters?

**A** Yes.

**Q** Yes. Right. Thank you.

**MR CONNAL:** I think we know that the work on 4B was not led by you. It was led by someone else.

**A** Peter Moir.

**Q** Peter Moir, and you were not involved, according to your statement, in either specifying what was to be done or delivering them.

**A** No.



**Q** Is that correct? Although, to pick up his Lordship's point, if we look at 364 of your statement, original 157, if we just go into that first answer, you were invited for a familiarisation session, etc., etc., and then you note at the end of that answer:

"This was only betterment towards the required standards and still did not meet the full requirements of SHPN 04 supplement 1."

**A** Yes.

**Q** Did you ever-- In the course of your contact with the 4B issue, were you ever able to work out what the specification had been to which the ward had been built that some people were not happy with?

**A** Yeah. No, I'd never seen the specification or-- I was never able to understand what the specification was or who signed off and approved on it.

**Q** Yes. Can I ask you about Ward 2A? Am I right in understanding that concerns about the environment in 2A – air changes and other issues – arose fairly early in 2015 after occupation?

**A** Yeah. Well, again, it depends because there was two aspects to that. Are we talking about the isolation rooms or the general Ward 2A and TCT ward.

**Q** The general one?

**A** General ward. Yeah. Both

Infection Control and Professor Gibson had raised concerns that the environment wasn't what they had expected for the patient group.

**Q** You may or may not be able to help us with this, but we have had evidence-- and we know you were involved in getting reports from specialists in 2018, which then led to a consultant's brief and then work later. Can you help the Inquiry at all as to why when people like Professor Gibson were saying this is not up to scratch in 2015, it is only in 2018 that anything substantial is being done?

**A** I really can't because I wasn't-- no, I wasn't party to those discussions. The project, as far as I understand it, were of the opinion that the clinicians from Ward 2A had said they wanted a similar environment to what they had at Yorkhill, and that they felt that that's what they delivered with the installation that we ended up with. They reckon that was the brief-- same environment as Yorkhill but, as far as I can see, it wasn't the same environment.

**Q** And why not?

**A** Well, Yorkhill had positive pressure control cascade between the rooms and the corridor and the external corridor to the ward itself. I can't say what air change rate they had because I wasn't party to it at Yorkhill but there was certainly a higher classification there.

I couldn't personally understand the correlation between "the same as Yorkhill" and what we would eventually call it, because it wasn't the same as Yorkhill.

**THE CHAIR:** It was less rigorous.

**A** Yes.

**MR CONNAL:** Can I just ask you, because you had started to give me an answer which dealt with two matters, I asked you about the general issues in the ward and you said, "Well, what about the isolation rooms?"

**A** Yes.

**Q** Was there a different issue about the isolation rooms?

**A** Well, the isolation rooms, as you started off, were the lack of HEPA filters, which we've discussed; and then secondary to that, working with John Hood and Craig Williams, we were looking at the room integrity, so that's the air tightness of the room, and what we were finding was that we were getting air movement from the external environment into the room. Now, that could be around the windows or the service ducts. Even when you've got the trunking or light fittings, we were getting air movement between ceiling voids into the room, and this was highlighted through the Project team, and the solution to that was deemed to be that they would bring in

specialist silicon sealant contractors to seal all of these services to make the room airtight.

Now, on top of that, what I established was that the commissioning validation didn't carry out what are known as air permeability tests, which test the airtightness of the room, and they didn't carry out HEPA filter tests, challenge tests, on the HEPA filters.

The air permeability should have been carried out in two stages during the installation and design. Once the envelope had been created it should have been sealed and air permeability tested to prove the envelope was intact. In other words, you've got no air ingress from adjacent rooms or adjacent floors. Then, once the shell of the room had been installed, it should have been air permeability tested again to ensure that that remained the case and that the finished room was airtight and you couldn't get extraneous air coming in to risk contamination of the patient.

**THE CHAIR:** Right, that sounds-- I am sorry to keep asking this sort of question but it helps me understand the context we are in. What you are describing in relation to air permeability sounds to me like commissioning, in other words something you are doing before the completion of the hospital.

**A** Yes.



**Q** Now, the obligation to carry out these two-stage tests that you just described, where does that come from?

**A** The obligation to do that is SHTM again.

**Q** Again, is it SHTM 3?

**A** For this one, I think we'd be referring back to SHPN 4, supplement 1, because that's what the isolation rooms were supposedly designed to.

