Grenfell Tower Inquiry

Day 160

July 13, 2021

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(10.00 am)

SIR MARTIN MOORE-BICK: Good morning, everyone. Welcome to today's hearing. Today we're going to hear evidence from a representative of tRIIO, which was the body instructed by Cadent Gas to fit the new riser in Grenfell Tower.

Yes, Ms Grange.

MS GRANGE: Yes, Mr Chairman. Can we call Mr Matthew Dolan, please.

SIR MARTIN MOORE-BICK: Thank you.

MR MATTHEW DOLAN (affirmed)

SIR MARTIN MOORE-BICK: Thank you very much. Now, do sit down, make yourself comfortable.

(Pause)

All right?

THE WITNESS: Yeah.

SIR MARTIN MOORE-BICK: Good, thank you.

Yes, Ms Grange.

Questions from COUNSEL TO THE INQUIRY

MS GRANGE: Yes, thank you.

Could you give the Inquiry your full name, please.

A. It's Matthew John Dolan.

Q. Thank you, and thank you very much for coming to the Inquiry today to assist us with our investigations.

It's very much appreciated.

If you have any difficulty in understanding any of the questions that I ask you today, please just ask me to repeat the question or I'll put the point in a different way.

We will take scheduled breaks today. If you feel you need an additional break, please just say.

Please try and keep your voice up so that the transcriber, who is sitting to your right, can take a nice clear note of your evidence. Thank you.

A. Okay.

Q. We have two witness statements from you.

If we can go to the first, this is at {MET00012711}. This is a statement dated 5 February 2018 which you gave to the Metropolitan Police. It's 18 pages long. We'll call that your first statement.

Can we also pull up your Inquiry statement, this is at {TRI00001797}. So this is the statement that you made to the Inquiry. If we look at page 10, we can see it's dated 5 October 2018, and is that your signature there?

A. It is, yes.

Q. Have you read both of these statements recently?

A. I have.

Q. Thank you. Can you confirm that the contents are true?

A. They're correct, yeah.

Q. Thank you.

Have you discussed the evidence you're going to give today with anyone before coming here this morning?

A. Only people directly involved in putting the statement together.

Q. I see.

A. Yeah.

Q. Were those your lawyers?

A. Lawyers, yeah.

Q. Thank you.

Now, we know that you were involved in the Grenfell Tower project because you worked for the entity that we know as tRIIO; is that right?

A. That's correct.

Q. What sort of entity was tRIIO, can you explain?

A. Yeah, tRIIO was a joint venture between Morrison Utility Services and Skanska Construction. It was awarded an eight-year contract at the back end of 2012 to deliver, amongst other things, gas mains replacement, multiple occupancy building and connections work for National Grid --

Q. Yes, thank you.

A. -- which later became Cadent Gas.

Q. Yes, that's very helpful, thank you.

It was formed specifically to bid for contracts with National Grid; is that correct?

A. It was, yes.

Q. As you've just mentioned, we know that in 2016 National Grid changed its name to Cadent. We'll call it Cadent today in the questioning.

So we know that, on 18 December 2012, tRIIO was awarded the contract for gas distribution services in the North London region for Cadent; is that correct?

A. It was, and also the East of England. So there was two contracts that were awarded: one for London network and one for the East of England network.

Q. Yes, thank you. And that contract was known as the gas distribution strategic partnership, the GDSP; is that right?

A. That's correct.

Q. And it was an exclusive contract for tRIIO to do all the work in defined regions; is that correct?

A. Yes.

Q. And you've mentioned already, and Mr Harrison told us yesterday, that the term of that contract was for eight years.

A. That's right, yeah.

Q. Yes. Is it right that that came to an end, it terminated by expiry, in December 2020?

A. Yes.
Q. And is it right that tRIIO as a joint venture doesn't exist anymore?
A. That's correct.
Q. Yes.
Now, you helpfully set out a summary of what tRIIO was contracted to provide in your first witness statement, if we can go to that at page 2 {MET00012711/2}. So that's your Met statement, and I want to look at paragraph 10.
You tell us there —— it's right at the bottom of that page, if we can blow that up.
A. Yes.
Q. You say:
"Under the Contract, tRIIO carries out work in London to replace existing metallic gas mains with new polyethylene gas mains, lay new gas mains and install new connections. Work is done on the instruction of Cadent, which owns the gas network. This includes providing a design and construction service for replacement gas networks in Multi—Occupancy Buildings (MOBs) of which around 80% of the MOBs programme works arise from reports from the public and others relating to gas leaks (reactive works) and the remaining 20% relate to planned replacement programmes (proactive

works)."
Now, we've heard from Mr Harrison yesterday, and I just want you to confirm, that the gas riser works which tRIIO carried out at Grenfell Tower started at the beginning of October 2016, but had not been completed by the night of the fire in June 2017; is that correct?
A. That's correct.
Q. Just to be clear, it's right, isn't it, that tRIIO did this work to the gas pipes at Grenfell Tower under the strategic partnership contract?
A. Yes.
Q. And tRIIO provided the design for those works; yes?
A. Yes.
Q. And also managed the construction services for those works?
A. Yes, we did.
Q. Yes, thank you.
In that paragraph that we just read, paragraph 10, in the second sentence, second line, you begin there by saying, "Work is done on the instruction of Cadent". Can you just explain precisely what you mean by that?
A. So in the context of the reactive MOBs programme, we would have been issued with what is known as a client brief, a MOBs pro forma, which is an instruction to commence the design and construction activities

associated with the replacement of the gas riser that had been cut off due to public—reported gas escape.
Q. Yes. Once you take on responsibility for that design, is it fair to say that you're not being instructed by Cadent about the design, it's up to tRIIO then to plan that design work; is that correct?
A. Yeah, we were the designer, the principal designer, and the principal contractor for that work.
Q. Yes.
In terms of your role, can you just help, when did you start working for tRIIO?
A. I started working on the tRIIO contract on 1 April 2013. I joined as a programme and compliance manager ——
Q. Yes.
A. —— and then became a contract director, I'm just going to get it right here, in terms of the start of year 4, which would have been 2016.
Q. Yes.
A. 2016.
Q. Yes. So we've got in around April 2016 ——
A. Yes.
Q. —— you became contract director; does that sound right?
A. That's right, yes.
Q. From March 2018, did you become director of operations?
A. I did.

Q. Yes. Thank you.
Now, just going back again to your first statement, this time one page on on page 3 {MET00012711/3}, if we look at paragraph 11, you tell us here:
"At any one point in time, tRIIO has approximately 500 projects ongoing, of which around 20 to 30 can be MOBs [multi—occupancy buildings] projects. I am one of two of tRIIO's Contract Directors responsible for the delivery of the overall programme of works, with part of my area of responsibility relating to the design and construction of the MOBs projects for both the London and East of England Networks."
Now, just to clarify, at the date you made that statement, you were still a contract director at tRIIO ——
A. I was.
Q. —— is that correct? And that was your role at the time of the works at Grenfell Tower; is that correct?
A. It was.
Q. Yes.
You tell us there that there were two contract directors. Can you just help, how was the role divided up? Did you have different areas of responsibility?
A. Yeah, so my area of responsibility, I looked after operations for the London network, and I had design,

health and safety responsibility for both the London and East of England network, and then my counterpart had operational responsibility for the East of England, plus he looked after customer services and some other activities. But my responsibility was London network operations, design for both contracts, London and the East of England, plus health and safety for both contracts, London and East of England.

Q. Yes, thank you. That's very helpful.

Can you just keep your voice up a little bit, because it's dipping down a little bit at the end, just so we can get a clear note. Thank you.

Typically, how many multi-occupancy building projects would you be looking after at any one time?

A. So at any one point, as in my statement, around 20 to 30, predominantly in the London network. In fact, the vast majority of the MOBs projects were in the London network.

Q. Yes.

In terms of the Grenfell Tower project, what direct involvement did you have, first of all, with the design of the new riser at Grenfell Tower?

A. So I would have had very little direct responsibility -- sorry, I had overall responsibility, but in terms of day-to-day delivery of the design and construction work,

that would have been discharged through my team.

Q. Yes.

What about the construction work at Grenfell Tower? Again, what was your direct involvement in that?

A. Very similar to the design. So I would have had an operations manager responsible for the delivery of the project and a design manager responsible for the design of the project.

Q. Yes.

A. So they were direct reports of mine.

Q. Yes.

Is it right that you did have some involvement during the works when problems were escalated to you?

A. Yeah, so there were specific problems that occurred, notably an asbestos incident that occurred in one of the flats, and I would have been notified of any complaints that would have been escalated to me, if they couldn't be resolved by my team.

Q. Yes, thank you.

Now, in terms of your own background, is it right that you're a gas engineer by training?

A. Yes. I started in the gas industry in 1988 and spent 25 years working for British Gas, Transco and National Grid, before joining the tRIIO contract in 2013.

Q. Yes, thank you.

Is it right that you did your training at National Grid before it became Cadent?

A. I did, yeah.

Q. Yes. When did you commence that training?

A. Training was ongoing throughout my 25 years working for National Grid and its predecessor company. So depending upon the role I was undertaking, training would have been involved in supporting me in the delivery of that particular job or those particular jobs.

Q. Yes, thank you.

In 2010 you took on the role of engineering manager at National Grid; is that right?

A. Yes, it is, yeah.

Q. Was that a senior role within National Grid?

A. Yes, it was a senior management role.

Q. Yes, thank you.

So, to summarise, before you started working at tRIIO, you'd worked as a gas engineer for over 25 years.

A. Yeah, I joined the gas industry when I was 21 in 1988.

Q. Yes. Thank you. Are you still working in the gas industry?

A. I am, yes.

Q. Yes.

Now, I want to ask you a little bit more now about

the relationship between tRIIO and Cadent.

We heard from Mr Harrison yesterday that Cadent, as a gas transporter, has statutory duties, for example in connecting customers to gas and keeping the pipeline in safe and efficient working order.

Now, is it right that the contract with tRIIO was designed to assist Cadent in fulfilling those obligations?

A. Yes.

Q. And under that contract, tRIIO was Cadent's contractor; is that correct?

A. Yes.

Q. Now, it's also right, isn't it, that the relevant gas regulations themselves are in functional form, ie they set out goals; is that correct?

A. That's correct, yes.

Q. So rather than prescribing exactly what the gas transporter has to do, they set out these functional requirements?

A. Yeah. Yes.

Q. Yes.

Is it right that, in order to achieve those goals, the industry frequently refers to a range of different guidance, including HSE guidance, industry technical standards, and other British and European standards; is

that correct?
A. Yeah, there'll be a hierarchy of documentation, specifications that we would refer to.
Q. Yes.
Mr Stephen Mason of Cadent has provided several witness statements to the Metropolitan Police and to the Inquiry. He was the operations director for Cadent.
I just want to look at something he says in one of his statements, if we can bring that up at {CAD00003005/3}, and I want to look at paragraph 11.
He says:
"This Contract [that's the one between Cadent and tRIIO] underpins the relationship between Cadent and tRIIO and sets out the contractual relationship for this 8 year period. tRIIO, as contractor for works under the Contract is required to comply with all statutory requirements (including CDM Regulations (as defined in paragraph 16 below) and any obligations imposed by the Health and Safety Executive or Ofgem), relevant British or European standards or codes of practice, and best practice guidelines in respect of health and safety as are applicable to the activities carried out under the Contract."
Now, do you agree with what Mr Mason says there in terms of ——

A. Yes.
Q. Yes, thank you.
Just to be clear, the best practice guidelines that he's referring to around five lines down —— he says, "best practice guidelines in respect of health and safety" —— would, for example, the publication IGEM/G/5 be classified as good practice guidance?
A. Yes.
Q. If we go over the page in his statement to page 4 {CAD00003005/4} and look at paragraph 12, he says at the beginning there:
"As part of the contract, tRIIO is required to work in accordance with a number of Cadent's policies, procedures and industry standards which includes IGEM/G/5."
You tell us in your second witness statement —— I don't think we need to turn it up —— at page 6 {TRI00001797/6}, paragraph 23, that tRIIO applied the IGEM/G/5 standard when designing and constructing the gas supply replacement works; is that right?
A. That's correct.
Q. You also tell us that this summarises best practice and guidance from legislation and existing gas industry standards and procedures for gas installations in multi—occupancy buildings; is that correct?

A. Yes.
Q. Yes.
Just help us, I think we heard yesterday, but IGEM, for those listening, is the Institution of Gas Engineers and Managers?
A. That's correct.
Q. Is it right that IGEM issues technical standards for the gas engineering industry?
A. Yes.
Q. We can see IGEM/G/5 —— it's an exhibit to Mr Hancox's report, he is the Inquiry's gas expert —— at {RHX00000005}.
We can see that this is the second edition of IGEM/G/5, "Gas in multi—occupancy buildings". This version was issued in 2012 and was the current issue at the time of the gas replacement works at Grenfell Tower. Is that your understanding?
A. Yes.
Q. Yes, thank you.
I think you agree, but just to confirm, you agree that tRIIO was required to work to this standard and meet the technical requirements that it set out?
A. That's correct.
Q. Would you have expected the tRIIO design team to have been familiar with it?

A. Yes.
Q. Now, under the Building Regulations regime, there was also practical guidance in the form of a number of approved documents, including something called Approved Document B on fire safety.
Were you familiar with that document at the time you were responsible for the Grenfell Tower design works?
A. I was familiar with the Building Regulations but not specifically the Approved Document B that you reference.
Q. Yes. Would you expect that those at tRIIO who were designing the works, the replacement riser works, would have been familiar with Approved Document B insofar as it has sections relevant to gas works?
A. I would have expected the design team to be familiar with the document. I'm not sure I can answer whether or not they would have been specifically —— understood that particular section.
Q. Yes.
A. They would have recognised the Building Regulation, but maybe not the fire safety order section that you referenced.
Q. Right. Yes.
Let's just pull up Approved Document B. It's at {CLG00000224}.
There it is. It's quite a long document. It

contains a lot of practical guidance.
Just to be absolutely clear about your answer, you would have expected the tRIIO designers to have been familiar and aware of this document; yes?
A. They would have been aware of the Building Regulations document, yes.
Q. When you say "aware of the Building Regulations document", do you mean this practical guidance or do you mean the Building Regulations themselves?
A. Building Regulations themselves.
Q. Right.
A. Yeah.
Q. So they will have been aware of the functional requirements in the Building Regulations?
A. Yes.
Q. Yes, but not necessarily familiar with this detailed practical guidance?
A. That's correct.
Q. Yes.
Is it right that, in 2016 and 2017, a gas engineer would have referred primarily to the IGEM standards in terms of health and safety?
A. Yes.
Q. Would that be the only guidance document that a gas engineer would have referred to in their work, or would

there be other guidance documents that you can think of that were likely to come up more frequently?
A. To clarify, in the context of the MOBs programme of works, the design team and the operational team would have referenced IGEM/G/5.
Q. Yes, thank you.
Is it right that, in 2016 and 2017, tRIIO designers would have believed that if their design complied with the technical requirements of IGEM/G/5, then it would also comply with all other relevant standards?
A. That is correct, yes.
Q. Yes.
Now, we saw reference to the CDM Regulations, the Construction (Design and Management) Regulations, in Mr Mason's statement, and I think you accept in your first statement that the CDM Regulations applied to the work of the strategic partnership contract; yes?
A. Yes, yeah.
Q. It's right, isn't it, that as part of your contract with Cadent, tRIIO had designated roles and had to abide by the CDM Regulations? Is that correct?
A. Yes.
Q. For the Grenfell Tower project, do you recall which particular CDM roles tRIIO had under the 2015 CDM Regulations?

A. I do, yes.
Q. Yes, what were those?
A. Principal designer.
Q. Yes.
A. Designer.
Q. Yes.
A. And principal contractor.
Q. Yes, so all three distinct roles ——
A. Yes.
Q. —— TRIIO held those; is that correct?
A. We did, yes.
Q. Yes.
Now, we know that the role of principal designer was a new role created in the 2015 regulations, that had not existed previously.
Can you help us, what training did tRIIO undertake to take on this new role when the new regulations came in?
A. Cadent approached us when the new duty holder role came into place to take on that role. We engaged the services of an external consultant, namely Arup. Arup came in and reviewed our business processes, our health and safety documentation, our capability, and they produced what in effect was a gap analysis report, which identified those parts that we currently complied with

and therefore could take on that role, and the parts that we would have to do some additional training and development of processes to enable us to fulfil the full role.
Q. Yes.
A. There was a plan, that plan was actioned, and then we were in a position to take on the role of principal designer.
Q. Yes.
A. And that was agreed contractually with Cadent.
Q. Yes, thank you, that's very helpful.
Had that plan all been actioned by the time the Grenfell Tower project started?
A. It had, yes.
Q. Yes.
So did tRIIO take steps to make sure that somebody with the necessary CDM competencies was engaged in any particular project?
A. Our design team, in the context of the design, fulfilled both CDM training and also training in G/5 when that was issued to us.
Q. Yes.
If we could look again at your first statement, your Met statement, at page 4 {MET00012711/4}, paragraph 20 this time, you tell us there:

"As Principal Designer, tRIIO had responsibility to plan, manage, monitor and coordinate health and safety during the pre-construction phase and to liaise with the Principal Contractor during the delivery of the construction work."

Now, as principal designer, would you accept that tRIIO had a duty to assess the health and safety risks throughout the lifecycle of the whole project?

A. Yes.

Q. So not just at the beginning, not just at the end, but actually throughout the works itself?

A. Throughout the works and post-completion, for any inspection and maintenance that would be needed for the pipeline once commissioned.

Q. Yes.

Can we agree that the principal designer has other duties, such as assisting the client with preparing pre-construction information?

A. That's right, yeah.

Q. Monitoring the construction phase, co-ordinating health and safety matters during construction?

A. Yes.

Q. And identifying, eliminating or controlling foreseeable risks?

A. Yes.

Q. Thank you.

At the end of a project like this one, where more than one contractor was involved, the principal designer prepares the health and safety file and passes that completed file to the client; is that your understanding?

A. That is correct.

Q. Now, as you've mentioned, tRIIO was also a designer for the purposes of the CDM Regulations.

If we look again at your first statement, now at paragraph 21, same page {MET00012711/4}, you tell us that:

"As Designer, tRIIO's role was to prepare and modify the design in relation to the in ground works and riser pipework at the Tower. In performing that role, tRIIO's designers took account of pre-construction information provided by Cadent to try to eliminate foreseeable risks to the health and safety of those working on the project, the residents and others affected by the works. In circumstances where the risks could not be eliminated, tRIIO's designers took steps to reduce and control those risks. The design was then shared with the construction team and others working for tRIIO."

So we know that the roles of principal designer and then designer, they're separate roles under the CDM

regime, aren't they?

A. Yes, they are.

Q. And the role of CDM designer is also distinct from any design role, in the sense of having a contractual obligation to design; is that correct?

A. It is.

Q. For the Grenfell project, tRIIO was both CDM designer as well as having the primary contractual role in designing the works under the contract with Cadent; yes?

A. That's correct.

Q. Looking again at your first statement, now paragraph 22 {MET00012711/4}, you tell us there that:

"As Principal Contractor [this time], tRIIO had responsibility to plan, manage, monitor and coordinate the entire construction phase of the reactive and proactive works."

Is that correct?

A. Yes.

Q. Yes, thank you.

Now, moving on to consider the gas installations at Grenfell Tower itself.

We asked Mr Harrison about the three different gas supplies into the tower yesterday, but I just want to confirm your understanding of those.

If we go to {RHX00000012/14}, this is a figure,

figure 4, from Mr Hancox's expert report, and it shows the three different gas supplies into the tower.

At the bottom, we see in purple the landlord supply, which we understand feeds the boilers. Now, it's right that tRIIO had nothing to do with that gas supply, did it?

A. That's correct.

Q. Yes.

Then we can see in red at the top on the right-hand side, residential supply 1. Now, this was the original gas supply to the flats installed when Grenfell Tower was built; is that correct?

A. Yes.

Q. And we can see, if we follow the red line, that it comes into the basement and then divides into four, four risers, one for each of the four corners of the building. Do you see that?

A. I do.

Q. Again, was that your understanding at the time?

A. Yes.

Q. Yes.

As it goes up, two of those risers split into two, so there are in fact six pipes going up, one into each of the six flats on each floor; is that correct?

A. That is correct.

Q. Thank you.
If we go to page 26 within this report {RHX00000012/26} and look at figure 18, this is a typical floor plan at Grenfell Tower between levels 4 and 23 of the tower. We can see in blue where the original gas riser cupboards were for this supply, for residential supply 1. Do you see those?
A. I do, yes.
Q. Yes, so we can see the gas riser cupboards.
A. Yeah.
Q. Is it right that that would be where the meter was and the pipes would come from there to the gas appliances, ie the cookers?
A. Yeah, so the riser would go up through the riser utility shaft into the flats, into the riser cupboard where the meter -- yes.
Q. Yes, thank you.
Again, did tRIIO have anything to do with the work on residential supply 1?
A. No.
Q. If we go back to page 14 {RHX00000012/14} and look at figure 4 of Mr Hancox's report, then we see, in the middle of the page on the right-hand side, with the green label and the green line, something called residential gas supply 2. Now, that was the new gas

supply riser that tRIIO installed in 2016 and 2017; is that correct?
A. It is.
Q. If we follow the green line, we can see that it also comes into the basement and then comes to the southeast corner of the building; is that correct?
A. That's correct.
Q. From there, is it right that it rises up through the building, through the stairwell, and then through into the lobbies and into the flats?
A. Yes.
Q. Yes. Now, we'll come to more detail about that shortly.
In terms of the background to this riser, we heard from Mr Harrison yesterday that, as part of their rolling inspection programme, Cadent surveyed Grenfell Tower and the surveyor identified that there was a leak between flats 22 and 32, and a Cadent team cut the entire riser that served all of the flats ending in 2 to the tower, so that the entire southeast corner was cut off from gas.
Again, was that your understanding at the time tRIIO worked on the project?
A. Yes.
Q. Did tRIIO have any involvement with that action, that cutting and capping?

