



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.

1

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?

2

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.

3

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?

4

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

5

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

6

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

7

1 Q. Yes. Thank you.
 2 Now, just going back again to your first statement,
 3 this time one page on on page 3 {MET00012711/3}, if we
 4 look at paragraph 11, you tell us here:
 5 "At any one point in time, tRIIO has approximately
 6 500 projects ongoing, of which around 20 to 30 can be
 7 MOBs [multi—occupancy buildings] projects. I am one of
 8 two of tRIIO's Contract Directors responsible for the
 9 delivery of the overall programme of works, with part of
 10 my area of responsibility relating to the design and
 11 construction of the MOBs projects for both the London
 12 and East of England Networks."
 13 Now, just to clarify, at the date you made that
 14 statement, you were still a contract director at
 15 tRIIO —
 16 A. I was.
 17 Q. — is that correct? And that was your role at the time
 18 of the works at Grenfell Tower; is that correct?
 19 A. It was.
 20 Q. Yes.
 21 You tell us there that there were two contract
 22 directors. Can you just help, how was the role divided
 23 up? Did you have different areas of responsibility?
 24 A. Yeah, so my area of responsibility, I looked after
 25 operations for the London network, and I had design,

8

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

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

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

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

15 A. So at any one point, as in my statement, around 20 to
 16 30, predominantly in the London network. In fact, the
 17 vast majority of the MOB's projects were in the London
 18 network.

19 Q. Yes.

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

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

9

1 that would have been discharged through my team.

2 Q. Yes.

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

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

9 Q. Yes.

10 A. So they were direct reports of mine.

11 Q. Yes.

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

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

19 Q. Yes, thank you.

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

22 A. Yes. I started in the gas industry in 1988 and spent
 23 25 years working for British Gas, Transco and
 24 National Grid, before joining the tRiIO contract in
 25 2013.

10

1 Q. Yes, thank you.

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

4 A. I did, yeah.

5 Q. Yes. When did you commence that training?

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

11 Q. Yes, thank you.

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

14 A. Yes, it is, yeah.

15 Q. Was that a senior role within National Grid?

16 A. Yes, it was a senior management role.

17 Q. Yes, thank you.

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

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

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

23 A. I am, yes.

24 Q. Yes.

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

11

1 the relationship between tRiIO and Cadent.

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

6 Now, is it right that the contract with tRiIO was
 7 designed to assist Cadent in fulfilling those
 8 obligations?

9 A. Yes.

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

12 A. Yes.

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

16 A. That's correct, yes.

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

20 A. Yeah. Yes.

21 Q. Yes.

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

12

1 that correct?

2 A. Yeah, there'll be a hierarchy of documentation,

3 specifications that we would refer to.

4 Q. Yes.

5 Mr Stephen Mason of Cadent has provided several

6 witness statements to the Metropolitan Police and to

7 the Inquiry. He was the operations director for Cadent.

8 I just want to look at something he says in one of

9 his statements, if we can bring that up at

10 {CAD00003005/3}, and I want to look at paragraph 11.

11 He says:

12 "This Contract [that's the one between Cadent and

13 tRiIO] underpins the relationship between Cadent and

14 tRiIO and sets out the contractual relationship for this

15 8 year period. tRiIO, as contractor for works under the

16 Contract is required to comply with all statutory

17 requirements (including CDM Regulations (as defined in

18 paragraph 16 below) and any obligations imposed by the

19 Health and Safety Executive or Ofgem), relevant British

20 or European standards or codes of practice, and best

21 practice guidelines in respect of health and safety as

22 are applicable to the activities carried out under the

23 Contract."

24 Now, do you agree with what Mr Mason says there in

25 terms of —

13

1 A. Yes.

2 Q. Yes, thank you.

3 Just to be clear, the best practice guidelines that

4 he's referring to around five lines down — he says,

5 "best practice guidelines in respect of health and

6 safety" — would, for example, the publication IGEM/G/5

7 be classified as good practice guidance?

8 A. Yes.

9 Q. If we go over the page in his statement to page 4

10 {CAD00003005/4} and look at paragraph 12, he says at the

11 beginning there:

12 "As part of the contract, tRiIO is required to work

13 in accordance with a number of Cadent's policies,

14 procedures and industry standards which includes

15 IGEM/G/5."

16 You tell us in your second witness statement —

17 I don't think we need to turn it up — at page 6

18 {TRI00001797/6}, paragraph 23, that tRiIO applied the

19 IGEM/G/5 standard when designing and constructing the

20 gas supply replacement works; is that right?

21 A. That's correct.

22 Q. You also tell us that this summarises best practice and

23 guidance from legislation and existing gas industry

24 standards and procedures for gas installations in

25 multi-occupancy buildings; is that correct?

14

1 A. Yes.

2 Q. Yes.

3 Just help us, I think we heard yesterday, but IGEM,

4 for those listening, is the Institution of Gas Engineers

5 and Managers?

6 A. That's correct.

7 Q. Is it right that IGEM issues technical standards for the

8 gas engineering industry?

9 A. Yes.

10 Q. We can see IGEM/G/5 — it's an exhibit to Mr Hancox's

11 report, he is the Inquiry's gas expert — at

12 {RHX00000005}.