**Q** Right, okay. Am I right in thinking that SHPN 4 is referred to in SHTM 03-01?

**A** Yes, for isolation.

**Q** I could be wrong about that, but----

**A** I think it is for isolation. It'll just be a reference for further details, refer to that document and vice versa, because-- I may be straying off topic, but the SHPN is meant to be for isolation rooms within general ward facilities where you've maybe got an infectious patient or a neutropenic patient who needs to be protected. It's not meant to be for a known neutropenic ward environment, which should be a different guidance that doesn't exist at the moment.

**Q** Right, and again, just if I am remembering correctly, the SHPN is-- I mean, if you go to it, it is a description of the way you set out the isolation room; and your memory, at least, is that either in the SHPN or in the SHTM 03-01, which

refers to the SHPN, there is a requirement at commissioning to carry out these two tests, and in this case this was not done.

**A** Correct.

**Q** Right. Sorry to be so pedestrian about it, but I kind of need a context.

**A** It's a bit convoluted.

**Q** Sorry, Mr Connal.

**MR CONNAL:** Not at all, my Lord. Can we have bundle 12, 343, please? Can we look at-- Leave that for the moment. Look at page 375, original 168 of your statement. It is just to pick up whether there was a completely different issue about isolation rooms that you had spotted, and it perhaps picks up on the point his Lordship has made about where you get guidance on isolation rooms.

**A** Yes.

**Q** I see here you start by saying:

"My concerns were that the PPVL design used in 2A did not comply with the guidance design intent within SHPN 04, supplement 1, specifically in the volume of extract being drawn above the bed with only a small extract from the en-suite."

And then you quote sections from the guidance. What was this about?

**A** In the guidance, it kind of advises that if you change any component of the description for operation of one of these rooms, a PPVL room, then you'll change the validity of how the room performs. So, in effect, here what happened was that the extract, total extract, is meant to be from the en-suite toilet with the supply being supplied through the entrance lobby and then that supply air spills into the room through a spill grille – it's a grill above the door – and provides the air volume and the air change rate that the room requires. That's then extracted through another spill grille into the en-suite toilet through the extract in the en-suite and that gives you a clean to dirty air cascade so that the patient's never exposed to air coming from the dirty side of the equation.

So, what Multiplex did is they put the majority of the extract in the patient room, the protected room, and they put a smaller extract in the en-suite. That's to provide compliance with building standards for dirty facility extract rates. I challenged that, and Multiplex's response was, "The guidance allows for the extract to be in the patient's room." But they picked on a tiny, wee clause that says, "If there's an extract in the patient room, this is what you've got to do." My understanding is that if you put the extract in the patient room, it should only be partial extract and it should be at the patient's head, generally where it's an infectious patient, to help pull any of their expirations away from the patient and

staff working at the patient, so you're protecting that zone. It's not meant to be on the ceiling, drawing most of their volume away from the en-suite. That might sound complicated, but----

**Q** Well, it no doubt is very simple to anyone who is a ventilation expert or perhaps an Estates individual, but basically, you were saying that you did not think the isolation rooms had been designed in accordance with the way in which they should have been designed.

**A** In accordance with that guidance, no.

And Multiplex initially were arguing about it.

**A** Well, Multiplex argued the case right through. They never changed their position.

**Q** I see further down page 375 that you had discussions with Craig Williams, Infection Control, and then you went off to try and find other PPVL rooms in other hospitals to see what story you got from there.

**A** Yes.

**Q** Did that turn out to be helpful?

**A** I kind of highlighted that there was variations in design compliance in other sites as well. It wasn't just this site. The other sites didn't have a totally compliant design as per that guidance. They all had variations of it, the ones that I could get information from, anyway. I think it was Leeds who were the main contributors.

**Q** Right, thank you. Now, while I am conscious we are at 10 past three, I have a few more questions still to go. I wonder whether it might be appropriate just to see if any other participants want to speak to me about questions before we head into that section.

**THE CHAIR:** Right, so if I am following you, you still have questions?

**MR CONNAL:** I still have some questions to put, yes.

**THE CHAIR:** Right, but you would appreciate the opportunity just to consult with----

**MR CONNAL:** Well, I am just anxious to know whether I can simply continue and we will probably take up much of the rest of the time and then we will finish----

**THE CHAIR:** Right, but it is essentially knowing how much time you have available to you.

**MR CONNAL:** Yes.

**THE CHAIR:** Right. Well, okay. Well, 10 minutes. What we are going to do is break for 10 minutes and I will ask that you be taken back to the witness room, Mr Powrie, in order, essentially, to manage the rest of the afternoon.