A. None at all.
Q. No. And that was done by an emergency Cadent team, wasn't it?
A. Yes.
Q. Yes.
A. Yeah.
Q. Now, you mentioned earlier that you would get a request pro forma. I want to look at that now in the context of discussing what information was provided to tRIIO about this project.
If we can go to {CAD00000019}, this is an email from someone called Danny Large. We can see at the bottom of the page that he worked for National Grid, then became Cadent. The email is dated 3 October 2016. If we look at the email addresses, we can see it's sent to a number of people, including tRIIO personnel.
There is an attachment. He says, "Please see disconnected MOB". We'll go to that in a moment.
In the red text of the email, he says:
"TRIIO have met with [National Grid] onsite to confirm project scope."
Do you see that?
A. I do.
Q. Now, do we understand correctly from this that by 3 October 2016, the time this email was sent, tRIIO had

already been to Grenfell Tower and met Cadent to discuss the scope of the works that tRIIO was to perform following the cutting off of the gas supply to some of the flats?
A. Yes.
Q. Yes. Just to be absolutely clear, were you any part of that meeting?
A. No.
Q. Would tRIIO designers have attended that meeting?
A. I'm not sure.
Q. Right.
A. I'm not sure.
Q. Yes.
Now, you tell us in your first statement that tRIIO was instructed to carry out reinstatement works to the flats affected, and that tRIIO was not required to provide a detailed quote prior to starting the work because of their urgency. You say that in your first statement at paragraph 14 {MET00012711/3}.
Was the usual process that tRIIO would set out a detailed quotation for Cadent to consider?
A. We had a schedule of rates that were agreed as part of the contractual framework agreement, so in terms of the reactive works, which this clearly was one of those projects, gas had been cut off, so we received the

client brief and mobilised to site so the process can start off, and then the costing of the project and the design of the project would follow on. That would then be submitted to Cadent at a later date for approval.
Q. Yes, I see. But I think what I'm getting at is: normally, would Cadent(sic) set out in a detailed quotation the work that it was proposing to do before it started work?
A. Not on the reactive works, no.
Q. No, I see. So for reactive works, you'd often ——
A. Yes, it's different to the planned proactive works. Reactive works, the costing follows.
Q. Yes, I see. So for the reactive works, you just need to get going with the work ——
A. You do.
Q. —— and then any quotation would follow up later?
A. Yes.
Q. Thank you.
Just to be absolutely clear, what did tRIIO understand to be the particular urgency in this case?
A. Gas customers or customers being without their gas supply, wintertime coming, the welfare of the customers was clearly a priority, and therefore hence the urgency to get the gas —— the design and construction process commenced ——

Q. Yes.
A. —— to reinstate the gas supplies.
Q. Yes, thank you.
I want to look now at this spreadsheet that we can see being sent in this email.
If we can go to {TRI000001768}, and I think we need to see the pdf, the native version of this.
So this is the "tRIIO [multi—occupancy buildings] Pre—design Hazard Information", do you see that at the top?
A. Yes.
Q. Then if we go to the second page {TRI000001768/2}, what we can see there is at the very top it's called a "Riser Request Proforma"; is that a document you're familiar with?
A. It is, yes.
Q. Underneath that title, there's a green box. We're just zooming in as much as we can, but I'll read it out to you as well.
In that very top green box it says:
"This document is classed as the Client Brief and supports the ongoing compliance to The Construction (Design & Management) Regulations 2015. The information contained in this document has been prepared to the best knowledge of the Client and in accordance with

Regulation 4(4)."
Below that, we can see the date that this part of the form was completed; it was 1 October, we've got that there in the yellow box, and the time of cut—off was 2 am in the morning.
Midway down the page, we can see on the left—hand side there's a heading "Supply Material". We can see some details of the service pipes that were affected, said to be steel pipes, diameter of 4 inches, the riser material is steel, it's an internal riser location, et cetera. So we can see that there.
Beneath that, we see some details about the building. It says:
"Height of Building: [in excess of] 40 [metres].
"Category of job: High Rise.
"Number of Floors: 23.
"Number of Properties affected: 38."
Then beneath that, we see the flat numbers of the customers that were believed at that time to be affected. I think Mr Harrison accepted yesterday that some of this may be inaccurate because some of these flats seem to end in a 1, not a 2, and it was only those ending in 2 that had had their gas cut off. Is that right?
A. That's right, yeah.

Q. In that table we can see in the fourth column along from the left that there's something called "Vulnerability Identified", and there's some information in there about vulnerabilities for some of the gas users, so for example you can see someone is said to have young children a few lines down, and in the seventh column, in the far right column, there's also information about what appliances these residents used. Do you see that there?
A. Yes, I do, yeah.
Q. Yes.
Would this information be used and referred to throughout tRIIO's works?
A. Yes, this is the document that's issued, as I mentioned earlier on, which is the client brief, and then this would be added to as the design and pre—construction process matures through the programming of the works.
Q. Yes, I see.
Just to confirm, was this all that tRIIO received by way of written instruction from Cadent on the work that you were to perform?
A. Yes, this is the initial document that's sent through.
Q. Would you have expected more than this as an instruction to carry out such work?
A. This was the agreed document, so this is what we would

have expected to receive, yes.
Q. Right, okay.
Going back to the first page of this document {TRI000001768/1}.
As we saw earlier, this is entitled, "tRIIO MOBs [multi−occupancy buildings] Pre−design Hazard Information", and if we go to the bottom of this page, we can see it's dated 3 October 2016.
Now, is it right that this was a document that tRIIO operatives would routinely fill out in order to brief tRIIO for works to be done on gas risers?
A. Can I just ask to go back to the top of the document, please?
Q. Yes, of course.
A. Yes.
Q. Yes, thank you.
In the middle of the page, in the first yellow box, there is a box for "ESRI Vulnerable customer info", and it's noted that a vulnerable customer is present with young children. We can see that there.
If we go to page 5 of this same document clip {TRI000001768/5}, we can see that some data has been gathered about crime statistics:
"Based on data released by local police, the area around Lancaster West Estate has a crime rate which is

much lower than the regional average ... this is a safe place in which to live ..."
Et cetera, so there's some data on crime statistics.
Is that something that Cadent provided to you or that tRIIO would go and routinely gather?
A. We would gather this information. We would run this report to understand the environment, the location we were working in, the hazard that the crime could potentially present.
Q. Yes, I see.
Then on page 7 of this same clip {TRI000001768/7}, there is a map of the gas supply to Grenfell Tower. We have that there.
We saw that the riser request pro forma was stated to be in accordance with the CDM Regulations, and that refers to one of Cadent's duties as client under the CDM Regulations, which is the duty to provide pre−construction information. You're familiar with that; yes?
A. Yes, yeah.
Q. One of the experts to the Inquiry, Dr Lane, has expressed the view that this riser request pro forma was not, on its own, sufficient to meet the requirement of pre−construction information. Would you agree with that?

A. It was the initial document that was sent through, yes.
Q. I understand it was the initial document sent through, but in terms of what you would be looking for as pre−construction information from the client, was that document alone sufficient, in your view, or would that need to be supplemented with −−
A. It would need to be supplemented.
Q. Yes, thank you.
If we can go to your first witness statement again, the Met statement, and look at page 8 of that {MET00012711/8}, paragraph 30, you say this:
"Cadent provided some information to tRIIO about the Tower such as the height of the Tower, number of floors, number of properties and gas usage within the Tower. tRIIO added to that information during the pre−construction stage of works, during which the surveyor gathered information from site by knocking on doors at the Tower. The Tower was owned by Kensington & Chelsea Borough Council and managed by [the TMO] ..."
Was it typical for tRIIO to supplement the information given to it by Cadent by conducting further work on the ground, as you've described here?
A. Yes.
Q. Can you help us, what sort of information would tRIIO be seeking by knocking on doors, as you've explained there?

A. Location of the existing infrastructure, gas infrastructure within the building. Potential locations for the new meter location.
Q. Yes.
A. Appliances. Whether or not there were any additional −− there was any additional information around vulnerable customers. The general layout of the property and, in the surveyor's experience, what might be of use in the design and construction of the replacement riser. Yeah.
Q. Yes.
Was getting access to the flats a challenge at Grenfell Tower, do you know?
A. Yes. Like all MOBs, getting access to properties is not an easy task. It needs to be worked at on a continual basis. It's not just a one knock and get access; it is a continual process that you need to follow.
Q. Yes. Presumably that might be because people just simply aren't in when your engineers are going round; yes?
A. That's correct, yes.
Q. Or would sometimes people not be happy to let gas engineers into the flat?
A. That could very well be the case, yes.
Q. Does that mean that there might not be good or even complete data available to tRIIO when it was designing

the riser?
A. The information was added to during the lifecycle of the project, so the information that was available at the time would have informed the design, and the design wouldn't progress unless it had the appropriate information to enable it to move on to the next stage.
Q. Yes. So, just to be clear, at Grenfell Tower you weren't ever told that the design couldn't progress because you didn't have sufficient information about the riser?
A. That's right.
Q. Yes.
Now, in practice, how would the information you gathered about the riser at the tower, about, for example, people's vulnerabilities, about locations of meters, et cetera, all that information you're gathering, how would that be shared with the tRIIO team?
A. So the information in terms of —— if I just talk you through the design. So in terms of being able to design the riser, we would need to know where the meter location was going to be going in the new property, so the information provided by the surveyor would be used to inform the design team, where the new riser pipeline would need to run, both vertically up the building and horizontally on each floor, so it knew where to install

the access into the property.
Q. Yes. But in practice, on the ground, how would you actually be sharing that information amongst the surveyor, the design team, all the operatives that were on site?
A. Yes, so when the client brief is issued to us in tRIIO, we then commence the creation of what we call the health and safety file, and that's in our —— or it would have been in our electronic system. We had a database, a repository, called Nexus, whereby we would start to collect information.
We were issued with an engineering bulletin from the client with regards to what the content of the health and safety should include, and the hierarchy of folders within the electronic system would represent the requirements of the health and safety file required by the client, and also what information we would need to use to inform the design and the construction.
So it was an iterative process ——
Q. Yes.
A. —— in terms of building that information, and the full team would have had access to Nexus, it was on the web.
Q. Yes.
A. So that's how the information would have been shared, and by electronic forms, emails, and teleconferences,

et cetera.
Q. Yes. Just to be clear, that health and safety file, is that the same as a health and safety file for CDM purposes?
A. It is, it is the CDM health and safety file, yes.
Q. Yes. And would it be shared —— we'll come on in a moment, just a moment actually, to look at all the different contractors and subcontractors beyond tRIIO, underneath tRIIO, who were assisting with this work. Would they also have access to the health and safety file?
A. Not necessarily, no. They would get that information through an operational handover.
Q. Right.
Looking back, do you think they perhaps ought to have had access to the information in the health and safety file?
A. That would have —— yes, would have improved the process.
Q. Yes, thank you.
So in your first witness statement, you have helpfully set out a list of contractors and subcontractors who worked on the riser replacement at Grenfell Tower. I just want to run through a few of them.
If we go to your first statement, your Met

statement, at page 5 {MET00012711/5}, there is a table at the bottom of paragraph 25 of your statement where you say:
"Set out below is a table of those organisations and individuals to which and to whom work was sub—contracted as part of the project."
We can see in the top row we've got K&S, and it says that they were a subcontractor to tRIIO. Now, under "Role" it just says "Senior Partner", and we can see the key contact was Kenny Snell.
Can you help us, what was K&S subcontracted to do at Grenfell Tower?
A. K&S were subcontracted to fabricate and install the new riser and lateral system.
Q. Yes. So they're working on the pipe itself; is that correct?
A. They are, yes.
Q. The fabrication of the pipe?
A. The installation and the commissioning of the pipe.
Q. Yes, thank you.
Were K&S well known to tRIIO?
A. They were, yes.
Q. Yes.
The next row down, second from the top, we can see London Operations Gas, and they are said to be

a subcontractor to K&S; yes?
A. Yes.
Q. And they were there as a surveyor; is that correct?
A. Yeah, so ——
Q. As a sole trader, and that was someone called Simon Boygle?
A. Yes.
Q. Is that correct?
A. That's correct.
Q. Yes, sorry, you were about to say something about ——
A. No, I was jumping ahead there, sorry.
Q. No, no, it's fine.
What was Mr Boygle subcontracted by K&S to do?
A. Simon was subcontracted —— he was the surveyor, so Simon visited the property and he produced the survey, which was then provided to the design team to enable the design to proceed.
Q. Yes.
Although Mr Boygle was a subcontractor to K&S, did tRIIO have direct dealings with him on this project?
A. Not contractually. That was dealt with through K&S. But on a day—to—day basis, he would have been in constant dialogue with the design and pre—construction team.
Q. Right, thank you.

Then, third row down, we can see Holland Gas Engineers Limited, again said to be a subcontractor to K&S. Under their role, it just says "Director", and it's Nathan Littlebury.
Can you help us, what were Holland Gas Engineers contracted to do?
A. Holland Gas provided the Gas Safe engineers. They were contracted to relocate the meter, run the copper outlet pipework from the meter and reconnect back in to the customer's appliances so that gas could be reinstated.
Q. So all of their work would be inside people's flats ——
A. It would be, yes.
Q. —— is that correct?
A. Yes.
Q. Yes. Again, even though they were a subcontractor of K&S, did tRIIO have direct day—to—day dealings with them on the project?
A. Not as —— there would have been contact and dialogue, but not in the same way as there would have been with the surveyor. He was part of that integrated and pre—construction activity.
Q. Yes, I see.
Then the fourth row down, we can see Express Building Contractors Limited, subcontracted to tRIIO, role: director, and Alan Monahan was the key contact.

What were they contracted to do?
A. Express Builders, we used those for the boxing—in of the riser and lateral system and any work that was required inside the flats in terms of moving boxing to enable the meters to be moved or the copper pipework to be run.
Q. Yes, thank you. So that was mainly ——
A. So that would be carpentry work, yes.
Q. Sorry, you said to be moved or the copper pipework to be run ...?
A. Yeah, so, sorry, just to clarify, Express Builders —— so if Holland Gas required any internal modification inside the flat which involved carpentry work, Express Builders would have done that on their behalf, but they were contracted direct us to do that work.
Q. Yes, I understand. So, effectively, they're mainly providing carpentry services?
A. That's correct, yes.
Q. Great.
Then finally, at the fifth row —— this is all I want to ask you here —— we've got Cape Electrical, subcontracted to tRIIO, managing director, Phil Cassateri. What were they contracted to do?
A. Where some of the lighting —— where the lateral pipework, for example, was run around the lobbies, to lay that pipe electrical lights needed to be moved to

enable the route of the pipe to be installed.
Q. Yes. Did they ever move any of the light wells in the stairs, do you remember, as well?
A. I don't remember.
Q. Right.
A. There may have been a temporary requirement, but I'm not 100% sure on that.
Q. You tell us in your witness statement that these contractors were on your approved contractors register. Can you just help us, what is that register?
A. Yeah, before we engage the services of any contractor, they need to fulfil certain criteria. That is known as a pre—qualification questionnaire. That is filled in and that's then reviewed and it satisfies that they are a company that we want to engage with, both from a financial viability perspective, but also from a health and safety capability.
Q. Yes. What checks would be carried out to satisfy tRIIO that, from a health and safety capability perspective, this was an appropriate subcontractor to be dealing with?
A. So, for example, if they would have had a health and safety management system which laid out the arrangements that that company would undertake to satisfy their legal obligations from a health and safety perspective.

Q. Yes. So tRIIO would require to see details of that health and safety management system, would they?
A. Yes, that pre-qualification questionnaire would be reviewed by both our commercial team and our health and safety team.
Q. Yes.
A. And that would get signed off as being suitable or not.
Q. Yes, thank you.
Did tRIIO expressly approve K&S's subcontractors? So where there's a chain below K&S, would tRIIO expressly approve those?
A. I'm not sure, to be honest with you. I'm -- there was a requirement for all contractors and subcontractors under the contract with Cadent to be approved, but I'm -- on that basis, you know, we put these individuals to work, they were inducted into tRIIO and therefore that would suggest that they were -- they would have gone through that process, but I can't explicitly 100% give you that --
Q. I understand.
I think if we look over the page in this witness statement at paragraph 27 {MET00012711/6}, you start that paragraph by saying:
"With tRIIO's approval, K&S subcontracted parts of its work to specialist contractors ..."

So is it right your understanding is they would have had some approval by tRIIO before doing that?
A. Yes, and again, just to clarify, that would have been a contractual requirement with Cadent that we did that.
Q. Yes.
Were K&S's subcontractors, for example London Operations Gas and Holland Gas, on tRIIO's own approved contractors register?
A. Yes.
Q. Yes.
Did Cadent have any role in approving tRIIO's contractors or was this entirely a matter for tRIIO?
A. It was a matter for tRIIO.
Q. Yes.
A. That information would have been shared with Cadent in terms of who was on that (inaudible) if they requested it.
Q. Just to be clear, were these contractors and subcontractors beneath tRIIO obliged to meet the standards and guidance that we talked about earlier, including IGEM/G/5 and Approved Document B?
A. I'm not -- so depending upon which contractor. So Holland Gas, being a gas engineering company, would have had a requirement to satisfy the requirement of Gas Safe registration. Simon Boygle, being a surveyor, he would

have been knowledgeable of G/5, so in terms of discharging his duties, he would have had knowledge of G/5 as well, yes.
Q. I understand. But I think what you were hinting at is that perhaps some of the subcontractors you might not expect to be as familiar --
A. Yeah, Cape --
Q. -- because, for example, they're doing carpentry work or something like that?
A. Express Builders, Cape Electrical, non-gas-related activity wouldn't need to --
Q. Yes, I understand.
A. -- know the industry specs.
Q. In terms of those contractors who needed to be aware of certain standards, including the IGEM standards, how in practice did tRIIO make sure that those contractors and their work met those standards?
A. There was an in-depth inspection and audit regime undertaken by both the contractors, our own internal inspection and audit regime, plus an audit regime undertaken by the client. So there was three tiers of audits that were undertaken on all works that was delivered on the tRIIO contracts, and specifically the Grenfell Tower project.
Q. Yes. At what stage were those three tiers of audits

carried out?
A. That was an ongoing process. So as soon as work commenced, there would have been inspections undertaken. It would have been recorded on, for example, our mobile platform system, and that information would have then been made available to the management team in the form of management information and action taken if non-conformances were identified.
Q. Yes.
Now, turning more specifically to the work that tRIIO did at Grenfell Tower, is it right that tRIIO's work was intended to be in two phases: first, to reinstate the gas service to the riser that was cut off after the gas leak, that's the flat 2 work; yes?
A. Yes.
Q. And, second, to use that design, that new riser, to eventually supply all the flats through that new riser; is that right?
A. Yes.
Q. Yes.
Is it right that you would call the first of that work, the first replacement riser to the flat 2s, reactive works? Is that right?
A. Yes.
Q. And that's reactive to a cut in supply; yes?

A. Yes.
Q. And the next stage of work, ie connecting all the remaining flats to that new riser, you call that proactive works; is that correct?
A. Yes, it is.
Q. And that means proactively replacing the gas supply; is that correct?
A. Yeah, it's a planned operation.
Q. Yes.
Just to be clear, was tRIIO instructed from the outset to replace the entire supply of gas to all the flats?
A. Yes.
Q. So it follows, does it, that Cadent assumed at the very outset that residential supply 1 would in due course be decommissioned and replaced with whatever solution was designed and agreed by tRIIO?
A. That's correct, yes.
Q. Now, if we look at your first witness statement again, if we could go to page 3 of this {MET00012711/3} and look at paragraph 17, you tell us there:
"A survey and pre-construction activities were also carried out for the proposed proactive replacement of the remaining five risers, but construction work had not started on the other five risers at the time of the

fire. As one of the six risers had leaked, it was standard practice for Cadent to take the opportunity to replace the other five risers in the building."
Was it standard practice because there had been a leak in this old gas pipe riser? Is that why it was standard practice to replace the others, because in one of the risers you've had a leak?
A. I'm not -- clearly I can't answer for Cadent's processes and policies. I think it's taking the opportunity -- if we're installing a new riser, then we would leave the opportunity to replace the existing risers, and on that assumption, due to the age of the existing risers, it would make sense to replace those. Whether that's directly related to the condition of the riser that cut off, I think that would be a question for Cadent.
Q. Right. So you can't help as to whether there might have been any other factors that lead to that decision to decide ultimately to ensure all the flats were supplied by the new riser?
A. It's an ageing pipe, and therefore we've replaced one, and hence we would leave the ability to replace the others due to the age of the existing risers. That would be my --
Q. Yes.
A. -- points on that.

Q. To be clear, did tRIIO have any part in the decision as to what to do about residential supply 1, or was it just understood that the whole gas supply would eventually be replaced?
A. No, we had no involvement in that decision.
Q. Yes.
Now, we know that eventually it was decided to put the new gas riser up through the stairs -- certainly the main part goes through the stairs, we will discuss separately what happens at lower level -- and I want to understand exactly how that decision came about, to put the riser through the stairs at Grenfell Tower.
We understand from your statements that tRIIO instructed Simon Boygle to conduct a survey, and he was assisted by two other people at tRIIO, is this right, by Harvey Smith and Martyn Wisken?
A. Yes.
Q. Can you help, who was Harvey Smith?
A. Harvey Smith was the project manager, our operational project manager, so Harvey would have been responsible for the delivery of the installation, and Martyn Wisken was our design engineer, and Martyn was responsible for the design of the new riser system.
Q. Yes.
Was anybody else involved in considering the route

that the new riser would take, for example K&S, were they involved at all?
A. It would have been an integrated review, so that process of finding a solution would have been an integrated decision -- an integrated process, so there would have been input. We would have taken the advice or necessary input from our experts, who would have been involved in whether or not a design was a feasible, constructable solution. So it would have been an interactive process.
Q. Yes, I follow.
To what extent did Cadent have any role in assisting with the decision about where the new riser was to go?
A. Can you just clarify when you say --
Q. Yes, I'm talking about the stairs, putting the riser in the stairs. To what extent did Cadent play any role in that decision?
A. The design would have been tRIIO's design, so we would have ended up using the requirements -- there's a hierarchy in G/5, and we're looking for the least disruptive, least hazardous route. So Martyn and his design team would have, with input from Simon Boygle, come up with a solution. That solution would have been clearly shared with the client throughout that process.
Q. I see, yes.
What about the TMO, the Tenant Management

Organisation, who were managing the building? Do you recall whether they had any input into the decision ultimately to put the riser in the stairs?
A. Yeah, we were restricted —— there were other options, but they were discounted due to being not available to us. So, for example, putting the riser on the external façade of the building, which would have been clearly our preference, that was rejected by the TMO on the basis of the cladding, and that was —— so that was rejected, yeah.
Q. Yes, thank you.
In a moment I'm going to take you through each of the options that were considered and the reasons why they were discounted. I guess at this stage I'm just trying to understand who would have had an involvement in that decision, and you say the TMO did have some involvement?
A. Yes, it was a tripartite, in effect, involvement with Cadent, the TMO and ourselves.
Q. Yes.
Now, some of the TMO witnesses have been asked questions about this, and I just want to look at something that Mr Maddison, Peter Maddison, said. He was the director of assets and regeneration at the TMO.
If we could go to the transcript, please, now, at

{Day124/160}.
He's being asked at this point about a number of complaints that had been raised about the riser going through the stairs, and at the top we get the question:
"Question: So does that tell us that in fact, although you say you were keeping the complaint open, you were only keeping it partly open? In other words, you had already decided to keep the pipes in the stairwell but make sure that they were boxed in properly?
"Answer: If it was my decision I wouldn't have had the pipes there, I would have had the gas removed from the building altogether. So it wasn't my choice. This was something that National Grid imposed and they were inflexible around this, said this was the only place it could go, and we had no choice, really, in this matter."
I just wanted to get your response to that.
Do you recall there being discussions with the TMO specifically about placing the riser in the stairs?
A. There were —— I do recall discussions around the riser going in the stairwell, and that was —— would have been relating to the boxing—in of the system.
Q. Yes.
A. I don't recognise that, that statement there. That wasn't something that I would have been made aware of.