**THE WITNESS:** Okay.

**(<u>Short break</u>)**

**THE CHAIR:** Thank you. Mr Connal.

**MR CONNAL:** Thank you, my Lord. I have come to a topic I probably do not need to spend time on, Mr Powrie, because we know that there was a process whereby Mark Lambert of IDS was asked to design-- sorry, to comment on a series of matters in relation to the Ward 2A and 2B, and in the course-- he told us yesterday that, in the course of his work on that, he had various conversations with you, after which what he was going to put in his report expanded a bit from the original draft. Did that-- be a fair summary?

**A** Yes.

**Q** The only thing I wanted to ask you about that, because we know that, subsequently, work was instructed, was in your statement at 376, the second half, you say it was Tom Steele that asked you to look at this issue. Is that right?

**A** Yes. Yes.

**Q** I think Mr Lambert had a recollection that he had a discussion with Mary Ann Kane and Alan Gallacher and then it came over to you.

**A** Matt hasn't-- he'd done several pieces of work but this particular piece of work for Ward 2A, it was Tom Steele that asked me to look at the possibility of improving the ventilation rates with the existing plant and to take that forward, and then it was Tom that instructed to go with a full consult-- a full design after we got the results of this report.

**Q** Ah, right.

**A** So Mary Anne and Alan had commissioned-- I can't remember-- there was ongoing works that Matt was involved with before this, and I think that was Alan and Mary Anne, but this part was Tom Steele.

**Q** Okay. Am I right in understanding from later parts of your statement that, by the time it came to following up Mr Lambert's report and then his briefs and then the appointment of contractors, you had retired by the time it was all done?

**A** I got to the stage of putting the tender out for the new design team----

**Q** Right.

**A** -- and we had agreed to use Mark Lambert as the shadow design, for want of a better description, to act on behalf of the board to verify that what was being proposed would meet our requirements. So yes, we went out to tender, we-- I think we had appointed the consultants and then the process was taken over by the capital projects team as I was retiring.

**Q** Thank you. One of the things that Mr Lambert told us about yesterday was what he perceived to be a risk in

critical areas if you only had one air handling unit available----

**A** Yes.

**Q** -- because of what would happen if it went off.

**A** Yes.

**Q** So, I was looking through your statement to see if I could find any reference for an air handling unit actually going off as opposed to precaution, and I see you deal with that on 381, which is 174 in the original. Was this actually air handling units just going off completely?

**A** Yes, this is-- I think, just let me check. Yes, this one was a-- it was actually a control fault that caused-- it was a, what they call a network controller, and what happened is that two air handling units had tripped off and we attempted to reset them but they wouldn't reset. We-- I contacted Multiplex, I think it was Julie Miller who responded, but she couldn't engage with Schneider Controls because their contacts weren't available. So I used our service support contract route to bring an engineer on site to look at it. He established it was a network controller fault but, in the meantime, another four units tripped out.

So we were now sitting with six air handling units feeding isolation rooms. So they've got one unit dedicated per room. So we ended up with six units offline. What he managed to do, because we couldn't get the units to go on hand and operate manually, he managed to divorce the units from the controller so that we could make them manually operated and we maintained the room conditions on a manual setting, and it took them a couple of days, I think it was, to establish the cause of the fault and then order a replacement controller. So I think it took about best part of a week to resolve the issue and get the units back online automatically.

I don't think that's the same issue as you're talking about with Matt. Matt's talking about a ward, like Ward 4B, because it's the same scenario as I have raised concerns about for Ward 4B. You've got a critical ward with multiple rooms supplied from a single air handling unit.

**Q** Right.

**A** If their handling unit goes into fault, then you've got multiple patients affected. So if you've got 24 isolated patients, they're all affected by this and they're all at risk.

**Q** I can understand that, but I suppose it raises a similar point. You had a number of rooms that suddenly became----

**A** Yes.

**Q** -- untenable as patient rooms, is that right?

**A** Yes. So, the issue there is to

get the-- reinstate their supply as quickly as possible or relocate the patient.

**Q** Yes. So, I think to an extent, in those rooms, I think room 18 and 19, the patients were relocated but then we had several other rooms fail. Now, luckily, I don't think the ward was fully occupied, so they managed that, but if it was a fully occupied ward, that would be a problem.