Q. Right, yes. So from your perspective, in terms of what you were aware of, were Cadent or tRIIO acting for Cadent inflexible about the route that the riser could take?
A. It was the only route available to us if we was to reinstate gas back to those properties.
Q. And was that communicated clearly to the TMO, that it was the only route available?
A. It was, after the other options had been discounted by the parties, yes.
SIR MARTIN MOORE—BICK: So are we to understand, then, that your designers did at least investigate the possibility or consider the possibility of putting the riser somewhere else, and that that was raised with either the TMO or the council or both of them, and the message came back: you can't put it, in this case, outside the building?
A. Yes. There were four options available to us, one of which was the option that got designed. There were three other options, one of which was discounted; it wasn't practical or there wasn't an engineering solution to it. The other two were disregarded by others, namely the TMO and Cadent.
SIR MARTIN MOORE—BICK: What were those two options? I know one of them was to put it up the outside of the

building.
A. The other option was to buy the gas out, so not put gas back into the building.
SIR MARTIN MOORE—BICK: So it was really three possibilities: buy the gas out ——
A. Yes.
SIR MARTIN MOORE—BICK: —— put the riser on the external façade or put it up the stairs?
A. That's correct, yeah.
SIR MARTIN MOORE—BICK: And those were all raised, but two of them were discounted, either by the TMO, in the case of the external riser, or Cadent, you say, in the case of buying out?
A. Yes, that's correct.
SIR MARTIN MOORE—BICK: Thank you.
MS GRANGE: Yes.
Now, just going through those options in a little bit more detail, so option 1, the outside of the building, is it right —— and I think you've just confirmed —— that there is a preference for routing gas risers outside a building where possible?
A. That's correct.
Q. Does that come from technical standard IGEM/G/5, which says that running the risers and all the laterals externally and then bringing them in to meter points

immediately on entry into the building is the most preferred gas pipe design?
A. It is, yes.
Q. Just in practice, what happens with that? Do you encase the gas riser in its own external shaft outside the building? How does that work?
A. No, the shaft -- the boxing-in is required, so -- for ventilation purposes, and clearly if the pipe is running external to the building, it's naturally ventilated.
Q. Yes.
A. So there is no requirement to box that in --
Q. I see.
A. -- as you described.
Q. Yes.
A. It's left vent -- should a leak occur --
Q. So you just see a naked pipe --
A. You just see a naked pipe, yes.
Q. -- going up the outside of the building --
A. Yes.
Q. -- and then penetrating each of the flats, where it would then meet a meter inside those flats; is that how it would --
A. That's correct.
MS GRANGE: That's how it would work.
SIR MARTIN MOORE-BICK: Sorry to interrupt again, but maybe

I don't understand exactly how this would work, but do the planners not have any view about the appearance of an external pipe of some kind or another, un-boxed-in, unprotected?
A. Yes, it can be a challenge. The aesthetic impact, if that's the way to describe it, of a pipe going on the outside of a building is not always welcome.
SIR MARTIN MOORE-BICK: What sort of pipe would it be?
A. It would be steel pipe, generally speaking, 2-inch in diameter, depending on the number of customers that it would need to supply. It would be a steel pipe painted black.
SIR MARTIN MOORE-BICK: Yes, thank you.
MS GRANGE: Yes. And can you help us, how serious was the consideration given at Grenfell Tower to that option?
A. It was a -- it was our preferred option.
Q. Yes.
A. So it was the preferred option, it would have been the number 1 option available to us. When that was discounted or we were told that we couldn't do that, then we looked at the buy-out option, that wasn't possible, and then we were left with finding a viable route, and that was the route that was available to us, the only route that was available to us, after those two other options had been discounted.

Q. Yes. I think you tell us in your witness statement that the reason it was discounted is because it would penetrate the new cladding and would have rendered the cladding guarantee null and void; is that correct?
A. It is, yeah, that's my understanding, yes.
Q. And also for aesthetic reasons, they didn't want the new cladding being penetrated by gas pipes; is that correct?
A. Yes.
Q. And that was something the TMO communicated to you; is that correct?
A. It was, yeah. Not me personally, but to the designers, yes.
Q. To the team, yes. So there were discussions with the TMO, were there, over this option?
A. Yes.
Q. Right. Were those verbal discussions? Because we haven't been able to find any documents that detail these discussions.
A. I don't know. I can't -- I'm not 100% sure.
Q. Would it be fair to say that it was decided quite quickly that the riser would have to be reinstated, if it was going to be reinstated, through the interior of the building?
A. Yes, after we had discounted those two options, to be able to comply with the requirements of G/5, that was

the route that was taken.
MS GRANGE: Yes.
Mr Chairman, I was just going to quickly run through a couple of other options, but equally I can stop there, because they're slightly discrete little topics.
SIR MARTIN MOORE-BICK: What would you prefer to do?
MS GRANGE: Let's stop now. I'm making good progress and I'll carry on with the other options when we pick up after the break.
SIR MARTIN MOORE-BICK: Right. Thank you.
Well, Mr Dolan, as I think we warned you, we have a break during each session. This seems to be a good time to take a break now. So we'll stop and resume at 11.30.
I have to ask you, please, not to talk to anyone about your evidence or anything relating to it during the break. All right?
THE WITNESS: Yes.
SIR MARTIN MOORE-BICK: Thank you very much. Would you like to go with the usher, please.
(Pause)
Thank you. 11.30, then.
MS GRANGE: Thank you.
SIR MARTIN MOORE-BICK: Thank you.
(11.15 am)

(A short break)
(11.30 am)
SIR MARTIN MOORE-BICK: All right, Mr Dolan, ready to carry on?
THE WITNESS: Yes.
SIR MARTIN MOORE-BICK: Thank you very much.
Yes, Ms Grange.
MS GRANGE: Yes, thank you.
Yes, we were in the middle of discussing the different options for the replacement riser and how it came about that that riser ended up in the stairs, and we've already just discussed the fact that there was a proposal to put it on the outside of the building, but you explained that that was not satisfactory for the TMO and so you had to look inside the building for the riser; is that correct?
A. That's correct, yes.
Q. Yes.
I now want to discuss the option of running it through residential supply 1, so running it through the existing position of the riser that had been cut off.
Now, as we understand it -- is this right? -- the existing gas supply ran from the basement, up through the building and into the flats at the kitchens, so it was actually going internal to the flats --

A. Yes, my --
Q. -- as it penetrated the building.
A. Yes, my understanding, in through the basement, up into a riser cupboard and then into a flat, and then it would have progressed through the building, through the flats, to the very top.
Q. Yes.
If we look at your first statement again, your Met statement, page 8 {MET00012711/8}, paragraph 31, you tell us there:
"The existing network could not be repaired due to the leakage being within the fabric of the building i.e. embedded in the concrete between flats. If we could have visually inspected the gas riser, it may have been possible to refurbish the existing pipe."
So was any consideration actually given to the possibility of simply repairing the cut riser?
A. So there is a process that, subject to being able to inspect the pipe in its entirety, and then possibly to put a -- what you call a test on it, it would have been then possible to reconnect it. But because we couldn't visibly inspect the pipe, there was no option to use that -- that option was not available to us.
Q. Yes.
Is it right that you couldn't visibly inspect it

really for two reasons: (1) because it was going up between people's flats, so there was the problem of access; and (2) because it was going between concrete floors --
A. Yes --
Q. -- through concrete floors --
A. Yes, embedded --
Q. -- which made inspection difficult? Is that a fair summary of the problems?
A. It is, yes.
MS GRANGE: It is, thank you.
SIR MARTIN MOORE-BICK: I think you ought just to explain what you were trying to say. It's embedded in the ...?
A. The fabric of the building.
SIR MARTIN MOORE-BICK: In the concrete?
A. It is, yes.
MS GRANGE: Yes, and what is the problem with pipes being embedded in concrete, can you just explain?
A. In the context of being able to reconnect it and use it?
Q. Yes.
A. Not being able to visibly inspect it.
Q. Right, yes.
It's right, isn't it, that there weren't any sleeves around the original pipework, so the pipe was just directly concreted into the floors; is that correct?

A. That is my understanding, yes.
Q. Yes.
The next option I just want to ask you about is running it through the utilities shaft.
We know that there were already some shafts for utilities running vertically through Grenfell Tower for water, for example. In particular, there's a utility shaft in a cupboard by the stairs opposite the lifts. I don't know whether you recall that.
A. Yeah, there are two -- from the basement, there is a utility cupboard or -- you know, utility cupboard on what we would consider the first floor, a second utility cupboard above that, that would then go into the flat above, and then the riser would proceed up through the flats. So whilst we could have got a pipe into the basement and into the first two riser cupboards, you couldn't go up into the flats because you would have had to get in the flat to run the pipeline within the flats, so that was not available to us.
Q. Yes. What about going up through those utilities cupboards and then going into the utilities cupboards that go through the lobbies at Grenfell Tower at levels 4 to 23?
A. So the question was asked through dialogue with the TMO around using the existing ceilings to run the lateral

pipes. That was discounted. Their contractor advised against that in terms of room, and being unventilated.
Q. Right, I see. So I think what you're saying is that, what, the ceilings in those utilities cupboards wouldn't have been appropriate for running your laterals off it?
A. Yes, that was my understanding at the time of the discussions between the design team and the TMO.
Q. Yes, and you're saying there was a potential problem with ventilation in that utilities shaft; is that correct?
A. In the false ceilings, the suspended ceilings. That's my understanding, yes.
Q. Right.
Was this ever a serious option that was looked at at Grenfell Tower, doing it this way?
A. It was looked at, yes. I have seen email traffic between ourselves and the TMO where that option was discussed.
Q. Right.
Now, let's look at the route that was actually chosen.
If we could go to {TRI000000044}, this is an email from Mr Boygle, the surveyor, on 12 October 2016. He is sending this to various tRIIO personnel.
You can see that he says in the main paragraph, so

after "Hello Harvey":
"As discussed, I've identified a route up through the block to the top floor. This pipe would eventually supply the remainder of the block. Security valves can be left. The riser can be installed in the stairwell close to the affected flats. The main issue is the recently installed mechanical air vents circulating the air on all communal landings.
"At this stage, I haven't contacted the council whilst investigations still ongoing."
He says that the council contact is Charlie Saul at the TMO, and we'll see his name in some other exchanges.
Mr Boygle attaches some marked-up photographs to that email, and we can see the route that was proposed, and we'll do that in a moment.
Can you help us, where he says at the end of that first paragraph, "The main issue is the recently installed mechanical air vents circulating the air on all communal landings", can you help us as to what he means by that?
A. Yeah, the issue he's referring to is being available to ventilate. So the gas pipe that would have run in this -- what he's talking about here, running from the stairwell into each communal landing, that communal landing had mechanical ventilation fitted, and there are

two issues with mechanical ventilation: one, there is a source of ignition, which is a problem, obviously, if there's gas escaping from a leak on the pipe; and also should that mechanical ventilation break down, therefore there is no ventilation, and therefore it's not suitable -- mechanical ventilation isn't suitable for providing the ventilation requirements specified by G/5 for gas pipes in that location.
Q. Yes. Yes. Because it's right, isn't it, that ideally -- well, the recommendation is that you have natural ventilation around a gas pipe; is that correct?
A. It is, natural ventilation, indirect and direct ventilation, dependent upon the construction used.
Q. Yes, thank you.
Let's look, then, at the marked-up photographs showing the route that he was proposing. If we can go to {CAD00000054/4}.
Here we can see a marked-up map showing the gas services coming in from the east, which is where the other two services come in from, so he's sending that, and you can see he's marking a new supply on to this map, I think in the yellow arrows.
If we then go to page 9 {CAD00000054/9}, we can see a photograph. This is a photograph of the east side of the tower, at ground level, and what Mr Boygle's done is

marked up the three services coming in, and is it right that the new service was the 4-inch service at the right of this picture? Is that correct? We can see there is a 10-inch service going in to the left.
A. The 4-inch and the 10-inch are the existing supplies.
Q. Ah, I see. Sorry, that's a mistake in our notes.
A. Yeah.
Q. Sorry. So is this just showing you what the existing services are that are going in?
A. Yeah, so --
Q. I see.
A. -- the 10-inch and the 4-inch -- the 10-inch is to the boiler, the landlord supply, and the 4-inch was to the existing six risers.
Q. Yes, thank you.
If we go to page 10 {CAD00000054/10}, we can see -- is this right? -- that with these yellow lines he's showing how the service would come into the basement at around 5 metres high; is that correct?
A. It is, yes.
Q. Yes.
Page 12 {CAD00000054/12} shows us how it would come into the basement and then up through the ceiling of the basement; is that correct?
A. It is, yeah.

Q. Page 13 {CAD00000054/13}. You were talking about service riser cupboards. We can see that he's suggesting that -- this is at ground and first floor level -- it would go through this service cupboard; is that correct?
A. It is, yeah.
Q. Yes.
Then at page 14 {CAD00000054/14}, the next page, we can see how the riser would go through the main entrance lobby at Grenfell; do you have that?
A. I do.
Q. And again, that's the yellow dotted line; yes?
A. Yeah.
Q. At page 15 {CAD00000054/15}, we see floor 2. This is the second floor. So it's coming through the floor of the stairs, having gone through that atrium, and then it's rising into the stairs and starting to travel through the stair shaft; is that correct?
A. Yes. On the previous picture, the riser that we installed --
Q. Yes, let's go back to that {CAD00000054/14}.
A. Yeah.
Q. So if we go back one picture, yes, do you want to explain?
A. That riser, through the two floors before it entered

into the stairwell, as you just seen, they were the riser cupboards. So there was a riser cupboard on -- as it come out of the basement, there is a riser cupboard with a louvred door. Then there was a similar setup above that where it went into, and then it went into a storeroom and then it went into the stairwell.
Q. Yes, I see. So it's not actually going --
A. It doesn't actually go there, no.
Q. -- through the lobby like this, it's going behind where we're seeing --
A. Yeah.
Q. -- through a series of cupboards and other riser cupboards?
A. Yeah, that's correct.
Q. Yes. Thank you for that.
Then if we go to page 16 {CAD00000054/16}, we can see that he's explaining how it would go up through the stairs, and you can see at the top that it would go through the ceilings of the stairs, and he's also starting to show how lateral pipes would branch off to start to serve each floor. Is that correct?
A. It is, yes.
Q. If we look at page 17 now {CAD00000054/17}, this shows the view from the communal lobby at levels 4 to 23, and is it right that the pipe comes in through the left and

then snakes around the top of the wall under the ceiling and then across to the flat? Is that correct?
A. Yes.
Q. Yes, thank you.
Then just a few pictures to show how the riser was actually built, because this also helps to explain the position that it went into.
If we could go to {CAD00001640}.
This is a picture of the riser on floor 4 in the stairs, and it's gone through the floor at the bottom and it goes through the top, and then it's branching off and then going through the wall into the lobby, is that correct, on the other side?
A. Yes, that's correct.
Q. If we could go to another picture, {TRI000001431}.
If we just rotate that picture, now we can see the as-built picture. This is the pipework, so what we haven't got, and we'll come to it later, is the boxing-in at this point, but am I right that this is how the pipe itself was built, coming out of the stairs at the wall to the left, and again passing round the ceiling or just underneath the ceiling and then down and through to the flat 2s? Is that correct?
A. It is.
Q. It wasn't all flat 2s, was it, it was only some of

them --
A. Yeah.
Q. -- who needed gas?
A. 13 of the 20 flats needed gas.
Q. Yes, thank you.
So that was the proposal, and then we know that there was a second survey by Mr Boygle. If we can go to that, this is at {CAD00000038}.
This is an email he sends on 1 November 2016, again to tRIIO and a number of its subcontractors. He says:
"Morning Harvey
"As requested I had another look at the landings to avoid running any pipework within the heating pipe boxing."
He gives a number of measurements that he's carried out.
Then if we go down to where he's got a heading, "Gas meter resites", he says this:
"All flats have an area of between 1m & 4m that back onto the communal landings which can be drilled through for new gas meter positions.
"There are a variety of cupboards to relocate the meter into."
Now, just to be clear, was it necessary to move the gas meters within flats to be closer to where the

pipework entered the flats?
A. Yeah, there are restrictions on the length of pipe that can be run inside a residential property. That length is 2 metres. So to -- if we would have -- to get back to the original meter locations, we would have had to have laid or installed pipe at a greater length to 2 metres, with also -- we'd have introduced fittings. That isn't allowed under the specifications that we work to, so we had to look for a location for the meter to be relocated that was within that 2-metre maximum length.
Q. Yes, thank you. Yes, that's helpful. So they're effectively within 2 metres of the front door?
A. Yes, exactly.
Q. Yes. So they're moved, just to be clear, from the kitchen cupboards to being by the front door; is that correct?
A. There is a room next -- so as you come through the front door, there is a hallway and there is a room next to that hallway, and that's where the meter was relocated.
Q. Yes. I'll take you to some pictures of that in due course, we'll have a look at that.
Now, Simon Boygle attaches some more marked-up photographs to this second survey, and these illustrate how he proposed the proactive works to be installed, ie this was the works later to extend the riser to serve

more flats.
If we just have a look at that, this is within the same document at page 4 {CAD00000038/4}.
Is it right that the pink arrows going to the left here are showing how the riser would be extended in that direction in the stairs? Is that correct?
A. I'm not sure with that photo. That was the extension of the riser in the stairwell to get to a pipe to lay into a separate floor.
Q. Right. You're not entirely --
A. No, my understanding from my recollection was that we would branch off of the pipe in the green --
Q. Yes.
A. -- with the yellow into the stairwell --
Q. Yes.
A. -- into the communal landings and --
Q. So you'd go off to the right --
A. Yeah.
Q. -- and then to all of the landings? I see.
A. But --
Q. So you can't help us with what he's showing in the pink arrows?
A. I can only -- no, I'm not 100% sure. I can make sort of an engineering judgement on it, but --
Q. We think that the pink arrows might be to go to the

flats ending in 1; is that possible?
A. It could be.
Q. That for the flat 1s it goes that way and for all the other flats it goes to the right.
A. That could very well be, yes.
Q. Right, thank you.
If we go to page 8 of this clip {CAD00000038/8}, we can see with the pink arrows he's showing how the riser would be extended within the lobbies to service other flats; is that correct?
A. That is right, yes.
Q. Those are the laterals branching into each of the flats.
A. Yeah.
Q. And then at page 11 {CAD00000038/11}, we can also see something similar being shown. Yes, and there you can see another view of that. Do you see that?
A. Yes.
Q. Now, would the tRIIO designers have received all this information from Mr Boygle following his surveys?
A. Yes, we would have understood the number of flats on each floor, the gas loading requirements of each customer, and they would have used that information to design the size of the pipe required to satisfy that gas requirement.
Q. Yes.

Now, would they have examined this proposed route for themselves? I'm looking to explore the extent to which they would have just taken what Mr Boygle said in his survey, or would they have separately asked themselves the question whether that was a sensible route?
A. They would have asked the question, yes. They would have asked for alternative routes. Whether or not Simon could find an alternative route, I'm not sure. That's the survey information that we received. It enabled the designers to extend the reactive works to the flats that would have been part of the planned proactive works.
Q. Right.
Thinking about both surveys that Mr Boygle did, the first one showing the route of the new riser and the second showing more about the proactive works, was it the responsibility of the tRIIO designers to evaluate the safety and compliance of those routes themselves?
A. It was, yes.
Q. Right. So they couldn't just rely on Mr Boygle's surveying work, they had to ask themselves separately whether it was a safe and compliant route to follow; is that correct?
A. Absolutely, yes.
Q. Now, let's look at the first design, I'm going to call

it replacement design number 1. If we can go to {TRI000000263}.

So this is a drawing, and it's also got some little inserts, including with the map, of the first design that was come up with for this work.

On the left-hand side, in the third box down, we get the date. It's dated 11 November 2016. Sorry, it's very small writing.

A. That's better.

Q. That's better, yes. You can see the user ID, Ashley Johnson. Who was Ashley Johnson?

A. Ashley was a design analyst, or is a design analyst.

Q. Yes, and the date is 11 November 2016.

It says in the bottom third of the page, the bottom text in the left-hand column, it tells us:

"This project has been designed in accordance with IGEM/G/5 & T/PR/ML4."

What was T/PR/ML4?

A. That is Cadent's main laying procedure, so any gas pipe -- it was -- it relates to the in-ground pipe. So the in-ground pipe would have been designed to ML4 requirements and the riser system to G/5.

Q. At the very bottom of this page we can see a web address, a URL, for this document. There we go, right at the bottom. There's reference there to something

called GASWorks9.

Now, you tell us in your first statement that the project was designed using this software; is that correct?

A. Yeah, in terms of design, GASWorks9 would be used to size the riser system. So it would take the length of the pipe required, it would take the gas usage required, and it would use those two component parts to determine the size of the pipe required for that particular building. So in the context of the design, that's what that means.

Q. Yes, I see.

Just to be clear, that's gas modelling software; is that correct?

A. Yeah, it's a hydraulically -- it models using hydraulically -- analysis.

Q. Does it model pressure drop, velocity, gas demand, size of pipe?

A. It does, yes.

Q. Just to be clear, it doesn't assist with considering other technical compliance issues like ventilation or compartmentation breaches, does it?

A. No, it doesn't.

Q. So if we look at the drawing itself, we can see at the bottom there we've got that little red dotted line. Is

that the gas main into the building?

A. Yes, that would be the inlet pipe, the 90-mil.

Q. And a new service pipe had to be built underground for this supply, didn't it?

A. It did.

Q. Yes.

And the red bow-shaped symbol, is that an isolation valve?

A. Yeah, that's a pipeline isolation valve, known as a PIV.

Q. PIV, yes, thank you.

Then the dark green pipe goes through the basement and up, and we can see a little blue symbol then at each floor. Perhaps if we can now pan out of the drawing and see.