**THE CHAIR:** Right, so what you would suggest is at least desirable is one air handling unit per room?

**A** For isolation facilities, ideally.

**Q** For isolation----

**A** Or you could have-- if it was, for example, Ward 4B, you could have one air handling unit as your duty air handling unit and then a standby, so if that fails you switch over to another unit and that supplies the whole ward, and that then gives you the ability to respond to failures and to carry out your annual verification because you've got to shut the plant down to do that anyway. So it gives you that-- and I've covered all that in my Ward 4B scenario.

**Q** Thank you.

**MR CONNAL:** Well, this is quite a good segue – thank you, Mr Powrie – into a couple of questions that I think I took from you in part when you about 4B, but probably did so reasonably swiftly. So, could we go to 406, original 199, of your



statement? What you are being asked about there is Peter Moir saying that Ward B was ready for handover, and that means handover a fresh if I understand it?.

**A** Yes, the second time.

**Q** The second time.

**A** Yes.

**Q** And you are asked what you thought about that and you say:

"Well, this was not fully compliant, but with the equipment that was available, it could not be."

**A** Yes, it was better than----

**THE CHAIR:** Sorry, my fault. What page were we at?

**MR CONNAL:** Sorry, 406 in the bundle----

**THE CHAIR:** 406, thank you.

**MR CONNAL:** -- but 199 of the original. Just a question I have been asked to check: in the next section you were asked, "Well, did it meet the guidelines?" You say, "No, but," and you say:

“I was led to believe that the proposed upgrade works were agreed with the Clinical Oncology team to meet their requirements within the limitations of the existing build.”

Do you know who told you that?

**A** No.

**Q** Thank you. The other point, just while we are on 4B, you said you had

not been able to work out what the design parameters were for 4B when it was first attempted to be given to the Beatson after the instruction for change. I now find your reference to that on 408. Basically, what you say was you had a look at the records that were available, but you could not find anything that helped you----

**A** No.

**Q** -- and it did seem a bit more like a standard ward than anything else?

**A** Yes.

**Q** Yes. Thank you. Let me ask you two questions that relate back to something you said earlier before I do anything else. In one of the firefighting lists that you gave us very early on in your evidence, you talked about sewage spills into ward areas. Do you know if that was reported to Infection Control?

**A** Yes. I'm sure it would have been. It would have been reported by the clinical staff right away, because that would have been a risk perceived by them, but we would have reported it to them as well. I didn't report it personally, but yes, it would have been reported.

**Q** The other question that arises from earlier evidence is, we went through the DMA Canyon report and you explained what you did and did not do with it, and then you said you first it in 2018----



**A** Which one?

**Q** The 2015 DMA Canyon report. You then saw it for the first time in 2018 or read it for the first time in 2018.

**A** I read it for the first time. I was given a copy in 2015.

**Q** Yes, sorry.

**A** And I might have at that time read the summary, but I didn't read the full report. So, 2018 was the first time I sat and read the full report.

**Q** We are just trying to-- Can you tell us at all when that was? Because we know, for instance, there was a water incident in 2018.

**A** Well, I think that was the catalyst, because by then I wasn't involved in the Operational Estates for the Queen Elizabeth. So, the catalyst for me to review that was the fact that we're having the water incident, and then I was asked, "Did you have this report?" because nobody seemed to be aware of it, which I understand. Did I have that report and now could I share it? And then that led to the internal investigation, etc. So, that would have been the catalyst for me reviewing it at that time.

**Q** So, you had moved into the job of assisting Mr Gallacher in the wider role in January 2017?

**A** Yes.

**Q** It was only when you were drawn back into the water incident that

this-- Is that what you are telling us?

**A** Yes, yes.

**Q** I have also been asked to pick up with you-- It was no doubt not a small point at the time, but on 413, which is 206 of your original-- Sorry, 413, not 143. My fault. You asked at the foot of that page about mould behind-- What are IPS panels?

**A** It's an integrated plumbing service panel. So, basically it's a boxed-in section with your clinical wash hand basin on it and the pipework is behind that boxed-in section.

**Q** Right. What you say there is there may have been slight mould issues, and that would usually have been the result of a small, unidentified water leak. Is "slight" an accurate description of what you found?

**A** Yes. I mean at that time, now, if there was mould that was relating to maybe a small leak on a coupling-- so, when you've got water and moisture, mould tends to develop. So, if there was any leaks in these IPS panels, that would be the reason for it. I know that's developed into a bigger issue but, again, that's after I retired.