Now, that little blue symbol at each floor, does that indicate the valve that was there when the proactive design was going to be put in?

A. It's very difficult to say on this drawing. I just want to clarify, the -- that would be to extend the -- yes, the proactive works.

Q. Right, yes.

Then on each floor, we can see a yellow pipe that's coming out and is going round through the stairs, into the lobby, and round the outside of the lobby. Is that right? That's showing the laterals?

A. Yeah, it is.

Q. Yes. Then the bright green box on each floor, is that where it enters each individual flat?

A. That's -- on this particular drawing, this is entering the flats ending in 2.

Q. Yes, just to be clear, exactly, this is the design for the first phase of your work.

A. Yeah.

Q. We can see the drawing finishes at the top with the laterals on floor 23, and is it right that the intention was the pipes would finish at floor 23 and then take advantage of the natural ventilation provided by the roof vent?

A. Yes, that's right.

Q. Just looking at the little inset drawing in the middle of the page, if we could blow that up, this is headed "Internal lateral pipe work requires boxing in, on each floor as below". So it's showing us the boxing-in plan.

As we understand it, is it right that the dark green pipe on the left, that's the riser coming up through the stairs; yes?

A. Yes, yeah.

Q. The yellow pipes were the laterals that then go through the stair wall and into people's flats; yes?

A. Yes.

Q. And the hard black line around some of those laterals shows the boxing—in.

Now, is it right —— and this is important —— that in this particular design the boxing—in is only on the communal lobby side, where the pipes were to be boxed in completely?

A. Yeah, so as the pipe went through the wall from the stairwell into the communal lobby ——

Q. Yes.

A. —— on that side of the wall in the communal lobby, the extent of the pipe in the lobby would have been boxed in.

Q. Yes. So once it's in the lobby, it's got its own little compartment around it, but when it's in the stairs, according to this first design, the pipe was going to be naked; is that correct?

A. Yes, it would be —— it was segregated from the —— this is for ventilation purposes, because of the mechanical ventilation that I referenced earlier.

Q. Yes.

A. So we segregated this pipe from the lobbies where the mechanical ventilation was and it in effect become part of the stairwell. It was open—ended into the stairwell.

Q. Yes, thank you. So there would be oversized holes, wouldn't there, around the pipe as it goes into the

lobby ——

A. That's right, yes.

Q. —— to allow a free flow of ventilation from the boxing—in back into the stairwell; yes?

A. Yes, correct.

Q. And the stairwell itself would be —— this is the intention —— to provide the natural ventilation to the riser itself; yes?

A. Yeah. So for design 1 there was ventilation at roof level.

Q. Yes.

A. And I think it's important to note that the pipe in the stairwell in design 1 was a welded system.

Q. Yes.

A. So direct ventilation was available at the roof vent, and at the bottom of the stairwell we had indirect ventilation, which was the door movement, air movement, resulting from the door into the stairwell. So we had indirect ventilation at the bottom of the stairwell, and direct ventilation at the top.

Q. Right.

A. And that was the design that was produced in design 1.

Q. Then the red text at the bottom of this inset drawing says:

"Boxing to be open ended into communal stairwell to

allow ventilation of the lateral pipework."

That's what we were just discussing; yes?

A. That is it, yes.

Q. Yes.

Just to visualise the hole around the pipe, through the stair wall and into the lobby, if we can just look at a picture, {CAD00001653}.

This is a photograph of the lateral on the stair side going through the wall into the lobby, and there we can clearly see the oversized hole; is that correct?

A. That is that, yeah.

Q. And it's there for ventilation purposes?

A. It's there to vent, yes, for the laterals, yeah.

Q. Yes. Yes.

So this design did require the compartment between the stair and the lobbies to be breached to ensure that the gas pipes could be ventilated; that's right, isn't it?

A. It is.

Q. Yes.

Now, can we look at the design risk register now that tRIIO completed in relation to this design. That's at {TRI000000369}.

At the top we can see this is called a "CDM Design Risk Register", and in the box underneath that we can

see it's dated 15 November 2016.

Beneath that, there is a box, or two below that. We can see the designer's name, Ashley Johnson, and just below that it says, "Project RAG Status based on Residual Risk Score".

Can you just help us, what does RAG stand for?

A. So it determines —— so very, very simply in terms of RAG is red, amber, green, red being higher risk than amber, amber being higher risk than green.

Q. Yes.

Then we can see below that, highlighted in green, the score for this, under this assessment, is 17; yes? Is that right?

A. Yeah.

Q. And the significance of that can be seen by looking at the key beneath that, because what it says in the key beneath that is if it's less than 18 —— it's very tiny text, I don't know whether we can make it any better. So in the smaller little green rectangle it says if it's less than 18, the wording says:

"Issue to Ops; No [Hazard]/Op Handover Meeting Required."

Then in red it says if it's greater than or equal to 18, "Full DRA required". Is that right?

A. That is right, yes.

Q. What does a full DRA mean?
A. So a DRA stands for a design risk assessment.
Q. Yes.
A. It may help if I explain the process.
Q. Yes, please do.
A. So the design team within tRIIO designed MOBs projects, but it also designed mains replacement projects and various other activities that were required under the contract. Every project went through the design risk register process, and it was those projects that were deemed to have a higher level of risk after going through that process whereby a more detailed design risk assessment would be undertaken.

In this instance, for design 1, the risk was felt at that time it was sufficiently low enough not to require a design risk assessment.
Q. Yes, thank you.

So because the score came to 17 in this instance, there was no need to consider any further risks in this design; is that correct?
A. That's right, yes.
Q. Yes.

If we go to the bottom of the page, we can also see a box right at the bottom that says, "Manual DRA override needed?" Do you see that?

A. Yes.
Q. What does that mean?
A. If —— so the design risk register requires information to be input, and a score is generated from the actual system itself. Now, if the designer at that point —— if that, for example, comes out at 10, but the designer feels that, in this instance, a design risk assessment is required, he can override that and go to the full design risk assessment.
Q. So it's a human being ——
A. Yes, the ——
Q. —— countenancing what's happened with the system?
A. There is a security. Look at it as a security level, in effect.
Q. In this case it looks like the designer did not manually override the process and go on and do a full design risk assessment; is that correct?
A. It is, yes.
Q. Yes.

Let's just have a quick look to see what would have been considered had that DRA process been triggered.
A. Yeah.
Q. If we can go to {TRI00001218}.

This is the design risk assessment which was conducted later, in March 2017. We're going to come to

that in due course and see that there was a second design risk assessment process. But just for the moment I want to see what would have been considered, the questions that would have had to be considered, if this DRA process had been triggered.

If we can go to page 4 of this document {TRI00001218/4}, and towards the bottom of the table —— sorry, again, it's very tiny writing —— if we could blow up items 19, 20 and 21, what we get is in the header in blue, it says "MOBs Specific Hazards". So, as I understand it, these are specific hazards which might arise in multi—occupancy buildings; is that correct?
A. Yes.
Q. Beneath that, we've got three items that are asked to be considered. We can see 19 is "Breach of Fire Compartments"; 20, "Failure Mode — Expansion south facing pipework & thermal expansion", so that's about expansion of pipework; and 21 is "Inadequate ventilation". Do you see those three matters there?
A. Yes.
Q. So it's right that those three items are only considered if there is a design risk assessment process; is that correct?
A. It is, yes.
Q. So unless someone's manually overridden it, or unless

the score is high enough, these questions are not asked at the design risk assessment process; is that correct?
A. Yes, they're not —— they wouldn't have been in this instance.
Q. Yes.

Now, can we agree that replacing the gas supply to Grenfell Tower did involve breaching of fire compartments?
A. It did, yes.
Q. And pretty important fire compartments, weren't they?
A. Yes.
Q. As in the stairs, the single stair; yes?
A. Yes.
Q. And through to the communal lobbies ——
A. Yes.
Q. —— for flats.

It also involved —— can we agree this —— a complex ventilation strategy?
A. Yes.
Q. So can we take it from this that the tRIIO designer did not specifically consider these features in any detail when the initial design was created?
A. He —— they considered the breaches of the fire compartments in terms of boxing—in. The boxing—in was fire rated, but it wasn't part of the design risk

assessment process, it wasn't formally documented under this process, that's correct.
Q. Can you help us as to why not? Given what you have just accepted, that this was breaching important fire compartments, it was a complex ventilation strategy, can you account for why a tRIIO designer didn't manually override so that those specific risks were considered?
A. I can't provide an explanation as to why the designer at that point did not manually override that design risk register.
Q. Looking back on this now, do you agree that those features -- breach of compartmentation, ventilation -- should have been the subject of a detailed design risk assessment?
A. I do, yes.
Q. Yes. But the way that the design assessment process was carried out, the overall score meant that these risks were not considered in any detail; that's right, isn't it?
A. Not part of that process, yes.
Q. Doesn't that indicate that this design risk assessment process was flawed?
A. Yes, it does, it was weak.
Q. Yes, thank you.
Now, you tell us in your first statement at page 10

{MET00012711/10} -- I don't think we need to pull it up -- paragraph 39, that the design was prepared by tRIIO designers and was approved by a tRIIO design engineer.
Can you help us, what was the process for design review and final approval?
A. Yeah. In tRIIO we have something called a design management plan, and it's a document that sets out the arrangements of how we manage design across the various workstreams under this contract, or under that contract. And within that design management plan is a -- the arrangements for reviewing and approving designs before it finds its way into the -- as an approved design. So in Grenfell Tower, the design was produced by, as you can see, Ashley Johnson, and it would have been approved by our design engineer. Design 1 would have been approved by Martyn Wisken, our design engineer.
Q. Right, yes.
Now, I just want to focus now on some other particular design principles and the consideration given by tRIIO and others to these in the design.
So, as we've seen, the design required the riser to go through the stairwell for most of its part.
Can we just look at Approved Document B now, so this is at {CLG00000224/53}.

We can see on the right-hand column there is a paragraph 4.40, and the heading to that is "Gas service pipes in protected stairways". Do you have that?
A. Yes, I do, yes.
Q. We can see what it says. It says:
"Gas service and installation pipes or associated meters should not be incorporated within a protected stairway unless the gas installation is in accordance with the requirements for installation and connection set out in the Pipelines Safety Regulations 1996 ... and the Gas Safety (Installation and Use) Regulations 1998 ..."
So, in other words, is it right that this appears to say that you can build a gas riser in a protected stair, but it has to meet other technical requirements of a gas riser in those other regulations?
A. That's what that says, yes.
Q. Were you aware of this provision within Approved Document B at the time?
A. I wasn't personally.
Q. No. Would you expect your -- I mean, you have mentioned before that you wouldn't have expected your designers to have been particularly familiar with Approved Document B.

A. No, they wouldn't have been. They would have been using IGEM/G/5 as the main document in producing that design, on the understanding that, by complying with G/5, these other regulations that relate to the work would have been satisfied.
Q. Yes. So does it follow that you wouldn't have expected the tRIIO designers to have been aware of this particular part of Approved Document B?
A. That's correct, yes.
Q. Yes.
Would you expect a tRIIO designer to know the difference between a protected stair and a firefighting stair?
A. Not necessarily.
Q. As far as you are aware, was there any further consideration about whether putting the riser in the stair was acceptable? For example, did tRIIO consider asking the TMO to check with the London Fire Brigade if that was acceptable?
A. We didn't specifically ask that it's checked with the London Fire Brigade, but the design was sent through to the TMO and the TMO approved that design.
Q. Right.
A. They approved the commencement of the project, and there was dialogue, email traffic, between our design team and

the TMO with regards to the design and whether or not it would be acceptable from the TMO's perspective.
Q. Right. But you didn't specifically flag that you would suggest that the London Fire Brigade should be consulted over this?
A. Not the London Fire Brigade, but there was email dialogue or traffic around checking or confirming the fire requirements of the building.
Q. Right.
What about flagging that it ought to be checked with the fire risk assessor that was being used by the TMO, to check that they were content with it being in that location?
A. I can't recall personally whether or not that question was asked, in terms of specifically with their fire risk assessor, although I do know that the fire risk assessor reviewed the works and the design.
Q. Yes.
Can we look at another part of Approved Document B now, at page 116 {CLG00000224/116}.
This is diagram 52, that sets out various components of a firefighting shaft. This is in the B5 section of Approved Document B which, to help you, deals with access and facilities for firefighters in buildings.
A. Okay.

Q. So this is diagram 52, and at the very bottom, we can see in the notes at point 4 it says this:
"This Diagram is only to illustrate the basic components and is not meant to represent the only acceptable layout. The shaft should be constructed generally in accordance with clauses 7 and 8 of BS 5588−5:2004."
Do you see that?
A. Yes.
Q. I think it follows from your earlier answers that you wouldn't have expected the tRIIO designers to have been aware of this part of Approved Document B on firefighting shafts.
A. That's correct.
Q. Yes.
If we can go to that British Standard, BS 5588, it's at {BSI00000087}. We can see the title is, "Fire precautions in the design, construction and use of buildings − Part 5: Access and facilities for fire−fighting".
If we go within it to page 22 {BSI00000087/22}, there's a section here, section 7.1.4, "Layout of fire−fighting shafts".
Then if we go over the page {BSI00000087/23} within this section and look at the third paragraph down, we

can see it says this:
"Goods lifts and service lifts should not be located within fire−fighting shafts. Only services associated with the fire−fighting shaft should pass through or be contained within the fire−fighting shaft.
A fire−fighting shaft should not contain any cupboards or provide access to service shafts serving the remainder of the building."
Do you see that?
A. Yes.
Q. Now, can we agree, just looking at that now, that the practical effect of that is that if the stairwell at Grenfell Tower was a firefighting shaft, then there should not have been a gas riser in it?
A. In terms of −− yes, in this document, yes.
Q. In 2016, is that something that tRIIO and its designers understood?
A. No.
Q. No, thank you.
I just want to focus now on some of the ventilation aspects of the first design.
If we can go back to Approved Document B, this is {CLG00000224/81}. This is within the B3 section, which is about internal fire spread, and it includes provisions about compartmentation.

Paragraph 8.41 we can see is talking about there ventilation of protected shafts conveying gas, and we can see it says this:
"A protected shaft conveying piped flammable gas should be adequately ventilated direct to the outside air by ventilation openings at high and low level in the shaft.
"Any extension of the storey floor into the shaft should not compromise the free movement of air over the entire length of the shaft. Guidance on such shafts, including sizing of the ventilation openings, is given in BS 8313:1997."
Now, can we agree, in simple terms, a gas supply needs to be adequately ventilated at the top and at the bottom of the shaft?
A. Yes.
Q. You have already mentioned that it really needs to ventilate naturally, there are all sorts of problems with mechanical ventilation.
A. Yeah, there's a difference between −− there's mechanically −− mechanical ventilation, direct, and then there is indirect ventilation.
In the context of the riser that was put in the stairwell, design 1 was a welded system, and G/5, which was the spec that the designers used to design that

riser system, ensured that there was direct or indirect ventilation at the top and the bottom: at the top, direct ventilation through the roof vent, and at the bottom there was a door on to the atrium level, there's a door going on to a landing that goes on to the atrium, and then there's the front doors, and it's the door movements, air movement, over 30 minutes which would have satisfied the indirect ventilation at the bottom. That's how the design was produced.

Q. Is it right that that would have to rely upon the riser being welded steel?

A. Yes, correct.

Q. Now, looking at that paragraph 8.41, again, just to be clear, I think from what you have said, you wouldn't have expected the tRIIO designers to have known about that provision at the time they were designing the Grenfell Tower riser?

A. That's correct.

Q. Yes.

If we can go to {CAD00000035} now.

These are some notes of something called the MOBs performance call dated 25 October 2016. You can see that in the subject of this email, and what we're going to get is a whole list, I think, of buildings.

Can you just explain what this MOBs performance call

was?

A. There was a twice-daily call between the client, Cadent, and the tRIIO operational team, and that twice-daily call was looking at gas off. So where gas risers have been disconnected due to a gas escape, how long would it take to get the gas back on those customers. So it was a performance meeting held by the client, where we would be asked the question as to what was still off, what was on, how long was it going to take to get it on, and that was a twice-daily call that was held.

Q. Yes, thank you.

If we look on page 2 of this document {CAD00000035/2}, at the top of the page, we can see the record of the discussions that were held about Grenfell Tower.

We can see about halfway down that entry, on 11 October 2016, it says:

"... potential buy out – awaiting confirmation in hand ..."

Then do you see below that it says:

"... route that was identified doesn't have ventilation – buy out for whole building."

Can you see those words in those notes?

A. Yeah. Yes, I can.

Q. Can you just help us as to what was being discussed

based on those notes?

A. I can't comment on the actual call, I wasn't involved in that. It appears to be a discussion around the survey, what was identified from the survey as a potential route, and the thinking at that time as to whether or not that was a viable option.

Q. Yes.

A. Hence can we go down the buy-out route and not put gas back into the building.

Q. Yes.

A. You know, in terms of what you've presented there, I think that's what I would take from that.

Q. Yes. In terms of the words where it says "route that was identified doesn't have ventilation", does that trigger a memory in terms of what the problem was about ventilation that was being discussed at this point?

A. I wasn't involved with that ––

Q. Right.

A. –– call, so I can't ––

Q. Right. So you can't help about whether that was the problem of mechanical ventilation being in the communal lobbies?

A. It could very well be, yes, yes.

Q. We saw that in Simon Boygle's initial survey of 12 October 2016, there was no express reference to

a ventilation strategy in that, but if we go back to his second survey that he did in November 2016, this is at {CAD00000038}.

At the bottom of that page –– this was the email that he sent –– we can see there is also a heading "Ventilation/G5".

Would you understand that "G5" to be a reference to the IGEM/G/5 technical standard?

A. It is, yes.

Q. He says this:

"Once the pipe work is installed, the riser system could be segregated from the mechanical air extraction by being boxed in. There is a route out to fresh air through the basement & would assume a route out through the top floor (no access to roof as locked)."

Now, was it acceptable, in your view, for the tRIIO designers to have relied on that statement by Simon Boygle as having given sufficient consideration to the ventilation question for the pipework?

A. No, it's the designers' responsibility to produce the design and the ventilation requirements.

Q. So is it right that you would have expected them, the tRIIO designers, to have given separate consideration to the ventilation aspects of this new riser design?

A. Yes.

Q. Do you know if they did in fact give separate consideration to those ventilation aspects?
A. In terms of the design 1, they would have done, in terms of what —— the resultant design was around —— I've just explained that earlier on, in terms of roof access and the door movement. So how do we —— he talks about there, Simon, a route to the basement. Design 1 required on the door movement at the bottom of the stairwell going into the atrium level to the front door, which was the design the designers ended up with.
Q. Yes.
A. So while Simon has mentioned the basement there, in terms of that iterative process of producing the design, it was the indirect ventilation that was available or was part of the end design that the designers produced.
Q. Yes.
Now, we've not seen any evidence, any written evidence, that tRIIO gave more consideration to ventilation, and in particular to the ventilation in the route between the basement and the stairs.
Can you help us as to why we don't see that in any of the design documentation?
A. I ... it wasn't —— I don't think that anything —— it wasn't documented in terms of the decision, the thought process that they went through.

Q. So when you say, "I don't think that anything —— it wasn't documented in terms of their thought processes", do you mean that you understand all their thought processes to have been documented, as they progressed with the design?
A. Yes, in terms of the iterative process of ending up with the final design, documenting the process that they would have gone through to end up with that final solution.
Q. Yes. So are you saying it was done but not documented?
A. Yeah, so I know it was done because —— in terms of the final design, in terms of the ventilation requirements of it, but I haven't seen any documented —— I haven't seen that documented.
Q. Yes.
We've also not seen any documentation relating to the ventilation at the bottom of the stairs where the riser comes into the stairwell.
Again, can you help us as to why we don't see any documentation dealing with that at the design stage?
A. I can't. If it's not documented, then we won't have had it in terms of written down.
Q. Yes.
We also can't find any documentation relating to the very top of the building. There was, as far as we can

tell, no design actually completed for how it was going to vent at the top. Is that your understanding?
A. That's right.
Q. Yes. And that should have happened, shouldn't it?
A. In terms of design, in confirming the ventilation requirements, yes, calculations to confirm that the ventilation in the design was satisfied, yes, there was no documented design inclusive of calculations.
Q. Yes.
The Inquiry's expert is critical of the fact that there isn't a detailed design or description as to how —— let's go back to the bottom of the building —— the pipe between the basement and the stairs was going to be ventilated as it passed through each of those spaces. Do you accept that criticism?
A. Yes, I do. In terms of design 1, there was —— information was conveyed between the designers and the operation team in terms of what should happen, but again, it wasn't documented. There is no documented evidence to ——
Q. Right.
A. —— support that.
Q. He's also not seen any reference to the need for vents conforming to the relevant British Standards —— that's BS 8313 or table 7 of IGEM/G/5 —— in these spaces

between the basement and the stairs. Again, do you accept that there should have been vents between those locations?
A. The general approach —— so design 1, the general approach to design is to fill in holes once they've been breached, unless required for ventilation purposes. So in design 1, all holes were to be filled, other than the holes that went from the lobby into the basements —— sorry, the lobby into the stairwell.
Q. Yes.
A. So all holes that were drilled were to be filled in design 1. That changed for design 2.
Q. Yes. I'll come back to that later. That's what's happening at levels 4 to 23 of the tower. I'm focusing about what happens between the basement and the lower part of the stairs.
We've not seen any reference to the need for vents in that lower portion of the pipe, and the suggestion is that that is in breach of the British Standard and in breach of IGEM/G/5. Do you accept that?
A. Maybe if I could explain, that will help.
In the basement —— so if you look at the basement as a separate compartment, there was a plant door room(sic), and therefore it was, in terms of the design, that that plant room door would provide the natural

ventilation required for the basement.
Q. Yes.
A. As the pipe route went through the first riser cupboard, it went through that riser cupboard, up through the ceiling and into the second riser cupboard, those holes were to be filled, and the ventilation would have been provided through the -- as you've seen earlier on, the louvred doors, which went out onto a landing, which went onto a door, which went out to the atrium, which went out to the front doors. So the ventilation in the riser cupboards 1 and 2 on -- get the floor numbers right, the floor above the basement and the next floor, that's how the ventilation -- the designers satisfied the ventilation requirements.
As it went into the storeroom, before it went into the stairwell, there was a door, so all of those holes should have been filled in or would have been filled in between the basement and as it come into the stairwell.
Q. Yes.
A. So they would have been filled in, and the ventilation was through the door, people going into the rooms, door movements, and then the route outside. That's the intent of the design.
Q. Right.
A. Then the stairwell was --

Q. Yes, the stairwell was separate, I understand.
Let's look at some photographs which help us visualise this. If we go to {RHX00000012/30}.
These images at the top of the page show the riser going -- so this is the area between the basement and the lower part of the stair. So on the left we've got the riser entering the utility shaft at ground floor, then we've got it going up the utility shaft, and then we've got the riser exiting the utility shaft at second floor.
You're saying that there was ventilation in these spaces because, what, there were doors onto these spaces; is that what you're saying?
A. Yeah, there were doors onto these spaces that had louvres in, in the riser cupboards. So the two riser cupboards that you're showing there had doors which had louvres on.
Q. Right. And even though it's not documented in the design, that's how this ventilation was supposed to work?
A. That was the intent of the design, yes, in terms of the ventilation.
Q. I see. Yes.
Can you help us as to why we also don't see any calculations which are carried out in relation to the

ventilation and suggesting that this design was going to be adequate in terms of the ventilation that it provided?
A. At the time there was no calculations that supported that design.
Q. Should there have been?
A. Yes, there should have been.
Q. Yes, and that was an omission --
A. Yes.
Q. -- in the design process? Yes.
Now, in terms of compartmentation, I just want to look at some discussions that occurred about breaching the stair wall into the lobby.
If we can go to {TMO00833486}.
This is an email chain between Charlie Saul at the TMO -- we saw before that he was the contact point at the TMO on this issue --
A. Yeah.
Q. -- and Harvey Smith of tRIIO, and also Martyn Wisken, the designer, is copied in; yes?
A. Yes.
Q. And Harvey Smith was the project manager?
A. That's correct.
Q. Yes.
If we look at page 2 of this chain first

{TMO00833486/2}, midway down is an email from Harvey Smith to Charlie Saul on 18 November 2016, and we can see that he referred to the design of the gas riser and he asked for permission from the TMO to complete the works. So he says:
"Please find the attached design for the above. I have been advised that buy-out is not an option for this block, so would be grateful if you could review the design and confirm whether permission will be granted to complete the works."
Then if we scroll up to the top of page 1 {TMO00833486/1}, we can see the email back from Charlie Saul to Harvey Smith, 24 November 2016, and he says:
"Good afternoon Harvey,
"I'm wondering if you could please answer a couple of queries with regards to the boxing around the pipework to be installed?
"• What is the finish to the boxing?
"• How will the boxing affect the fire safety of the block?
"With regards to fire safety we are querying if the boxing will compromise the compartmentation of the stairs/lobby areas. It's not clear from the plans if the boxing will end in the lobby or continue into the

stairwell. The worry is that if the boxing continues into the stairwell then this will allow the passage of smoke through the block.

"How could the flow of smoke be controlled within the open ended boxing?"

So some questions are being asked by the TMO about the boxing-in and compartmentation in this email.

If we go to the response from Martyn Wisken at {TMO10015271}, this is a response the same day, 24 November 2016, and Martyn Wisken says this:

"The intention is that the boxing will isolate the pipework from the mechanical ventilation in the communal areas. It will be vented directly to the stairwell at one end (which itself is well ventilated) and run to a 'dead end' at the point of entry to the individual flats at the other. In case of fire in the stairwell, any smoke will travel along the boxing to a dead end and would be isolated within the boxing. In turn any smoke within the communal area would not get to the stairwell as the boxing would be fire rated."

So Martyn Wisken is explaining how compartmentation was intended to be preserved in this first design; yes?

A. That's correct, yes.

Q. Yes.

At the same time, these questions were referred to

the TMO's fire risk assessor, Mr Carl Stokes, if we can go to {TMO10015305}.

Now, you can take it from me that in this chain we see that Janice Wray of the TMO forwards this chain of correspondence to Mr Stokes, and at the top we can see Mr Stokes' email of 25 November 2016, and he says this:

"All noted.

But what happens if the fire is in the flat, does that mean that the fire can travel via the boxing to the stairwell?

"This is notifiable work so I am assuming that all the work will go through the Building Regulations process and meet all the requirements of the Building Regulations?

"Can the utility company please provide a full method statement and schedule of works showing that all the work will meet the Building Regulations requirements."

So that's Mr Stokes' response.

Now, just pausing there, did tRIIO think at the time that this gas riser work was notifiable to building control?

A. We didn't, when we was producing the design, no.

Q. Can you just explain why you didn't think it was notifiable?

A. It was -- we -- just in terms of the response earlier on, we -- the designers and the design team understood by designing the riser system to G/5 that the requirements of the Building Regulations would be required, and in submitting that design to the TMO, Charlie Saul, for approval, our understanding would be that the TMO would deal with building control if they felt it was a requirement.

Q. Right.

Did anybody with expertise in fire safety ever check tRIIO's designs, so on your side of the fence, to make sure there was nothing about the design that would impact and compromise fire safety in the building?

A. No, no, we didn't.

Q. Now, we can see that Mr Stokes has raised a question about the effect of the boxing-in and the potential effect of smoke travelling from a flat which is on fire to the stairwell.

Let's just look at the response to that. If we can go to {TRI000000405}, and if we look at the second email down on that first page, on 28 November 2016 we can see that Martyn Wisken gets back to Carl Stokes and he says:

"Carl,

"Our pipework must be installed in accordance with IGEM/G/5, this in turn has been written in accordance

with the Building Regs -- all pipework will be fire stopped between fire compartments."

Okay, so that's the response.

At the very top of the page, Carl Stokes has replied:

"Thank you Martyn."

Do you see that?

A. Yes.

Q. Looking at that response from Martyn Wisken, can we agree that it's unclear as to whether what he's talking about there is holes between flats and the lobby which would be firestopped, or holes between the stair wall and the lobby being firestopped? He is not clear on that, is he?

A. It's not clear from the email.

Q. No. And it's right, isn't it, that there was no intention -- we've discussed this before -- of firestopping in the final design around the pipe between the stairs and the lobby, because those oversized holes were necessary for the pipes to be ventilated --

A. Yes.

Q. -- back to the stairs; yes?

A. The designer assumed that the boxing in -- or in terms of the producing the design with respect to the ventilation requirements, the boxing in of the laterals

in the lobby in effect became part of the stairwell fire compartmentation.
Q. Yes.
A. And the holes would need to be left open so that if gas did escape from the pipe in the lobby, it could find its way out to the stairwell, which was ventilated, as I discussed earlier on.
SIR MARTIN MOORE-BICK: But you wouldn't get a dead end, as he described it, unless you had firestopping between the flat and the lobby, would you?
A. There was -- in terms of -- so as the --
SIR MARTIN MOORE-BICK: All I'm saying is, Mr Wisken described the boxing-in as providing a dead end at the end opposite to the stairs, and you would only get a dead end if you firestopped the hole between the lobby and the flat, wouldn't you?
A. The dead end Martyn was referring to was -- where the boxing-in ended within the lobby would have been a dead end, so there would have been a dead end -- so the boxing-in -- if you can visualise the boxing-in being constructed, it may have ended up at that wall there, that would have been the dead end, and then there would have been an open end with the hole into the stairwell.
SIR MARTIN MOORE-BICK: But there would only have been a dead end if the hole through which the pipe inside the

boxing entered the flat had been firestopped, wouldn't it, otherwise smoke could go through into the flat?
A. They were -- so the holes into the -- sorry, the drilled holes from the lobby into the flats were firestopped.
SIR MARTIN MOORE-BICK: Exactly.
A. Yes.
SIR MARTIN MOORE-BICK: Which I have to say when I read this succession of exchanges, it seemed to me that he was talking about or must have been talking about the hole into the flat. If you read the whole series of exchanges, that seems to me --
A. Yes. Martyn's reference, in terms of when I've read the emails, and clearly looking at this, is that he has deemed the fire compartmentation of the stairwell and the boxed-in pipe in the lobby to be one, and any hole other than the hole drilled between the stairwell and the lobby would be firestopped.
MS GRANGE: Right.
SIR MARTIN MOORE-BICK: Yes. Well, I was only intervening because it seemed to me maybe you weren't entirely doing him justice by accepting that it wasn't clear what he was referring to, because I was suggesting that perhaps, in the context of all the exchanges, it was fairly clear.
A. I think when you read the whole email trail, yes. In

the context of the one email there, then, yes, it's -- I agree.
MS GRANGE: Yes.
Carl Stokes actually then attends and writes a report in January 2017, after the riser's been built. If we just go to that, it's {CST00003082}.
So we can see this is a letter of 30 January 2017 to Janice Wray at the TMO, and you can see from the first line he says:
"Thank you for asking me to comment on look [sic] at the installation of the new gas pipe work within Grenfell Tower ..."
Then he gives a description of it.
Then we can see, if we go to the bottom of page 3 {CST00003082/3}, under "Conclusions", at point 3 he says:
"Documentation should be provided by the gas contractor showing the fire rated materials used for the fire stopping of the compartment walls and the fire rating of the fire collars used."
Sorry, I should have read point 2 first, I apologise. He says:
"All holes in compartment wall must be suitably fire stopped using fire rated materials of a minimum of 90 minutes fire rating."

Do you see that?
A. Yes.
Q. Can you see above that is a picture, if we scroll up. He's got:
"Pipe penetrating the staircase landing, hole through the landing, the hole not made good."
And above that he's got:
"Gas pipe passing through the flat to lift lobby area compartment wall, what fire stopping materials have been used to in fill this hole around the pipe?"
Just looking at what Carl Stokes says at point 2 of his conclusions, he says "All holes in compartment wall must be suitably fire stopped using fire rated materials"; he doesn't distinguish there, does he, between the holes between the lobby and the flats and the holes between the stair and the lobby?
A. Yes.
Q. Now, is it possible that there was a failure of communication between tRIIO and Carl Stokes on this point, in that he thought that all these holes needed to be firestopped and didn't appreciate that part of the design left some of these holes open for ventilation purposes?
A. That may very well be the case. I'm not -- I don't recall seeing this document myself.

Q. Right.
A. And whether or not it was passed to the designers at the time or just to Ms Wray and whether or not she passed that to us ...
Q. Yes. Because certainly the photo we can see there on the screen, "Pipe penetrating the staircase landing, hole through the landing, the hole not made good", that comment, "the hole not made good", perhaps suggests that he doesn't appreciate that there's got to be a hole around that pipe for the staircase to ventilate properly, hasn't there?
A. That's exactly right, yes.
Q. Yes.
Now, it was shortly after this exchange that the design was settled and agreed.
If we can look at {TMO00828915}.
This is an email chain between tRIIO and the TMO on 30 November 2016, and if we can go within it to page 3 {TMO00828915/3}, we can see there is an email from Charlie Saul in the bottom half of that page to Martyn Wisken and Harvey Smith, and he says:
"Thank you Martin.
"Our Health and Safety department have asked the following questions of the proposal ..."
And we can see he wants a method statement,

a schedule of works, and then the third bullet is:
"Confirm that works will meet Building Regulations."
Then on page 2 {TMO00828915/2}, if we go up, midway down the page, the first email is from Harvey Smith to Charlie Saul. In the third paragraph down, he writes:
"We do comply with building regulations and will take advice from you, or your engineers on the fire rating required for this particular installation."
Then he goes on and talks about other points.
Then if we go up to the first page {TMO00828915/1}, at the top is an email from Charlie Saul on 30 November 2016, and in the second line he writes:
"Please proceed with works as laid out in the plans discussed."
Now, do you understand that this was the TMO's approval of the design for the works and their instruction to proceed?
A. Yes.
Q. And we know that subsequently, on 9 December 2016, works did commence at the tower; is that correct?
A. It is, yes.
Q. Now, we know that concurrently with these events there was also parallel consideration being given to the option of buying out the gas, and I've just got a few questions for you on that now.

Can you just describe in your own words what you understand the phrase "buying out the gas" to mean?
A. Yeah, so the risers in the building, in terms of the riser that was cut off, supplied 13 of the 20 flats. There is an option open to Cadent to pay in financial settlement for the gas customer not to have a gas supply, and I think it's a Cadent process but it comes down to some economics around whether or not it's economically viable to replace the riser system or buy it out in terms of financial remuneration in regards to that. So that is the option to buy out the gas supply.
Q. Right.
A. And that is available or was available, and may very well be still available, on MOBs projects.
Q. Yes. So your understanding is there will be some form of economic assessment being made of the cost of replacement versus the cost of buy-out?
A. That's correct, yes.
Q. Is that your understanding?
A. It is, yeah.
Q. Through November there were exchanges between the TMO and tRIIO about the option to buy out the gas.
Now, we heard evidence again from Peter Maddison from the TMO about this. I don't think we need to go to the transcript, but he said in his evidence that his

preference was that they removed the gas supply from the block. He said he felt that running the new gas supply through the block was unnecessary and felt that they should buy out the residents and put in electric.
As far as you were aware, at tRIIO, did you get the clear impression that the TMO's preference was to have the gas decommissioned and for there to be buy-out of those customers?
A. I can't recollect that from the TMO. We would have been dealing directly with the client, Cadent, and have asked that question as to whether or not it was an option, and that would have been the extent of our involvement in terms of the buy-out process.
Q. Right. So your involvement in that process was pretty limited?
A. It was a question of: is it an option for us? And the client would have looked at it and made that decision and informed us of that decision, which on this occasion it wasn't. It was conveyed to us that it wasn't available.
Q. In your experience, was it your understanding that the decision to buy out was focused predominantly on the wishes of the customers in the flats themselves and less about the wishes of the building owner?
A. My understanding of the process, and it is a Cadent

process, but my understanding is that they need to get every customer within the building's agreement to buy it out. If they couldn't get agreement of all the customers then they couldn't proceed with that option.

Q. Yes. Let's look at some emails on this.

If we go to {CAD00000058}, we can see the second email down is from someone called Mary Ryan at Cadent on 16 November 2016, and from the second paragraph down she says:

"With reference to your first point on compensation, all gas users will be entitled to the maximum Guaranteed Standard of Services Compensation of £1500.

"Please accept my apologies for not receiving any firm information from tRIIO to date on either a restoration or buy–out proposal. The decision on whether a buy–out is a viable solution rests with myself on behalf of National Grid, based on cost of replacement vs compensation to gas users. Is there any information you could share on confirmed gas users within the building to expedite this option."

So she appears to be apologising for the fact that tRIIO haven't responded on this point, but saying, "Buy–out is actually a question for us, Cadent"; is that correct?

A. That's correct, yes.

Q. Then if we can go to {CAD00000059}, if we look at the bottom of page 1, we can see an email from Mary Ryan to Martyn Wisken at tRIIO on 17 November 2016, and she says:

"Unfortunately, your colleagues have been stating that this is a buy–out location to the local authority and [National Grid] for approximately the last month. You are correct, we will only buy out a whole building not a single riser etc. I have no idea what detail the discussions have reached with reference to the above hence the chasing e–mails and information requested on the t–cons."

Now, is it your experience that Cadent won't buy out all of a building when only one riser has been cut off?

A. Yes.

Q. That's what she is suggesting there?

A. Yes.

Q. But in this situation, wasn't that rather illogical, in circumstances where it had already been decided to replace the other risers via the new riser, so there would need to be quite extensive works to put that proactive programme in place?

A. Yes.

Q. Do you know whether that was ever considered as part of the Grenfell project?

A. In terms of buying out the whole building?

Q. Yes.

A. That is the buy–out process.

Q. Yes, but she seems to be saying, "We're only going to buy out a whole building, not a single riser", but not recognising that actually there had been a decision to replace all of the risers in the building, so in terms of the cost–benefit analysis that was being done ––

A. Mary would have been aware of the proactive element of it.

Q. She would, would she?

A. Absolutely, yes.

Q. Just help us with this: in circumstances where buy–out's been rejected as an option by Cadent, is it right that tRIIO could ask for that decision to be re–opened if, for example, there were safety concerns about the riser design?

A. It would come back down to whether or not it was safe –– we could construct a safe and compliant pipeline system. If we couldn't construct a safe and compliant system then we shouldn't be putting gas back into that building, and I think that would have started a different conversation around the buy–out of the building.

Q. Are you aware of instances in other projects where

buy–out has been rejected as an option, tRIIO have been asked to do replacement works, but then tRIIO have gone back to Cadent and said, "Sorry, we've looked at this really carefully and it's simply not safe to do this, you're going to have to look at buy–out again"? Has that ever occurred in your experience?

A. Not in my experience.

Q. No.

A. Not that I can recall.

Q. Is it tRIIO's position that the route and the design was a safe and compliant one as things stood in November 2016?

A. It was, yes.

Q. Right. And it's right, isn't it, tRIIO didn't ever come back to Cadent and re–open the buy–out question because no safety concerns were raised about putting the riser through the stairs and the associated works?

A. Yeah. When the original buy–out option was rejected, the question was asked. We proceeded to produce what we considered to be a safe and compliant design, and from that point on, we proceeded with, you know, the pre–construction and construction activity, so we never reverted back to them asking the question.

Q. Yes.

Now, in terms of the construction work, the

construction of the new riser commenced on 9 December 2016. Does that sound right?
A. Yes, yes.
Q. The riser was then tested and commissioned by 25 January 2017, we believe.
A. Yeah, yes.
Q. And then gas was reinstated to most of the flats ending in 2 by 10 March 2017. Does that sound right?
A. That's correct.
Q. It's correct, isn't it, that the boxing—in of the laterals in the lobbies, on the lobby side, was not complete by the time that the gas was reinstated, and it's right, isn't it, that this was not done by the time of the fire? Is that correct?
A. That is correct.
Q. That was not in line with the ventilation and compartmentation design, was it?
A. That's correct.
Q. During that period, so when the boxing—in hadn't been completed, wasn't there a danger that gas might have leaked but could not ventilate naturally; it would ventilate into the communal lobbies and not to the staircase and then the outside as intended?
A. The holes between the stairwell and the lobby were —— you know, the oversized holes were still open, they were

open. What hadn't happened was the boxing—in. So, yes, the answer to that is although there was a route out to the stairwell, the ventilation of the boxing—in wasn't complete and therefore the full ventilation process hadn't been completed.
Q. Yes, so you've got a situation where, if there is a gas leak, the ventilation is inadequate during that period?
A. Yes, yes.
Q. Yes. And should that have happened, in hindsight?
A. No.
Q. No, it shouldn't have been left like that, should it?
A. No.
MS GRANGE: Mr Chairman, I think that's a good moment for the lunch break.
SIR MARTIN MOORE—BICK: All right.
MS GRANGE: I'm making good progress and I'm confident we certainly will be finished this afternoon.
SIR MARTIN MOORE—BICK: Good.
Well, it sounds as though counsel is going to move on to another topic, so that sounds like a very good point to have the break for lunch.
We will stop now and we'll resume, please, at 2 o'clock.
Again, as I asked you before, please don't talk to anyone about your evidence while you're out of the room.

THE WITNESS: Okay.
SIR MARTIN MOORE—BICK: All right? Thank you very much.
(Pause)
Good, thank you very much. 2 o'clock, then, please.
(1.00 pm)
(The short adjournment)
(2.00 pm)
SIR MARTIN MOORE—BICK: Right, Mr Dolan, ready to carry on?
THE WITNESS: Yes.
SIR MARTIN MOORE—BICK: Good, thank you very much.
Yes, Ms Grange.
MS GRANGE: Yes, thank you.
Just some brief questions at this point about the health and safety file under the CDM regulations.
Now, we've touched on this file before, and do I take it you were familiar with the requirement under the CDM Regulations for the principal designer to prepare a health and safety file appropriate to the characteristics of the project, which had to contain information relating to the project likely to be needed during any subsequent project to ensure the health and safety of any person? Were you familiar with that?
A. Yes.
Q. Yes, thank you.
Can you help us, did tRIIO, as principal designer,

seek to obtain the pre—existing health and safety file from the TMO? Were those efforts made?
A. We didn't specifically ask for a health and safety file, although we would have asked for any information that would have been available that could help us. But we didn't ask for a health and safety file.
Q. Right. Why not, if the whole purpose of that file is to ensure that knowledge is passed on from project to project?
A. It's not something that's been part of the tRIIO process to request the health and safety file from the building owner.
Q. Right.
Can we agree that, as principal designer, it was tRIIO's role to prepare, review and update the health and safety file as the project went along?
A. It was, yes.
Q. Yes, and that was the duty that started in the pre—construction phase and was ongoing until completion and handover of the file; yes?
A. Yes.
Q. Who was it at tRIIO who was actually responsible for the health and safety file for these works?
A. The design manager would have taken overall responsibility for the process, which would have

included making sure the health and safety file was created and was contributed to during the phases or various phases of the design and construction process.
Q. Was that Mr Wisken?
A. That was Mr Johnson.
Q. Mr Johnson, sorry, yes.
Did tRIIO actually prepare a health and safety file at the pre−construction phase?
A. We did, yes.
Q. Right, and did it keep it updated as the works were going on?
A. Yes, it was.
Q. At the end, was it tRIIO's intention to hand that over to the TMO?
A. Yes, it was.
Q. Right.
A. It would have been handed back, apologies, to Cadent, the client.
Q. Right, and then it was their responsibility to give it to the TMO?
A. My understanding would be that that was, yes, the requirement.
Q. Right, I see. Yes, thank you.
Now, you've mentioned in your first statement that there were several concerns raised about the gas riser

replacement works from March 2017 onwards.
Can you help us, when did you first become aware of these concerns?
A. It would have been later on in the project. We had an incident with asbestos, that was raised to me, and there was concerns raised around the pipe running through the stairwell in regards to vandalism of the pipe and the consequences of such vandalism.
Q. Yes, I see. I'm going to take you to one of the complaints that was received in a moment.
You've mentioned twice now, I think, this incident with asbestos. Can you just very briefly explain to the panel what happened, because I think it does crop up in some of the emails.
A. Yeah, one of the flats we had difficulty getting access to, we got called to −− Holland Gas got called to reinstate the gas supply, so that was running −− or relocate the meter to the new meter location, run the outlet pipework to the appliances and then commission the customer so that they had gas. In doing so, the engineer that was sent there drilled through an asbestos board. Now, we wasn't made aware of that until two weeks later, when an employee of Express Builders went to the property to make good. So the incident that was referred to previously is that particular incident.