**Q** Right. Thank you. I just wanted to ask you a couple of things about the topic of pigeons, which I think you know cropped up in connection with the question of Cryptococcus being possibly or possibly not the cause of infections. This issue cropped up, as I understand it, primarily in 2018, by which time you were off into your different role. In the time before that, were you aware of any problems with pigeons?

**A** There's a kind of general issue about controlling pigeons on most sites, but this site in particular, because of the the tower, I think, there seemed to be a bigger population, but the-- We had an issue over at-- I'm trying to remember the name of the building now. In one of the buildings over in the far corner, there was an old tower in there and there were pigeons roosting in there and we had to get that cleaned out, decontaminated, and sealed up.

There was an issue on the maternity link corridor to the Children's hospital, where pigeons were roosting inside the link corridor. There had been a gap left at the bottom side of it. Multiplex removed the panelling, we got pest control to remove the pigeons, and then that was sanitised and reinstated and the gap sealed. So, that was an issue there, but neither of those were directly affecting ward accommodation.

**Q** Can I just ask, though, was the control of pigeons under your remit when you were the Estates manager?

**A** No, the control of pigeons was part of the soft FM team's remit. So, they

managed the pest control elements.

**Q** Just help those of us who do not have these things. The difference between hard FM and soft FM is----

**A** Hard FM is the Estates function. Soft FM is like hotel services, portering, domestics, that kind of thing.

**Q** Right. In the section of your statement dealing with this, which is 417, original 210, you say that although you were not involved operational management, Darryl Conner had been tasked to investigate, and then you ended up in a visit. How did that transpire?

**A** I think Christine Peters asked me to go and have a look, and she took me up along with Darryl to the plant room that the pigeons had-- there was a pigeon ingress-- to let me see what was there. When I went up with Christine, there was very little evidence. There was some slight fouling and some feathers, but there was nothing major at that time. Certainly not anything like the pictures I've seen as part of the evidence bundles.

**Q** Well, that is what I want to ask you. You said you did not see very much.

**A** Correct.

**Q** You also say in your statement you were not shown any photographs at the time.



**A** No.

**Q** Can I ask you to look at bundle 12, 1236, please? Can we just scroll down? Because there were some photographs at the end of this, I think. Now, the photograph we are looking at there, I think it is supposed to show a dead pigeon lurking in that dark place.

**A** Oh, yes, I can see it. I thought that was a shadow, but yes.

**Q** And then the next page, please.

**A** Yes, that's----

**Q** There seem to be quite a lot of----

**A** That's quite bad.

**Q** -- pigeon----

**A** I didn't see anything like that.

**Q** This is not something that you saw when you were asked to come in and help out?

**A** No. Is this the same timeframe, these photographs?

**Q** We would have to scroll back up to make sure we are getting that correct. This is 2020, but what you saw was not similar?

**A** No, nothing on that scale at all.

**Q** Thank you. You had retired by 2020?

**A** Yes.

**Q** You will be pleased to know I have not much more to ask you, but I did want to ask you about one comment to

see if we can track it down. If we go to 419, which is original 212, and what is happening is, this is near the end of your statement, and the questioner has gone back to the question of workloads and staffing and so on that you have told us about in the course of your evidence. You told us earlier about some of the responses you got, you know, "Stick with the budget. No, we cannot do anything about it," and so on, from earlier in the day.

**A** Yes.

**Q** But in an answer you gave here, you said when you raised a concern, you were "advised that the CEO/SMT"-- which is, what? Senior Management team?

**A** Yes.

**Q** "...expected that Multiplex would be providing maintenance during the warranty period." Who told you that?

**A** David Loudon.

**Q** David Loudon?

**A** Yes. That was part of his feedback in terms of the management strategy paper and the-- reverting to the original budget figures. So, he was telling me what the conversation was and the fact that there is an understanding from the chief executive and the Senior Management team that Multiplex will be maintaining the site for the two years and that there's a-- How do I put that there?



And that the maintenance requirement should be less because it's a new, modern building. The maintenance requirements would actually be extremely high compared to the old sites now, because they're completely fitted out with modern technology. Now, hundreds of air handling units, massive water--- The maintenance requirements were substantially more than they would have been on any of the other sites, but they had an appreciation because it was new and because it was state of the art, maintenance would be less.

**Q** You did not think that was right?

**A** No, and I did explain that to David and he seemed to take it on board, but I don't know if it made a difference.

**THE CHAIR:** Sorry, they did seem to take it on board?

**A** He seemed to take it on board, but I don't know that he managed to use that to any effect to increase the budget.

**Q** What is meant by providing maintenance in this context?

"I was advised that the [chief executive officer/Senior Management team]"--

Now, first point: advised by the Senior Management team?