Q. Right. Is it right that tRIIO actually had to leave site after that incident?
A. Yes, we was asked to leave site for a period of three weeks. I think it was approximately three weeks.
Q. Right. Why were you asked to leave site?
A. Because of the incident, asbestos being in the property, it had to be cleaned up. That created some concerns in terms of the activity that was being undertaken. We had to do some work, so we closed the job down, removed the health and safety file and the project pack from the welfare facilities that we had on site, and then over the coming days and weeks, we addressed certain issues and then recommenced the works.
Q. Yes, and approximately when were those three weeks that you were off site?
A. It was around about −− it was during March.
Q. Yes.
A. Yes.
Q. Yes.
Now, let's look at an example of some of the concerns that were being raised.
If we can go to {RBK00003601}.
This is an email from Lee Chapman, one of the residents, to the TMO, copying in a number of others.
If we look down at the body of the email, it's dated

27 March 2017, and I just want to read the second and third paragraphs. He says:
"We are sincerely concerned as residents living in the tower and that the fire risk that the recent installation of gas pipes has bought to the building. It is not just the installation itself that causes some alarm, but it is the risk that exposed pipes of any kind can cause to residents. The fact that these pipes have natural gas, which I'm sure you will understand is extremely [combustible] makes us feel in grave danger in the event of one of the pipes being compromised."
Then he goes on in the third paragraph:
"You may be aware, that recently the level of anti−social behaviour in the building is increasing, mainly involving children between 10 and young adults up to the age of 25. Given that many of the people who gain access to the building relatively easy due to the lack of security adds further alarm to safety concerns surrounding the gas pipes. Very few hours go by without someone smoking in the fire escape and sometime light small 'fires', or should I say highly flammable drugs. In the event the event that just one of the pipes begins to leak, all people in the building will suffer and more importantly are at risk of death or serious injury at least. Please can I insist that you MUST take this

issue seriously as should an event happen it is our lives at risk." [sic]

Now, was this a complaint that you became aware of during the time that you were involved with the project?

A. I was aware there was concerns over the -- as I mentioned earlier, in terms of the pipe and the risk or the concerns around vandalism and that that vandalism could cause a leak, yes.

Q. Because it's right, isn't it, that others had complained about the risk of antisocial behaviour and vandalism causing a potential risk to this infrastructure?

A. I understand so, yes.

Q. Yes.

Was that a particular risk to the riser, in your view, that particular risk?

A. No. I think it's in my statement, I make mention that, whilst I considered it and took it seriously and the rest of the team did, the pipe was a steel pipe, it was welded, and therefore it would be very difficult to damage, very, very difficult indeed to damage, and in terms of fire, it has a very, very high temperature melting point. So in reference to the issues around fire or vandalism, it would take, in my opinion, mechanical means of actually breaking into that, cutting machines, which I wouldn't expect standard sort of

vandalism to happen.

I also drew on my experience -- in between 2006 and 2013, that was the last seven years that I worked for National Grid, between 2006 and 2010, I was the network engineer responsible for emergency and replacement for a quarter of London, and in that four-year period I'd never once experienced vandalism of any pipe causing a gas leak. And then for the three-year period from 2010 to 2013, whilst working on the Gas Alliance project, I was the duty engineer for the whole of London, that's when I was promoted to that senior management role, and the duty manager for London, and again, not once -- and that was a 24/7, 365 day a year emergency service, and I can't recall once ever being called out to a gas escape resulting from vandalism.

So I based my judgement that whilst the concern of the residents was a valid concern, the actual risk was very, very low indeed, if not negligible.

Q. Right, yes, thank you.

Just sticking with this complaint email from Mr Chapman, if we go to the second page {RBK00003601/2}, and look at the second paragraph, he says this:

"Having seen these pipes numerous times, I am seriously concerned about how I will get out of this building alive in the event of a fire this added risk.

At no point were we advised that a Gas pipe would be installed in a communal area, nor were we informed of the need to be extra vigilant. At the 22nd floor it is a very long way down from the window in the event that after 30 minutes of fire our house in engulfed."

Now, when you were made aware of these complaints, to what extent did you step back and question whether it was right to have the gas riser in the stairwell?

A. The gas pipe in the stairwell was, in our opinion, designed and compliant to IGEM/G/5, and therefore what we'd installed in the building was a compliant system, and therefore there was no concern, it was a compliant system, unless we started to question the regulations or the specification. So in our opinion it was compliant and therefore safe. So I had no real reason to question. The only -- as mentioned earlier on, the only option available to us would have been not to put gas into that building, and as we felt we had a safe and compliant route, there was no need to act upon it.

Q. Yes, but as I think you just made clear, that was purely looking, from your perspective, at IGEM/G/5 and not looking at the Building Regulations or the approved documents?

A. That is correct, yes.

Q. Can we go to {TMO10016548}, now. This is an exchange

that Janice Wray of the TMO had with John Allen of RBKC building control.

If we start at page 3 of this {TMO10016548/3}, please, at the bottom of the page is an email of 16 March 2017 from John Allen to Janice Wray, and he writes:

"Janice, I am content that this work would be regarded as a repair providing there is no change to the fire safety implications. A building regulation application would not be required.

"In particular to ensure that the riser replaces a riser in the same position. Gas risers and meters are not generally positioned within stairways or if they are they should be in fire resisting enclosures.

"They should also reinstate and firestop any fire resisting enclosures that are affected as part of the installation."

So we can see that that's what building control were saying.

Now, pausing there, and from what you've told us, it's right, isn't it, that you understood that work reinstating gas risers was not generally regarded as work that required a building control application?

A. That's correct, yes.

Q. We can see here that Mr Allen is saying it would be

regarded as a repair, therefore doesn't need Building Regulation approval, providing there is no change to the fire safety implications.

Now, were you ever told that that was what building control were saying, that ——

A. I'm —— sorry.

Q. —— it didn't need approval, provided there was no change to the fire safety implications?

A. I wasn't personally aware of that email.

Q. Right.

Had you been asked at the time, "Are there any changes to the fire safety implications?", what would your answer have been?

A. My expectation would have been we had a relationship and engaged with a member of the KCTMO. In sending our design through to the KCTMO, we'd have expected collaboration at that point if they had some concerns that our design, what we were submitting for their approval, would have created that situation.

Q. Right. I understand that's the process, but if you'd been asked at the time, "Are there any changes to the fire safety implications involved in this riser replacement?", what would your answer have been?

A. Yes.

Q. Yes.

A. Yes.

Q. And tRIIO didn't ever see the need itself to contact building control directly?

A. No, we went through the contact we had at the KCTMO.

Q. Right.

Now, there were a few more exchanges between Ms Wray and Mr Allen over the next few weeks. If we can go to another one, {TMO10016548}.

This is an email from Janice Wray to John Allen of 3 April 2017, and she writes this:

"Thanks. We have now got their commitment to enclose the riser in a 2—hour fire—rated boxing.

"Our Assessor has already highlighted the breaches in compartmentation and [National Grid] have confirmed these will be addressed.

"A number of residents very unhappy and perceive this to be potential[ly] a very high risk and were asking RBKC to appoint an independent consult[ant] to investigate!

"LFB are saying ([though] not yet in writing) that they are unhappy about the riser being on the means of escape — but as it is already installed not sure this will have any input."

Now, we asked Ms Wray about this during her oral evidence and she said that the LFB were unhappy but they

didn't say that it presented a risk, and she also said that she raised this with the LFB because Cadent were not responding to her on the point.

Now, were you ever made aware of the LFB's unhappiness about the riser being on the means of escape?

A. I was not personally made aware, no.

Q. Now, I understand that you became personally involved in the project in around March 2017; is that right?

A. Yes.

Q. As we understand it, is it right that some time in March 2017, you were invited to attend a meeting with the TMO and Cadent to discuss these complaints about the original design? Is that right?

A. I don't recall personally being invited to a meeting with the TMO.

Q. Right, okay. But as far as we can tell, before any such meeting took place, the design was changed. Can you just tell us briefly what led to that change in design?

A. So design 1, the pipe in the stairwell was of a welded and screwed construction.

Q. Yes.

A. It was meant to be welded and screwed. What was actually built or what was introduced into that construction was what we call a compression fitting, and

that compression fitting was introduced into the pipeline at each of the branches onto the lobbies. So we went from a welded and screwed construction to a pipe with a different type of component in, which changed the requirements of ventilation. Therefore, we could no longer rely on the indirect ventilation down the bottom of the stairwell. We was okay with the direct ventilation at the top to natural air, but we needed to find a ventilation route to air at the bottom of the riser as well.

Q. Right. You talk about a compression fitting; is another word or phrase for that a flanged joint?

A. It is, yes.

Q. Can you just explain what that means, flanged, rather than being screwed or welded?

A. Yeah. So if you can visualise a straight pipe with a T piece, so we've got a welded T piece in, at the end of that T piece there would have been a thread, and that thread —— the threaded valve would have screwed on to that piece of pipe that protruded out of the vertical pipeline.

The flange fitting enabled us to put a fitting on and tighten it up as opposed to screw it or weld it. So by tightening it up, it creates a seal via a gasket which tightens it up. So there is no screwing or

welding of the connection at that point.
Q. Yes, I see. I think what you're telling us is that flanged joints are less reliable in terms of leaks than screwed steel or welded construction; is that correct?
A. It requires a different type of ventilation. They all need to be ventilated, but there is a different -- there is a higher spec of ventilation that's required when you introduce a compression fitting --
Q. Right.
A. -- as opposed to a screwed or welded fitting.
MS GRANGE: Yes, I understand.
SIR MARTIN MOORE-BICK: At the risk of stealing Ms Grange's next question, why introduce a flange fitting?
A. That is a very good question, and it wasn't part of the original design, it was introduced to speed up -- we understand it was introduced to speed up the construction of the riser pipeline in order to get gas back on to those customers that had been without gas for two to three months at that point.
MS GRANGE: When you say, "We understand it was introduced", is that because you're explaining what your subcontractor did?
A. Yes, it was the subcontractor introduced the fitting. It was managed by our site manager, we were on site, we were observing, checking, and we never picked that up at

the time. That was picked up later and was addressed, as we'll probably come on to.
Q. Is it fair to say it was an error on site that those flange joints were fitted?
A. Yes.
Q. And it should have been picked up by the tRIIO manager who was observing on site but it wasn't?
A. That's correct.
Q. Can you just explain to me why you're saying that affected particularly the ventilation at the bottom of the riser as opposed to the ventilation all the way up? Because wasn't the consequence that you then had to box in all of the laterals and the risers all the way up to floor 23?
A. Yeah, so in design 1, where we were boxing in the laterals to enable the lateral pipe, should a leak occur, to vent into the stairwell --
Q. Yes.
A. -- the ventilation requirements allowed us to have direct or indirect ventilation at bottom and top, so we was able to comply with a direct ventilation requirement at the top because of the roof vent, and down the bottom we had the door out onto the landing, which went to the atrium, which went to an external door, that was the indirect ventilation, and in our view that was compliant

with the requirements of G/5 -- the ventilation requirements of G/5.
When the compression fitting was introduced, the indirect ventilation down the bottom was no longer satisfactory, so we had to create a -- we had to put in place the ability to direct ventilate from the bottom to the top, and to do that we had to install then the riser, the vertical pipe in the stairwell, in a boxed-in enclosure, so it became a segregated system from top to bottom and all the laterals.
So the full riser system would then become boxed in, so it became segregated from the rest of the building.
SIR MARTIN MOORE-BICK: So did you save any time after all?
A. No. Sorry, let me just correct myself there.
The gas -- in terms of the approach that was taken enabled to get the gas back on by 25 January. It would have taken longer to put the gas on if we'd have -- and I'm not sure how much longer, I haven't got that level of detail, but it was decided, there was a decision or a view, that the gas would be got back on quicker with the flanged joints introduced. It was easier to introduce the flange to the other -- the correct design.
MS GRANGE: Yes.
Can I just press you a bit on this ventilation point. I understand that the consequence was -- and

we'll come to it in the design -- that you then boxed in the riser in the stair to create effectively like its own compartment within the stair, which you said would ventilate at the top to the roof vent; yes?
A. Yes.
Q. And you said that you could no longer have indirect ventilation at the bottom so you had to have direct ventilation at the bottom. How did you get over the fact that the riser is coming from the basement, through a number of riser cupboards and other storerooms, before it gets to the stair? There could never be direct ventilation down there, could there?
A. If you recall my response to design 1, where the holes through the basement to the riser cupboards under design 1 would have been sealed.
Q. Yes.
A. Under design 2, those holes would have been kept open. So the -- coming back to the fire sealing of the holes, the only holes that would have been fire sealed under design 2 were the holes that were made into the flats. The direct ventilation at the roof, and if the boxing-in had been fully completed, it would have run through the storeroom into the riser cupboards, into the basement and then we would have created a vent in the basement at the boxing-in to outside.

Q. Right.
A. So we would have installed a ventilation point within the boxing in the basement.
Q. So you were boxing-in -- I'm not concerned about the basement because, as I understand it, the basement's got its own ventilation and is a ventilated space for all sorts of reasons, because it's got dangerous substances in it.
A. Yes.
Q. I'm really talking about the point from the top of the basement to the bottom of the stairs, those floors that you've got to get through. I still don't understand how -- are you saying that you would create a boxing-in around that pipe all the way down --
A. That's right, yes. The boxing-in would have been to -- the design drawing -- on the design drawing, it talks around fully boxing in, on design 2, all of the pipe. That would have included the pipe running through the cupboard, into the stair -- into the riser cupboards. So it comes in, it comes down the stairwell into a storeroom, through a riser cupboard, through another riser cupboard and then into the basement and then out to the road. The design, the fully boxed-in design, design 2, to provide that ventilation, required the whole system to be boxed in as it run through the full

extent of the building, and then the ventilation would have been created down in the basement, so we had a fully segregated system.
Although there was ventilation in the basement and that would have sufficed for design 1, we wanted to create a chimney-type effect through --
Q. Right, I see.
Is it your evidence that that wasn't complete, that boxing-in at the very low levels, by the time of the fire?
A. That's right, yeah, we'd completed the boxing-in in the stairwell up to the 23rd floor or the 22nd floor. A number of the laterals were boxed in. But there was no boxing-in completed anywhere else.
Q. I see. Yes.
Can I just pick up on a couple of other things you said this morning about ventilation at those levels.
This morning you said that there were louvred doors on the riser cupboards between the basement and the bottom stairwell. Our expert, Mr Hancox, doesn't recall seeing any louvred doors in those sections of the building.
Can I just check: are you sure that there were louvred doors at those portions of the building?
A. Yeah, I think on the picture that was put up earlier on,

I think that was -- you know we talked -- we explained the riser route and we went to that floor? There is -- you can see the door there with the louvres on.
Q. The slats?
A. That's it, the slats, yeah.
Q. I see. So that's what you're describing there.
Isn't it right, though, that there was no ventilation at all in the room next to the community centre where the riser goes up a cupboard in the corner?
A. That's correct, yes.
Q. So there was no direct or indirect ventilation there, was there?
A. For design 1, the indirect ventilation, it would have been about the storeroom being used and the door opening and closing out on to that landing, which would have eventually found a way out to the front door into the atrium. But in design 2 it would have all been boxed in. So the ventilation on design 1 -- design 1 and 2 are different.
Q. Right, I see.
A. There was no requirement to box in under design 1 because it was deemed it was compliant at that point, but as soon as the flanges were introduced, that design 2 came into being and that's when the plan would have been to box it all in.

Q. Yes. So for design 1, you're relying on a storeroom cupboard door being opened; yes? Was any assessment done of how regularly that door would be opened?
A. No, and, you know, it's based on advantageous -- it's called advantageous air movement, but there was no calculations done to confirm that that air movement would have been satisfactory. It was based on engineering judgement by the designer.
Q. Sitting here now, do you think that was a satisfactory way to design at lower level?
A. I think the design and the ventilation should have had calculations to support what was put forward.
Q. Yes.
A. And it wasn't.
Q. Thank you.
Just going back to the flanged joints, at the time when that change was made, should there have been a design review of the impact of adding those joints to the overall design?
A. Yes. So I mentioned Mr Johnson -- Steve Johnson, that is, the design manager, not Ashley Johnson, the design analyst who we see on the drawings earlier on. Steve was notified of the introduction of those flange fittings and went to site, and immediately come back and reviewed the full design and personally took control of

the design change, and that's when design 2 became live, and that's when he override the design risk register. Again, the process of producing the risk register for design 2 still resulted in a risk score less than the required -- the threshold, but Steve overrode that --
Q. Yes, I'm coming to that.
A. Okay.
Q. I'll take you to those documents.
What I'm getting at is that before that change was made on site, there should have been a design review, shouldn't there, to have assessed the consequences of changing to that flanged joint?
A. Yes, they shouldn't have been introduced without a design amendment, we call it.
Q. Let's look at that revised design in drawing form, if we can go to {TRI000001223}.
This is effectively the same drawing that we saw before, but if we can zoom in on the middle box again with the lines, here the difference is, from the last design, that the solid black line is now going around the pipe all the way around the lateral; do you see that? So the bottom part which is in the stair --

A. Yes.
Q. -- as well as the bit in the lobby is now boxed in; is that correct?
A. Yes, the whole system would have been boxed in.
Q. Yes, and the green pipe, that's the riser, that was to be boxed in as well, wasn't it, within the stairs?
A. It was, yes.
Q. So, actually, if this drawing were correct, we would have black lines around the green line as well.
A. With this particular drawing, yes.
Q. Yes. So we've now got boxing-in in the stair and the lobby, not just boxing-in in the lobby.
A. That's correct.
Q. Yes, thank you.
It says in the red text at the bottom:
"Boxing to be open ended into protected shaft to allow ventilation of the lateral pipework."
So we have still got the oversized holes between the stairs and the lobbies to enable there to be ventilation across this boxing-in, but once it comes into the stairs, it's now in a confined box up to roof level; is that correct?
A. That's correct, yes.
Q. Yes.
If we look at the photograph immediately above, we can see blue lines which show where the boxing-in is going to be built in the stair; is that correct?
A. Sorry, can you just repeat that?

Q. Yes, the blue lines in this photograph, they're showing where the boxing-in is going to be built in the stair.
A. That's right, yes.
Q. We've got these orange bars with the label "Intumescent vents", and in the text box it says -- it's very blurry, but I'll read it out:
"All pipework (riser and laterals up to flat entry point) to be boxed in to 2hr fire rated. Intumescent vents to be installed in stairwell only - Sleeved entries between stairwell and communal landings to be left unsealed within the boxing in."
So taking that in stages, all the pipework was to be boxed into two-hour fire rated boxing; yes?
A. Yes.
Q. There were to be intumescent vents in the stairwell side only in this position; is that correct?
A. That is, yes, that's correct.
Q. And sleeved entries between the stairwell and the communal landings to be left unsealed, so the oversized holes are to be left as they are?
A. That's right, yes.
Q. Yes. And someone's highlighted, we can see, the "2hr fire rated" in yellow.
Was it unusual to specify two-hour fire rated board?
A. No, that was the standard. Where boarding was to be

installed and fire rated, it would have been -- that would have been our standard, two-hour ...
SIR MARTIN MOORE-BICK: Can you just help me understand exactly how this was going to work. As I now envisage this, the boxing-in of the vertical risers creates a sort of chimney which is ventilated to the open air at the top.
A. Yes.
SIR MARTIN MOORE-BICK: And presumably draws in air from the bottom somewhere.
A. Yes.
SIR MARTIN MOORE-BICK: These lateral risers are sealed, as it were, from the lobby; is that right? So if gas escapes, it can't escape into the lobby.
A. That's correct, yeah.
SIR MARTIN MOORE-BICK: Now, I understand that gas is lighter than air, but if you've got a significant leak into the boxing in the lobby, would there be enough draw, so to speak, to get that gas out of the lobby and up the chimney? And where would the makeup air come from in the lobby?
A. So the pipe in the lobbies -- there was no compression fittings in the lobbies, it was welded or screwed, and therefore it's extremely unlikely that a new pipe would leak.

SIR MARTIN MOORE-BICK: But, I mean, that's the whole point of the boxing, isn't it?
A. Yes. It's a requirement that you need the boxing in terms of -- I don't -- I can't answer that, whether or not it would have been sufficient. The expectation would be -- and I'm stepping a little outside of my area of expertise here -- that with that ventilation -- with the air movement coming past, there would be what I call a venturi-type effect, where it could pull out any air within that area.
The intumescent vents would have enabled (inaudible) a smell of gas as it came out of that location into the stairwell.
SIR MARTIN MOORE-BICK: But there's no -- I mean, I don't know, tell me if I'm wrong, but I don't think you've described any form of vent or air access into the boxing within the lobbies.
A. That's correct, there isn't -- there wasn't.
SIR MARTIN MOORE-BICK: So drawing a mixture of gas and air out of the boxing would require some sort of flow, wouldn't it?
A. It would do. The thinking for the designers at the time was that as that -- it wouldn't escape outside of the boxing up. It would eventually find its way out into the stairwell, the volume would find its way out into

the stairwell, and as it found its way out to the stairwell, it would be taken out, and the intumescent vents would also enable that to venting -- a small amount of gas to be vented at that point.
SIR MARTIN MOORE-BICK: All right, thank you very much.
MS GRANGE: Yes.
Just on the intumescent vent, I just wanted to ask you exactly how that was designed to work. Can you explain what its purpose was and what it was there to do?
A. Yeah. Mr Johnson, the design manager, when he produced design 2, Steve's got a very strong background in gas transmission and higher pressure pipeline systems, and his view was that he wanted -- because it was a -- the actual boxed-in pipeline was a significant length, he didn't want -- his view was gas shouldn't have been allowed to build up in that boxed-in area. So by introducing an intumescent vent, which wasn't a requirement of G/5, it would enable -- or it would prevent that gas building up.
The intumescent vent, they close up -- and, again, I'm not an expert on this -- but in terms of they would react to heat or fire and they would close up and seal should they get too hot.
And that was his thinking. Although it wasn't

a requirement of G/5, he felt it was a high level of protection that was being introduced because of the potential build-up. In the unlikely event that gas did escape from that pipeline, it would enable that to be depressurised through the intumescent vents.
Q. Yes, I see. So those vents would be open, allowing, you say, some ventilation from the lobby side out if there was a gas leak --
A. Yes.
Q. -- and up into the stairs because they're open, but in the event of heat or attack by fire, they would close, thus sealing the compartment away from the gas?
A. Yes.
Q. Yes, I see.
A. They were placed in that location as well because, you know, it allowed access to -- you can see there what we call line valves or Taylor valves. It allowed access to those valves for maintenance purposes at some point if needed.
Q. Yes, I'm going to --
A. Because --
Q. Yes, we'll come back to this in due course.
But, I mean, have you ever seen a ventilation arrangement like this in any other building?
A. I haven't personally.

Q. No. So there was no design template that was being used for this design?
A. I haven't personally seen a ventilation system, but ventilation is part of the gas design process, you know. I've been, as I said, in the gas industry since 1988, and Steve would have been also. You know, one of the things that we have to consider, a primary consideration, is gas escaping from a pipe and how we vent that to atmosphere.
Q. Yes.
A. So this particular system was different because of the specific problems that it presented, but in general, systems are boxed in and vented.
Q. Yes.
Intumescent vents are not mentioned anywhere in IGEM/G/5, are they?
A. No.
Q. Can we agree, based on that, that they're not a sanctioned piece of apparatus for the ventilation of gas risers?
A. I don't know that, if that's the case or not.
Q. Right, yes.
How did you understand the venting at the top of the stairs would work?
I mean, if we pan out of this photograph for

a moment {TRI000001223}, and look at this design 2 in the top of the stairs, we get no assistance from this drawing, do we, as to how the ventilation at the top was going to work?
A. No, it's a very simple schematic drawing, so it doesn't show how the ventilation or the access to the roof would have worked.
Q. No.
Again, just to be clear, in this second design, we get no assistance in any design drawings or design documentation as to how it was going to work at top level, do we?
A. Only that the boxing-in would have gone up to the roof vent, it would have extended into the roof vent and would have vented to atmosphere.
Q. Yes, but we can't see a design for that at the top of the building, can we?
A. No.
Q. Similarly, you said before that there would be boxing-in at these lower levels, linking the top of the basement to the bottom of the stairs. Where do we see that on this drawing?
A. It's not shown. It wasn't shown on a drawing.
Q. How do you know that that was the intention of the second design?

A. At the time I wasn't aware of the design that was ongoing.
Q. Yes.
A. I do know that the site manager was arranging for -- Andy Radley, the site manager, was arranging for Express Builders to go in and review the -- down to the basement and the rooms. That hadn't been priced up, but that was in process, and I think that's referenced in his statement around the basement as well.
Q. Right, yes. But, again, no design documentation --
A. There was no design for it.
Q. -- no drawings, no discussion that tells the reader how it's going to be boxed in at these lower levels?
A. The only thing on the design drawing is it says that all pipe to be boxed in and vent -- and holes to be left open apart from the holes into the flats, which needed to be sealed.
Q. Are you talking about the little insert drawing there?
A. Yeah, I can't quite see that, but I know --
Q. Sorry, if we zoom in on that again. The heading for that is:
"Internal lateral pipe work requires boxing in, on each floor as below."
That doesn't tell you anything about the boxing-in of the riser at low level, does it?

A. No, sorry, I was referencing the box in the top left-hand corner. I can't quite read what it says, but my recollection is that that's ...
Q. Yes. I can help you, if I just go back to my notes on that.
(Pause)
So that says:
"All pipework (riser and laterals up to flat entry point) to be boxed into 2hr fire rated."
So you're saying that that would tell everybody that it was going to be boxed in not just in the stairs, but further down the building, through the cupboards and the riser cupboards?
A. That was the intent from the designer. Whether it was adequate or not, I guess that's open to question. But the intent in terms of that instruction was that the whole system was to be boxed in. And there would have been verbal dialogue ongoing between the parties that were involved in this -- these activities.
Q. Yes. You said whether it was inadequate or not was a separate question; sitting here now, do you consider that this design was adequate from a ventilation point of view?
A. I don't think -- the instruction wasn't adequate, no.
Q. Let's look at the design risk register. You mentioned

that there had been a separate design risk register filled out for this revised design. If we go to {TRI000001218}.
So this is the CDM design risk register. We can see it's dated 24 March 2017 this time. This time the designer is said to be Mark Behm.
We can see it still gets a 17, but if we go to the bottom of the page, we can see that in the final row this time, under the "Manual DRA override needed?", it has been ticked. Next to it there is a comment in capitals which reads:
"Welded riser system and specific ventilation requirements."
Do you see that?
A. Yes, yeah.
Q. So the manual override has kicked in this time; yes?
A. Yes.
Q. And there was a separate design risk assessment done for this revised design; is that correct?
A. Yes.
Q. Yes.
Then if we go to the fourth page {TRI000001218/4}, we can see the analysis that's been carried out.
For the "MOB Specific Hazards", items 19 to 21, we can see there we've got those familiar headings. 19 is

"Breach of Fire Compartments", and if we track across to the right, the box has been ticked "Identified Present by Designer", and then someone, under "MOBs Specific Risks", has written "Loss of fire containment as a result of breach". Do you see that?
A. I do, yes.
Q. Someone's identified that as a specific risk.
Then further along, if we can go to the right, we see some action to be taken, "Description of Action":
"Follow Building Regulations & Fire Safety Order. Seal compartments accordingly."
Do you have that?
A. I do, yes.
Q. So is that a reference to the Building Regulations and the Regulatory Reform (Fire Safety) Order 2005?
A. It would be, I understand, yes.
Q. We've just got a generic "Seal compartments accordingly"; it doesn't tell us which compartments are going to be sealed and which not, does it?
A. That's right, correct, yeah.
Q. Then item 20, "Failure Mode – Expansion", that's not ticked, and then below that we get "Inadequate ventilation", item 21, and we can see that has been ticked. In the next cell along we can see some specific risks identified, including:

"Asphyxiation. Confined space. Flame through mixture. Overpressure explosion."
Then if we go along to the right and the action column, we can see for this it says:
"Generic statement to design for Operations to enable ventilation review on site. Gas Safe Engineer review."
Can you just help us as to what that means in terms of action?
A. I'm looking at these statements, I don't –– they are not helpful in terms of what was needed to be undertaken. They are very generic by nature. What happened with the design manager was that it was around the loss of ventilation compliance, hence the change to the design.
What appears to be in the design risk assessment is some statements, generic statements, which completes the documentation, and I think we have to accept that it's not of the required standard in terms of this particular part of the process.
Q. Yes. Yes, thank you.
If we go down to the bottom of the page, the second blue header from the bottom is also relevant here. It says, "Review/Comments/Additional Information", right at the bottom, and we can see that someone's added some notes to, first of all, breach of fire compartmentation.

We can see someone's said:
"Welded internal riser system, stairwell considered a shaft in G5, common areas to be vented back to shaft, additional fire protection boxing required for protection of valves and flanges in shaft area."
So a little bit more detail there, but it's still pretty generic, isn't it?
A. It is, and again, the reference to the gas work design being adequate to convey that information to the rest of the team was not to the required standard.
Q. Yes.
Then the line below that picks up on inadequate ventilation, there are some more notes there, and we can see there what they say. They say:
"See gasworks design for specific ventilation requirements. Sealed boxing and intumescent vents to be fitted."
So that's what we get there.
Now, in the documentation we see, was that the entirety of the consideration that was given to these aspects of the design?
A. My understanding was in terms of what was –– yes, what was documented would have been on this design risk assessment.
Q. What other consideration was given to the

compartmentation and ventilation aspects of the design?
A. The full system was to be –– in terms of the statement earlier on, the full system was to be boxed in, so it was to be boxed in with fire rated boarding. The sealant used for the edges and the screws would have been fire rated to two hours. So the full system would have been boxed in when complete. There would have been ventilation installed at the bottom the boxing–in in the basement, and then, as mentioned earlier on, the boxing at the roof –– the ventilation at the roof –– sorry, the direct ventilation at the roof was through the roof vent.
Q. Yes, but none of that was recorded anywhere, was it?
A. I'm not aware of it being recorded. It may have been, but I've not seen that being recorded.
Q. Was there any consideration given, so far as you're aware, to how inspection and maintenance would be achieved in the future with this gas riser?
A. Yes. So the intumescent vents would have allowed access, easy access. They would have been taken off and you could have got access to the valves. Otherwise, the boxing–in would have needed to be breached to gain access to the pipe for inspection.
Q. Yes. Can we agree that there are large stretches of the vertical riser that were not accessible, some not

accessible at all for inspection, because they were boxed in?
A. We do have something called an endoscope, which is in effect an internal camera which can be introduced into the pipeline to inspect it should need be, so there are options around future inspection using that kind of technology.
The access to the pipeline itself, in terms of what I've referred to earlier on in terms of the breaking -- getting into it would have been for the proactive element of it, so getting into the line valves that were introduced so we could extend it and then reinstate the boxing-in. But should there be a need to do some visual inspection then, you know, pipelines are camera'd, there is technology out there to camera.
Q. Yes.
A. That wouldn't have been a tRIIO activity, that would have been Cadent's, under their inspection regime.
Q. Yes.
Did you ever think about whether the basement being an area of special hazard made it unacceptable to box in the utilities sections and treat them as being venting in the basement? Was that ever considered?
A. No. So in terms of -- there's two different ways of looking at design 1 and design 2. Design 1, the

decision was taken that it was a pipeline and fittings that were introduced into that basement and there was ventilation within that for other -- there was the 10-inch gas supply to the boilers and various other different utilities within there.
In reference to the second design, fully boxing that pipe in, it would have been fully boxed in, so it would have been segregated from the basement, in effect, becoming its own compartment, and then it would have -- a vent would have been installed within the boxing-in to outside to enable that.
Q. I see. So you would go through the basement with the boxing-in to outside?
A. Yes.
Q. How do you do that? Haven't you got to go back up to ground level again?
A. There would have been a route -- we would have had to have found a route out to external. So that was -- reference earlier on around Express Builders going down that to price that up and review that in terms of how they would have achieved that. That was the next stage. It hadn't been designed at the time in terms of how we were going to achieve that.
Q. Right, I see. Yes.
Going back to inspection and maintenance, do you

accept that it was a weakness in the design that so much of it would be boxed in it would make it very difficult to inspect and maintain, even though I know you've said that there are ways you can sometimes get around that?
A. You know, the boxing-in was for ventilation. That is a primary -- you know, that -- in terms of -- if you have a hierarchy of what you're looking to achieve, it was ensuring that it could ventilate, and then because the boxing-in could have been -- the pipe could have been exposed by cutting out the boxing-in, it was -- that was the way that we decided to do that.
Q. Yes.
Was there ever any analysis done as to whether the holes in the walls through which the pipes passed were big enough for ventilation purposes?
A. No, it was -- it would have been -- it was engineering judgement on behalf of the designers, and it's custom and practice that if you was putting a 2-inch pipe through a wall, you would drill a 3-inch hole. That was just general -- that was practice, years of experience over -- but there was no design around that, there was no calculations to support that.
Q. I think it follows from what you have said that there was also no check that the ventilation of the riser from the bottom to the top would be adequate as a complete

system?
A. At the time of the design, there was no calculations to support the design. Subsequent to that, I understand some work has been done, but at the time it wasn't.
Q. Was there ever any consideration of the effect on compartmentation of these oversized holes between the stair and the lobby before the completion of the boxing-in?
A. Sorry, could you repeat that?
Q. Yes. Was there ever any analysis of the effect on compartmentation of the oversized holes between the stair and the lobby before the completion of the boxing-in?
A. The primary objective was we were trying to get gas back on, so we left holes within the fire compartmentation and therefore that presented a risk. So it was -- we was aware of it, but it was -- the programme was in terms of the priority to get the gas back on and then follow up with the boxing-in.
Q. So you did actually ask yourselves the question: what happens if we have a fire in this building before all the boxing-in's been completed?
A. I personally didn't and I'm not sure the guys -- I can't answer for them in terms of whether that was -- they would have understood what they were doing. Clearly

we'd contacted the KCTMO around the drilling through the fire compartments, but it didn't —— you know, we carried on with the job in terms of the programme that we had. The sequencing of the project was install the riser system, test it, commission it, and then follow up with the boxing—in and the other remedial works or the supplementary works to complete the project in its entirety.

Q. Yes.

Was there ever any consideration of the fact that this stair was not just a protected shaft but also a firefighting stair which would be used by firefighters in the event of a fire in a compartment?

A. We understood it to be a protected stairway, and there very well could have been a level of confusion as to whether there was two purposes for it, the protected stairway. The designers would have deemed it to be a protected stairway, and whether they considered firefighters needing to get up and down it, I'm not sure. I can't answer that 100%.

Q. Can you explain why we don't see all of those risks identified in this design documentation and considered and explained?

A. I think the process was weak. I think we've subsequently changed that, or it has subsequently been

changed. The only explanation I can give, and it's not —— you know, I think it's probably a weak explanation, is that the volume of projects that were being dealt with on the contract, you know, I referenced the number earlier on, it was around prioritising the high—level risk assessment, and that's where the risk register process came in. So every project went through a risk register. When it exceeded the threshold, another level of detail was undertaken on that.

But it was weak, and I think we have to accept that, that it needs to be strengthened and it has been strengthened. So at the time, it wasn't sufficient for what was needed.

Q. Yes.

Would you agree with the Inquiry's expert that a full design risk assessment for a multi—occupancy building should have also included many more topics than we just see in this pro forma?

So we've seen the compartmentation, the expansion, the ventilation, they're the three things that in multi—occupancy buildings are being flagged in this pro forma. Would you agree that there are many more important topics that ought to be in a pro forma such as this?

A. Yes.

Q. And those would include —— I'm just going to give you a selection —— means of escape in the event of fire?

A. Yes.

Q. Corrosion?

A. Yes.

Q. Thermal expansion and contraction?

A. Yes, although thermal expansion and contraction was considered and was introduced. The design did provide for expansion of the pipe.

Q. Access for inspection and maintenance?

A. Again, yes.

Q. Valves, including access to them and security?

A. So in terms of clarifying that point —— yes, it would have been part of it, yes. In terms of the risk assessment, sorry, yes.

Q. Yes, thank you.

Now, I just want to focus now on the effect of the oversized holes through the stair wall and into the lobbies.

Before I do, I just want to make clear that the Inquiry expert, Mr Hancox, found no evidence that the new riser pipe had been broken or breached in the fire. The new steel riser pipe was intact after the fire, and there was no failure to contain gas in the pipeline. So I just want to make that clear.

Is that your understanding as well?

A. It is, yes, yes.

Q. But the oversized holes that were there between the stairs and the lobbies is potentially significant in terms of the ability for smoke to spread between lobbies on the night.

Again, can we accept, in general terms, that must be right?

A. The boxing—in was complete from the bottom of the stairwell up to the 22nd floor, so any smoke coming from the lobbies would have entered the boxing—in and would have gone out up on the 22nd floor, so there was —— it was the last floor, so unless the compartmentation was breached, enabling smoke to travel from the lobbies to the stairwell, then I don't agree with Mr Hancox's view of what he said. It was boxed in, it was contained.

Q. So can we just agree —— I think you make this clear in your statement —— it was boxed in in the sense that the work to the riser and the laterals in the stairwell was complete; yes?

A. Yes.

Q. But the work to box in at the lobby side was not complete, was it?

A. So on several floors it was. So in terms of whether —— it's a question whether —— yeah, it wasn't complete on

all the floors. It was complete on, I think, around about five of the floors.
Q. Yes. So for a number of floors, I think you make clear that some of the battens had been installed but not the boxing-in.
A. That's correct, yes.
Q. In some others, battens had not been installed either. I think you said that was floor 6.
A. Yeah.
Q. Do you accept that there would have been -- I mean, I appreciate what you say about once smoke from a lobby comes into the pipe, you're saying your expectation would be it would go straight up the boxing in the stair and out at roof level; yes?
A. I'm certainly not an expert on whether smoke could have travelled from one lobby to another lobby by entering the compartment in the stairwell and then back out again through the oversized hole. I can't answer that question. I don't have that level of knowledge or background to be able to answer that.
Q. Yes. I appreciate you're not an expert on smoke spread. I entirely appreciate that.
Let's just have a look at a couple of images, just so we can picture what we're talking about here.
If we can go to {MET00016722}.

This is an image from floor 9 on the stairs. These were taken on 30 May 2018, after the boxing in the stairs had been removed. So, just to be clear, as it was on the night, there was boxing in this part of the stairs; yes?
A. Yes.
Q. We can see there's staining on the inside of the boxing; yes?
A. Yes.
Q. What we're exploring is whether there could have been smoke travelling from a lobby, going through the oversized hole, into this boxing-in, up to the next level, and potentially across to another lobby, because there would be another oversize hole in floors above this, wouldn't there?
A. There was, yeah.
Q. Thank you.
We see a similar thing if we go to another image, this time on floor 17 -- there are a number of these images I could show you, I'm just going to show you a selection.
A. Yes.
Q. If we go to {MET00016516}.
Again, we can see that this is -- I've given you one at the bottom or towards the bottom, it's really from

floor 9 upwards we see this, and one higher up. This is floor 17 here now, and we can see staining again within the boxing-in; is that correct?
A. That is, yes, yes.
Q. Yes.
Now, had this design finished, there would have been boxing-in on the lobby side and on the stair side, so this shouldn't have happened; is that correct? The smoke should not have been coming through that oversized hole and into this boxing-in?
A. That's right, yes, because, yes, it would be boxed in.
Q. But because the works were part-way through, it had been left like this and then the fire occurred; yes?
A. That is correct, yes.
Q. Now, can you explain why tRIIO didn't put in temporary firestopping around these oversized holes while the construction process was ongoing and before all the boxing-in was complete?
A. The explanation I can give is that once gas had been introduced into the pipeline, there was -- you know, blocking those holes in would have prevented any sort of ventilation.
So, you know, there should have been a programme of -- as the project was being sequenced and actually built, those breaches of fire compartmentation, there

should have been a process of introducing some form of interim firestopping that satisfied both the ventilation requirements and the fire containment. At the time, the process, that wasn't -- in terms of these reactive-type works, once gas -- you know, the focus on getting -- getting the gas back on was a big focus, and therefore the sequencing is questionable as to what -- that approach.
Q. Can we agree that the gas should not have been reconnected until all the boxing-in was complete?
A. Yes, I think that's correct.
Q. Do you accept that tRIIO, in accordance with its CDM duties, ought to have been identifying safety risks like this and managing them properly during the project?
A. Yes, it was a role of the designer and also of the contractor or the principal contractor to identify hazards and mitigate those hazards for a proper risk controlled approach.
Q. And in this respect, tRIIO failed to do that, didn't it?
A. We did not fulfil those obligations to the full, yes.
Q. Can we look at an email. This is at {TRI000000985}.
This is an email from Mary Ryan at National Grid to Stephen Johnson -- so you have said he was the design manager; yes?
A. That's right, yes.

Q. Thank you.
This is copied to you, we can see that, you're cc'd in to this email. It's dated 21 March 2017.
Does that indicate that the contents of this message were being escalated to you because you're being copied in?
A. I think, yes, that would have been the intent, I'm sure, of Mary by copying me in, making me aware of this issue.
Q. That date of 21 March 2017, can you help, was that the day that it was discovered that the design had to change because of the flanged joints?
A. Yes, I believe that's correct.
Q. Now, partway down this first page, there is a heading "Fire Escape". We can see the image underneath it. It's an image of a riser. That looks like a riser and a lateral in the stairwell; is that correct?
A. That is, yes.
Q. And if we go down to page 3 of this email {TRI000000985/3}, we can see some text, and I want to read the top paragraph. There we can see Mary Ryan says:
"The agreement with the [local authority] was to install the new supply in the fire exit stairwell and box in to meet their evacuation requirements. This has not been completed, although there are ventilation holes

throughout the stairwell, which if a fire incident did occur would create a more unsafe situation."
Now, can we agree that that's a very specific warning to you and to Mr Johnson that the state of the works being incomplete could present a fire risk?
A. Yes.
Q. Can we agree that tRIIO ought to have paid some attention to this email and made sure that the works were safe as they progressed?
A. Yes.
Q. Can you help us, what was the response to this warning? Was anything done about this at all after this warning was received?
A. The approach we took was to commence and complete the boxing-in of the riser.
Q. I see. So just to get on with the works?
A. Yes. Well, so the 20 -- this was -- I just want to make sure I get my dates right here. So this was prior to the design 2 being introduced. So design 1, the riser in the stairwell was not to be boxed in, as previously mentioned, it was the laterals in the lobbies that were to be boxed in. So those holes into the stairwell, as design 1, was never to be --
Q. Yes.
A. -- boxed in. If you can go back to that picture, you

see that that's the flanged fitting, the black fitting on the pipe. It was flagged up at this point that that fitting was introduced, and it was subsequent to this being identified to Steve that the boxing in the stairwell was part of the design change, the design amendment. So we was never going to box in that riser in the stairwell, they were always going to be left open for ventilation purposes.
Q. Yes. I appreciate the design changed and that's how it was going to be when the design was complete, but why didn't tRIIO think about the design in the interim and the fire risk that it posed while the works were incomplete?
A. In terms of -- yeah, it's a very valid point, and the approach to reactive risers being cut off was: "We need to get the gas back on", referenced earlier on the performance calls every day, two a day, in terms of understanding where we are with getting gas back on. So the reactive programme, we took a different view or a different approach to getting the gas back on, which unfortunately had left some of these other issues unaccounted for.
In terms of planned work, you don't cut the gas off until you've completed the new work, so you approach it in a different way. So in terms of -- if this had been

approached in terms of commissioning the pipe once everything else had been done, so therefore there was no gas introduced into the riser and no ventilation issues, then it could have been done in a sequence that wouldn't have breached -- or you could have followed it through, but because it was a reactive, it was done maybe two months before, the commissioning was done two months before, and it left these bits to follow, therefore leaving a risk that we was following on from.
Q. Yes.
A. And that was the approach at the time, and that was the approach across the full MOBs programme, reactive MOBs programme. This wasn't specific in terms of -- well, it wasn't different in the way that this job was done. It was, as I just explained, in terms of reactive works.
Q. Right, yes.
There are a few email exchanges between Cadent and tRIIO following this email. I just want to pick up on another one.
If we can look at {TRI000001035}.
This is an email from Stephen Johnson to Mary Ryan that same day, and he says:
"Mary,
"Let me re phrase the narrative below.
"There is still work to do, tRIIO are aware of it,

the work is not compliant at the moment or complete, irrespective of why, I have not defended the work quality on site or the reasons for being removed from site."

Then he goes on and deals with other points.

So he appears to be saying: look, we're aware of it, we know the work's not compliant at the moment, we're getting on with the work. And there, there's talk of being removed from site. Now, is that harking back to the asbestos incident where tRIIO had been removed from site for three weeks?

A. Yeah, what Steve's referencing there, the non-compliant element is the introduction of the flanged compression fittings, and the being removed from site was the asbestos incident, which is referenced in the third paragraph below.

Q. Yes. What did you understand him to be saying about work quality? He says, "I have not defended the work quality on site".

A. Work quality being the introduction of the flange fitting.

Q. Right, I see.

A. And being removed from site, he could very well have been referencing the asbestos incident as well. It could be a combination of both. But they were the

two -- you know, when I've read this, that's what I understand of his response to Mary.

Q. How concerned were you at this point? We can see you were copied in again. Were you concerned about what had been going on on site at Grenfell Tower?