**A** No, no, I was advised by David

Loudon----

**Q** Advised by David Loudon----

**A** -- that that was the view of the Senior Management team and chief exec.

**MR CONNAL:** The sequence, if I am right, without interrupting my Lord's questions--

**THE CHAIR:** Please.

**MR CONNAL:** The sequence is you, among other things, had gone to David Loudon and said, "This is ridiculous. I do not have enough people. I have budgeted for 111 or thereabouts, and you are telling me the budget will not stand that," and you are basically complaining to him about what the consequences were.

**A** Yes.

**Q** And he goes off, you understand, at some point to discuss it with-- I think you mentioned the Chief Executive, Mr Calderwood----

**A** Yes.

**Q** -- earlier in your evidence, but we do not know who, and then you are getting a feedback. Is that the sequence we are talking about?

**A** Yes. David was letting me know the justification for not getting the budget that we had indicated was required, and part of his feedback was maintenance will be less and it's under warranty and it's a new, state-of-the-art property that will have less maintenance



requirements than an old run-down property, and it's the flip of that. That's not the case.

**THE CHAIR:** Can I repeat my question? What is meant by maintenance in this context?

**A** Maintenance of the campus. All aspects of maintenance.

**Q** So-- Well, help me. You were in the maintenance business.

**A** Yes.

**Q** I mean, what are we thinking about, wear and tear? I mean, if----

**A** Yeah. Well, you've got consumables, for a start, so all your ventilation plant. The filters need to be replaced at regular intervals. Now, normally, you would do that on a time basis but, with this plant, it actually tells you when the filters are starting to get close to needing to be replaced. So, you'll get an alarm condition saying, "Filters are at 75 per cent," for an example.

So, we have got to then have the filters in place to be able to go and change those, and then we need the staff to be able to do that. You need staff to be able to go and do all the monitoring, flushing, all the works that are identified in the water risk assessment that are required to be done routinely. You need enough staff to do that. I think we ended up with something like eight plumbers.

We'd need 20 plumbers to be able to do the level of work that was required from these documents.

**Q** I appreciate you are simply being told by Mr Loudon what he has been told by----

**A** Yes.

**Q** -- other people, but just listening to what you have said in explaining to me what is meant by maintenance, that seems quite a high proportion of the maintenance requirements of the new building----

**A** Yes.

**Q** -- because you are including, for example, routine replacement of filters.

**A** Yeah, yeah, just any consumable. On any system that's got consumable components, and given the volume that we've got there, that's a big task just to keep that going.

**Q** All right. So, assuming Mr Loudon's right, the Senior Management team thought that the two-year warranty, or the two-year----

**A** Was covering all those aspects as well.

**Q** -- snagging period or whatever, covered the sort of routine maintenance that you have been describing.

**A** Yes. It didn't, but that's what the feedback was.



**THE CHAIR:** Thank you.

**MR CONNAL:** My Lord, that seems an appropriate point to indicate that I have no further questions for this witness.

**THE CHAIR:** Can I just check with the room that any requests to Mr Connal have been dutifully discharged? Right. I am taking that as a yes. Thank you very much, Mr Powrie. You are now free to go. Thank you for your attendance today, but I appreciate just attending today was just a small portion of the amount of work you have done to help the Inquiry. Your statement is extensive and very helpful, so thank you for being here today, but also for all the work that you are required to go through in order to be here today. You are now free to go, and I will ask----

**THE WITNESS:** Thank you, your Honour. Thank you.

**THE CHAIR:** -- Mr Forbes to take you out.

**(<u>The witness withdrew</u>)**

**THE CHAIR:** My understanding is no more witnesses today, but a witness tomorrow.

**MR CONNAL:** Yes, my Lord. We have Alan Gallacher tomorrow. There was some debate as to precisely how long he will be. I think the original intention was to make sure we finished them by lunchtime.

**THE CHAIR:** Mm-hmm.

**MR CONNAL:** It may still be possible to do that, depending on how the answers go, or it may be that it will spill, in which case not a full day, though. It might just be a question of spilling over into the afternoon.

**THE CHAIR:** I am proposing to take a slightly longer lunch break tomorrow, but that does not present any problem, does it?

**MR CONNAL:** I can't see why it should, my Lord.

**THE CHAIR:** Very well. Well, thank you, everyone, and good afternoon.

**(Session ends)**

**15:51**