A. Steve kept me aware -- not every project, I wouldn't have had a level of detail of every project that tRIIO were delivering. When it was escalated to me, and Steve felt it appropriate to escalate to me these two issues, it was the asbestos incident, which clearly was RIDDOR reportable, so a serious incident had occurred, and also the fact is that we had a design that we deemed compliant and through our own -- of our own making, by introducing a non-compliant fitting, we had additional work to do, which was causing these issues that needed to be addressed.

MS GRANGE: Yes, I understand, thank you.

Mr Chairman, I'm just looking at the reminder of my notes. I think I probably have another 15 or 20 minutes to go. I'm just wondering how we synchronise all this with the break this afternoon. I can either press on and then we have one break, or I'm happy to break now, take the afternoon break, and then I carry on.

SIR MARTIN MOORE-BICK: I understand. All right, thank you very much.

Well, now, Mr Dolan, I don't know how you feel, whether you need a break at this stage in the afternoon. The possibilities are that we continue now for another 15 or 20 minutes and then have a break. We always have to have a break at the end of counsel's questions anyway, so to do that would lead to us having two breaks, though we're not short of time, so I think the question is whether you feel you would like a break at this stage.

THE WITNESS: I'm happy to proceed.

SIR MARTIN MOORE-BICK: Are you sure?

THE WITNESS: Yes, yes, absolutely.

SIR MARTIN MOORE-BICK: Well, if you want to change your mind in five minutes, just indicate, all right?

THE WITNESS: Yes, will do.

SIR MARTIN MOORE-BICK: I think it best if you carry on, Ms Grange, and combine the two breaks.

MS GRANGE: Yes, thank you.

Some more questions about ventilation in the new design.

We've talked about these intumescent strips in the boxing-in. Now, were these intumescent strips ever installed?

A. No, they weren't.

Q. Can you explain why they weren't installed?

A. They would have been -- they were part of the construction element of the -- they would have been cut in to the boxing-in, so they would have involved the boxing-in to be complete and they would have followed on after in those locations. I've not seen a programme to support that view.

Q. Right.

A. But that's the way that I understand, through talking to the designers, that's how it would have been approached.

Q. I see. So you box it all in and then later you cut in your intumescent vents?

A. Yes, my understanding, that's how they were installed.

Q. I see. But we can be clear, I think, that they're not there. They weren't there at the time of the fire, were they?

A. No, they weren't.

Q. No. And they were an essential part of the design and the ventilation for the design, weren't they?

A. They weren't required, so by not installing them didn't make the system non-compliant with G/5. So a fully installed system -- a fully boxed-in system, ventilated at the bottom and the top, as described earlier, would have been compliant with G/5. When Steve introduced or decided to introduce the intumescent vents, it was on the basis of other higher sort of level specs that he

would have been involved in in the past, and there is a requirement under those specifications to install a way of venting an enclosed system every 15 metres, hence why he decided to put those in. But they weren't part of —— they weren't a requirement of G/5, that was just something additional that he decided to —— that was required in that location.
Q. Right, I see. Just to be clear, the Inquiry's expert isn't satisfied that it was compliant with G/5 in terms of the ventilation. You understand that, yes?
A. I've read Mr Hancox's report, yes.
Q. Yes.
A. Yes.
Q. But you're saying, had the design been fully completed, your view is it would have been compliant with IGEM/G/5; yes?
A. Yes, it would have been, yes.
Q. Right.
Just thinking some more about the ventilation of the riser through each of the floors in the stairs, let's look at a picture of this at {CAD00001910}.
This is a photograph of the riser coming through the stair floor before any boxing—in occurred. It's right, isn't it, that the intention was that there was a gap left around these pipes so that there could be

ventilation through the floor; yes?
A. Yes. There would have been —— so there is the 2—inch pipe going through a 3—inch hole, and the boxing—in would have been 4—inch, a 4—inch boxed in, so that would have been the differences between the —— sort of the gaps between the pipe and the sleeving and the boxing—in.
Q. Yes.
Now, as it exists there before the boxing—in, it's got the benefit of all the air around it, but once the riser on the stair was boxed in and created its own chimney or its own shaft, to what extent can we agree that the concrete floor and the ceiling at each level would have potentially impeded the air flow in that design?
A. The designer's view, based on their experience, was that those, for want of a better word, gaps between the pipe and the sleeving going through the concrete floor was adequate for ventilation. But, again, I have got no —— I can't provide any calculations to support that view.
Q. No. Wouldn't it have been better to cut out the floor inside the boxing to create like a square or a rectangle with greater ventilation around that pipe all the way up the boxing, if that's what you were going to do?
A. I think what should have happened, I think we should

have, in terms of the design process, is calculated what size annulus was required between the pipe and the sleeving, and then if it required —— as you just said, if it required the whole of that square area out where the boxing was to be installed to be cut out, that would have been —— yeah, so there should have been, you know, some —— an analysis and calculations to determine the size of the annulus and that's what should have been installed.
SIR MARTIN MOORE—BICK: Yes. I mean, presumably the vertical riser was the first thing to be installed, was it?
A. Yes, it was, yes.
SIR MARTIN MOORE—BICK: So you had cut all those holes and sleeved them before the introduction of the flanged joints?
A. It would have been a —— the process would have happened in parallel.
SIR MARTIN MOORE—BICK: Right.
A. So the laterals on the lobby, you know, we had —— there would have been a fabrication area outside, so it would have been built in modular form and then connected as —— almost like a Meccano set as we went up. So I can't —— I don't know exactly the sequence, but that's how —— and I think that goes some way to explain the compression

fitting of being able to connect the modular bit in the lateral to the riser system. It was an easier way of doing that. It presented less problems.
SIR MARTIN MOORE—BICK: Thank you.
MS GRANGE: We saw earlier that there was a specification in the design for two—hour fire rated boards for the boxing—in.
If we can go to your first statement at page 13 {MET00012711/13}, that's your Met statement, here you have helpfully set out a table of all the materials that were used, and at the very bottom row on this page we can see it says:
"Boxing in of pipework.
"Enviroboard Fire Board — Uni Board 12mm."
That's the fire boxing material, and then you've got:
"88 minutes. Manufacturer's specification is up to 2 hours."
Now, just to be clear, was that the product used for the boxing in of the risers at Grenfell Tower?
A. It was, yes.
Q. Yes.
If we go to the technical datasheet for these Enviroboards, that's at {TRI000001377}, this is specifically for this Uni—Board version of the

Enviroboards.
If we go to page 2 {TRI000001377/2}, there is a table at the top with British and European test results, and if we look at the fifth row down for BS 476—22, which are the relevant tests, we can see the 12—millimetre board achieved 65 minutes insulation and 88 minutes integrity. Do you have that?
A. I do, yes.
Q. Then at the bottom of the first page {TRI000001377/1}, there is a table, and it says:
"Technical DATA 12mm Up to 2 Hour Rated Fireboard."
Do you see that there?
A. Yes.
Q. Now, saying it's an up to two—hour fire rated fire board isn't the same as saying that this board has a fire resistance of two hours, is it?
A. That's correct.
Q. And the board only had 88 minutes of fire resistance integrity, didn't it?
A. It did, yes.
Q. So the board that was used did not follow the specification in terms of fire resistance; is that correct?
A. Yeah, it wouldn't have been compliant with the requirements of two hours.

Q. Can you account for that error in terms of what was installed?
A. It was —— I think there was confusion around up to two hours, providing two—hour fire rating, and subsequent to that we now understand it was 88 minutes. So that is an error in terms of understanding the specification of the material that was used against the requirement.
Q. Can you account for how that error occurred?
A. I can't.
Q. Now, repositioned meters.
As we discussed earlier, the new design required the gas meters within the flats to be moved from the cupboard in the kitchen to be located closer to the front door.
Now, that location is also the position of the sole means of escape from the flats, isn't it?
A. The designers deemed the room next to the sole means of escape to be a separate room, or a separate cupboard, and therefore it wasn't on the sole means of escape. So their understanding at the time of the term sole means of escape was the hallway itself.
Q. Right, I see.
A. And the relocation of the meters, to enable us to comply with the 2—metre rule, in terms of putting it in that

location, was the room next to the sole means of escape.
Q. I see. Do you maintain that that was a correct interpretation of IGEM/G/5?
A. At the time, that's the interpretation of it. I don't ... I think you can look at it either way. So, you know, if you're taking a less risk —— risk is not the right —— if you're taking a view that actually it's connected to the sole means of escape, then it could be deemed to be on the sole means of escape, but that wasn't how it was understood when the designers were discussing the location of that meter location and where it could go.
SIR MARTIN MOORE—BICK: Ms Grange, I'm going to interrupt you for a moment.
Is it time we had a break? I think we should do that, then, whatever.
I'm sorry, I should have asked the stenographer when I asked you, Mr Dolan, but I'm afraid I didn't, and it's time we gave her a break.
So I think we'll have a break at this point, Ms Grange.
MS GRANGE: Yes, that's fine, absolutely fine.
SIR MARTIN MOORE—BICK: So we will come back at 3.35, please, and then we'll carry on there.
THE WITNESS: Okay.

SIR MARTIN MOORE—BICK: All right? And please don't talk to anyone about your evidence while you're away from the room.
THE WITNESS: No.
SIR MARTIN MOORE—BICK: Good, thank you very much.
(Pause)
3.35, please.
MS GRANGE: Thank you.
(3.20 pm)
(A short break)
(3.35 pm)
SIR MARTIN MOORE—BICK: All right, Mr Dolan, ready to carry on?
THE WITNESS: Yes.
SIR MARTIN MOORE—BICK: Good, thank you very much.
Yes, Ms Grange.
MS GRANGE: Yes, thank you.
Yes, before we broke off we were discussing the location of the meter in the flats, and the fact that the meter position had to be moved to nearer the front doors because of the new riser replacement programme.
Can we just look at IGEM/G/5, second edition, on this. That's at {RHX00000005/38}.
If we go to 5.2.3 at the bottom of the page, we can see it says:

"Siting meters with respect to sole escape routes within individual dwellings."

Then below that, 5.2.3.1, it says:

"If it is proposed to install a meter in a sole means of escape within an individual dwelling, either:

"▪ the meter shall be enclosed in a box, cupboard or other compartment (which may open onto the sole means of escape from within the individual dwelling) which is at least 30 minute fire resistant to BS 476 and which has a self-closing door, or

"▪ the pipe immediately upstream of the meter installation, shall be provided with a TCO."

Can you just help us, what is a TCO?

A. That's a thermal cut-off valve.

Q. Can you just explain what the function of that is?

A. Yes. It will automatically close when the temperature in that location gets to a certain level.

Q. Right, yes.

As we understand it, it was permissible by this technical standard to put the meters in a sole means of escape, provided they are either in this fire rated cupboard, at least 30 minutes fire resistant, self-closing door, or the pipe has to have this thermal cut-off device fitted; is that how you understand that part of IGEM/G/5 guidance to work?

A. It is, yes.

Q. Does it follow from the answers you gave before we broke off that tRIIO did not consider this part of IGEM/G/5 to be engaged for the Grenfell Tower project because these meters were not being installed in the sole means of escape but just close to the sole means of escape?

A. That's correct, a room that connected to the sole means of escape.

Q. Right. So did tRIIO actually consider this point, consider whether this provision applied, and reject that, or are you making an assumption that that must have happened?

A. No, we did consider it and it was rejected.

Q. Right.

Now, it doesn't appear that any TCOs, thermal cut-off devices, were installed for these repositioned meters; is that correct?

A. That's correct.

Q. Nor were there any self-closing doors on the meter cupboards; is that correct?

A. That's correct.

Q. Nor is there any evidence of the cupboards having at least 30 minutes' fire resistance; is that correct?

A. That's correct.

Q. Is the explanation for that simply that you didn't think this applied?

A. We didn't consider it to be a box cover or a compartment, it was considered to be a room connected to the sole means of escape.

Q. So you mean that the cupboard into which the meter went, you thought that was a room connected to the sole means of escape?

A. It was -- yeah, the designer's determination was that it didn't fall into this requirement.

Q. Right.

Let's just have a look at an image at {MET00016651}. This is an image taken by the Metropolitan Police of flat 22, which is on floor 5. Here we can see the meter in this alcove. Do you see that?

A. Yes.

Q. I think we can agree that's not a self-closing cupboard, is it?

A. No, it's not a self-closing cupboard.

Q. And, by definition, not 30 minutes fire resistant.

A. In terms of the designer's determination is that was considered a room.

Q. Right. I see.

I want to ask you briefly now about valves, and starting with pipeline isolation valves, PIVs.

We heard yesterday from Mr Harrison that Cadent

believed that a pipeline isolation valve, a PIV, was installed in the ground on the east side of Grenfell Tower in the gas pipes supplying residential supply 2. Is that something that you can confirm?

A. That's correct, yes.

Q. So a PIV was put in there?

A. A PIV was installed, yes.

Q. Now inlet isolation valves.

When the service pipe for residential supply 2 comes into the basement, it enters at height, around 4 to 5 metres from the floor; is that correct?

A. It is, yes.

Q. And it travels along the ceiling until it comes up through the building. We've seen that in the photographs.

We don't have any design from tRIIO about how the pipe layout and installation in the basement should have been designed. All we've seen is the photographs marked up by Simon Boygle which I showed you earlier.

Are you aware of anything else that tRIIO did in terms of that design?

A. I'm not.

Q. No.

Would tRIIO typically produce a detailed design of the pipe layout in the basement?

A. Not ... in terms of —— no, not that I'm aware of.
Q. Was it just left up to the installers to put in the service pipe in the basement in whatever way they saw fit?
A. It would have been a —— yeah, an interactive process where the designers were talking to the pre—construction team, were talking to the subcontractors, so there would have been constant dialogue and agreement, and it was an iterative process in terms of the survey being undertaken into design, a design produced, a design drawing, which was the GASWorks9 drawing, as you can see, and then there would have been dialogue, there would have been a project pack created, and the details of the route of the pipeline within the basement and throughout the rest of the building would have been part of that process.

But I'm not aware of a specific detailed design drawing that was available to —— that covered that route.

Q. Yes, I see. I think from that answer what you're saying is it would have been determined on site in dialogue with the subcontractor and tRIIO?
A. Yes.
Q. Now, we know that a valve was installed in the pipeline of residential supply 2 once it came into the basement.

That was called an inlet isolation valve, an IIV. Is that correct?
A. That's correct, yes.
Q. Now, this was installed at height, but there was no ladder installed in the basement to get to it. Do you agree?
A. That's correct, yes.
Q. Would tRIIO typically plan to install a ladder so that that valve could be reached?
A. No.
Q. Can you help as to why tRIIO wouldn't install a ladder in this position? What I mean by that is not just a ladder on the ground that someone can pick up, but actually a ladder that's welded into the side of the basement to be able to access that IIV.
A. Yes, I can. The reason for that valve is it's a planned —— it's to be used in a planned situation.
Q. Yes.
A. So any inspection of that valve or use of that valve would not have been for an emergency requirement, it would have been for a planned operation, whether that is, for example, a six—monthly inspection of the valve, and under those circumstances, a bespoke temporary works design would have been produced to enable the operative to be able to get up and do the inspection.

The reason for not installing a ladder is (a) it's open to other people to use. It would need to be inspected on a regular basis to maintain its integrity, and therefore the decision was taken that it's better and safer to do it in the way I just described as opposed to putting something there that people could access and the issues around inspection and maintenance.

So it was never the intention to put something there for constant use because it was a planned frequent —— a frequency around when it would be used.

Q. Right, I understand, thank you.

Can we go again to IGEM/G/5, {RHX00000005/43}.

At the bottom of the page, paragraph 6.1.17, this says:

"Consideration shall be given to the provision of a line diagram at each building entry/IIV, depicting the dwellings served by that particular network pipeline."

Now, is it your understanding that it's good practice to provide a line drawing at the IIV point?

A. My understanding of that is around the diagram from or the drawing from the pipeline into the PIV into the building which would show the IIV. I'm not aware of any other line diagrams being produced showing internal pipework and the associated valves.
Q. Right, okay.

Now, just stepping back for a moment, we have been through a lot of different aspects of the design and the construction today, and looking at matters in the round, can we agree that, overall, the design work that tRIIO undertook at Grenfell Tower did not contain sufficient detail about the following things:

It didn't contain sufficient detail about how the ventilation would be achieved in all the laterals along the whole height of the riser.

A. Yes.
Q. It made no provision for ventilation through the floors once the riser boxing—in was completed.
A. I don't agree with that.
Q. How about it made inadequate provision for ventilation through the floors once the riser boxing—in was completed?
A. The ventilation wasn't supported by calculations, I think is the ...
Q. Can we agree there wasn't any detail in the design on how natural ventilation would be achieved in the basement or at the top of the building?
A. That's correct, yes.
Q. And can we also agree that the designer does not appear to have approached any Building Regulation or fire expert with regards to understanding or mitigating the

impact of breaching the compartment through the stair walls?
A. Yes.
Q. Now, in those circumstances, would you accept that tRIIO's design work lacked thoroughness?
A. I think there were elements of it that could have been improved or should have been improved, yes.
Q. Do you agree that tRIIO should have taken more active steps to assure itself that its contractors and subcontractors were coming up with a safe and compliant design?
A. Its contractors producing a design or tRIIO producing its design? Can you just clarify that for me, please?
Q. Let's say tRIIO producing the design.
A. Yes, we -- again, you know, in terms of what was produced and what was shared with the supply chain, the contractors, there was definitely improvements to be made in terms of that information.
Q. Yes.
When we spoke about this earlier, you said that there was an audit regime for the design in place and there were three tiers of audits that were undertaken on all the works that were delivered.
Can you explain how that audit regime didn't pick up the design problems that we've just been identifying?

A. So the audit is not around the design. There is an inspection regime on the operational activities undertaken. So our site manager would have had a requirement to do a number of inspections on site. We would have expected our contractors and subcontractors to undertake their own inspections of their work. We had the client undertaking assurance checks on site, and also our health and safety team would have gone to site and undertaken --
Q. I see.
A. -- inspections.
In terms of -- in reference to the introduction of the non-compliant flanges, that should have and was not picked up by our site manager. It was subsequently picked up by the client audit, Pat Kelly's audit, and that was communicated to Steve Johnson and then that was addressed, as you've seen earlier on, around the design amendment and the change in design in terms of the boxing-in and around ventilation.
Q. Yes, I see.
In terms of the construction work, can we agree that tRIIO's contractors and subcontractors failed to install the welded joints and put in flange joints instead?
A. Yes.
Q. Failed to install boxing-in with two-hour fire rated

materials?
A. Yes.
Q. And failed to install temporary firestopping in the oversized holes between the stair and the lobby, thereby increasing the risks from fire while the work was incomplete?
A. It wasn't installed, yes.
Q. Do you accept that tRIIO could have exercised much better control over its own staff and its subcontractors to make sure they produced safe and compliant work?
A. Yes, I think the sequencing of works could have been different, whereby the non-compliant elements of the work could have been avoided.
Q. Yes.
Now, just one final topic, just to return to something about the consultation process that was done over this riser.
We talked before about the decision to place it in the stair and the options that were considered for that, and you talked about it being a tripartite discussion between Cadent, tRIIO and the TMO.
Now, during those tripartite discussions concerning those options, was the need to consult residents ever raised by tRIIO or anyone else?
A. So the residents were informed via letters in terms of

the works that were going to be undertaken on the reactive programme, and subsequent to that, at a later date, there were letters issued for the proactive works that were subsequently suspended.
Q. Yes, I appreciate they might have been informed by letter about the works that were going to be undertaken once that decision was made, but were they consulted over the available options in terms of where to put the riser in the first place?
A. Not that I'm aware of, no.
Q. Did tRIIO ever raise that as something that ought to happen?
A. No.
Q. So far as you're aware, was there in fact ever any resident consultation over those different options?
A. I'm not aware of that happening.
Q. We looked at the email from Mr Chapman about his concerns; did tRIIO ever communicate directly with residents about their fire safety concerns in terms of the riser replacement work?
A. Not that I'm aware of, no.
MS GRANGE: Thank you.
Mr Chairman, I've come to the end now of my pre-prepared questions.
SIR MARTIN MOORE-BICK: Right.

MS GRANGE: If we could perhaps have a ten-minute break, I think that would be sufficient for questions.
SIR MARTIN MOORE-BICK: Or thereabouts, yes.
Well, Mr Dolan, as I indicated earlier, when counsel gets to the end of her questions, we have to have a short break to enable her to check that nothing's been left out, and also to let other people who aren't physically present suggest questions which perhaps we should be putting to you.
THE WITNESS: Yes.
SIR MARTIN MOORE-BICK: So we'll have a break now. We'll come back at, I think, 4.05.
MS GRANGE: Thank you.
SIR MARTIN MOORE-BICK: And at that point we'll find out if there are any more questions for you. All right?
THE WITNESS: Okay.
SIR MARTIN MOORE-BICK: Again, please don't talk to anyone about your evidence while you're out of the room. If you would like to go with the usher, she'll look after you, and we will see you in a moment.
(Pause)
4.05, then, please.
MS GRANGE: Thanks.
(3.52 pm)
(A short break)

(4.05 pm)
SIR MARTIN MOORE-BICK: Right, Mr Dolan. Well, we'll see if there are any more questions for you.
Yes, Ms Grange?
MS GRANGE: No, there are no further questions, Mr Chairman. I would just like to thank Mr Dolan for coming here today and assisting us with our investigations. It really is appreciated.
THE WITNESS: Thank you.
SIR MARTIN MOORE-BICK: Yes, and I would like to thank you very much, Mr Dolan, on behalf of all three members of the panel. It's always very helpful and indeed very interesting for us to hear from people who were actually involved and had first-hand knowledge of what was going on.
I would really like to say as well how grateful we are for your candour in describing the events and responding to the questions that we put to you. It's been extremely useful and we are very grateful.
THE WITNESS: Thank you.
SIR MARTIN MOORE-BICK: So thank you very much, and now you are free to go.
THE WITNESS: Okay. Thank you.
SIR MARTIN MOORE-BICK: Thank you very much.
(The witness withdrew)

SIR MARTIN MOORE-BICK: Yes, Ms Grange, now then.
MS GRANGE: Yes, thank you. So we have nothing further for today, and tomorrow we will be hearing from our gas expert, Mr Hancox.
SIR MARTIN MOORE-BICK: Yes, good, thank you very much.
Well, in that case, we'll break there for today and we'll resume tomorrow morning at 10 o'clock.
MS GRANGE: Thank you.
SIR MARTIN MOORE-BICK: Good, thank you very much.
10 o'clock tomorrow, then.
(4.07 pm)
(The hearing adjourned until 10 am on Wednesday, 14 July 2021)

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