13 We can see that this is the second edition of

14 IGEM/G/5, "Gas in multi-occupancy buildings". This

15 version was issued in 2012 and was the current issue at

16 the time of the gas replacement works at Grenfell Tower.

17 Is that your understanding?

18 A. Yes.

19 Q. Yes, thank you.

20 I think you agree, but just to confirm, you agree

21 that tRiIO was required to work to this standard and

22 meet the technical requirements that it set out?

23 A. That's correct.

24 Q. Would you have expected the tRiIO design team to have

25 been familiar with it?

15

1 A. Yes.

2 Q. Now, under the Building Regulations regime, there was

3 also practical guidance in the form of a number of

4 approved documents, including something called Approved

5 Document B on fire safety.

6 Were you familiar with that document at the time you

7 were responsible for the Grenfell Tower design works?

8 A. I was familiar with the Building Regulations but not

9 specifically the Approved Document B that you reference.

10 Q. Yes. Would you expect that those at tRiIO who were

11 designing the works, the replacement riser works, would

12 have been familiar with Approved Document B insofar as

13 it has sections relevant to gas works?

14 A. I would have expected the design team to be familiar

15 with the document. I'm not sure I can answer whether or

16 not they would have been specifically — understood that

17 particular section.

18 Q. Yes.

19 A. They would have recognised the Building Regulation, but

20 maybe not the fire safety order section that you

21 referenced.

22 Q. Right. Yes.

23 Let's just pull up Approved Document B. It's at

24 {CLG00000224}.

25 There it is. It's quite a long document. It

16

1 contains a lot of practical guidance.
 2 Just to be absolutely clear about your answer, you
 3 would have expected the tRIIO designers to have been
 4 familiar and aware of this document; yes?
 5 A. They would have been aware of the Building Regulations
 6 document, yes.
 7 Q. When you say "aware of the Building Regulations
 8 document", do you mean this practical guidance or do you
 9 mean the Building Regulations themselves?
 10 A. Building Regulations themselves.
 11 Q. Right.
 12 A. Yeah.
 13 Q. So they will have been aware of the functional
 14 requirements in the Building Regulations?
 15 A. Yes.
 16 Q. Yes, but not necessarily familiar with this detailed
 17 practical guidance?
 18 A. That's correct.
 19 Q. Yes.
 20 Is it right that, in 2016 and 2017, a gas engineer
 21 would have referred primarily to the IGEM standards in
 22 terms of health and safety?
 23 A. Yes.
 24 Q. Would that be the only guidance document that a gas
 25 engineer would have referred to in their work, or would

17

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

18

1 A. I do, yes.
 2 Q. Yes, what were those?
 3 A. Principal designer.
 4 Q. Yes.
 5 A. Designer.
 6 Q. Yes.
 7 A. And principal contractor.
 8 Q. Yes, so all three distinct roles --
 9 A. Yes.
 10 Q. -- tRIIO held those; is that correct?
 11 A. We did, yes.
 12 Q. Yes.
 13 Now, we know that the role of principal designer was
 14 a new role created in the 2015 regulations, that had not
 15 existed previously.
 16 Can you help us, what training did tRIIO undertake
 17 to take on this new role when the new regulations came
 18 in?
 19 A. Cadent approached us when the new duty holder role came
 20 into place to take on that role. We engaged the
 21 services of an external consultant, namely Arup. Arup
 22 came in and reviewed our business processes, our health
 23 and safety documentation, our capability, and they
 24 produced what in effect was a gap analysis report, which
 25 identified those parts that we currently complied with

19

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

20

1 "As Principal Designer, tRiIO had responsibility to
 2 plan, manage, monitor and coordinate health and safety
 3 during the pre—construction phase and to liaise with the
 4 Principal Contractor during the delivery of the
 5 construction work."
 6 Now, as principal designer, would you accept that
 7 tRiIO had a duty to assess the health and safety risks
 8 throughout the lifecycle of the whole project?
 9 A. Yes.
 10 Q. So not just at the beginning, not just at the end, but
 11 actually throughout the works itself?
 12 A. Throughout the works and post—completion, for any
 13 inspection and maintenance that would be needed for the
 14 pipeline once commissioned.
 15 Q. Yes.
 16 Can we agree that the principal designer has other
 17 duties, such as assisting the client with preparing
 18 pre—construction information?
 19 A. That's right, yeah.
 20 Q. Monitoring the construction phase, co—ordinating health
 21 and safety matters during construction?
 22 A. Yes.
 23 Q. And identifying, eliminating or controlling foreseeable
 24 risks?
 25 A. Yes.

21

1 Q. Thank you.
 2 At the end of a project like this one, where more
 3 than one contractor was involved, the principal designer
 4 prepares the health and safety file and passes that
 5 completed file to the client; is that your
 6 understanding?
 7 A. That is correct.
 8 Q. Now, as you've mentioned, tRiIO was also a designer for
 9 the purposes of the CDM Regulations.
 10 If we look again at your first statement, now at
 11 paragraph 21, same page {MET00012711/4}, you tell us
 12 that:
 13 "As Designer, tRiIO's role was to prepare and modify
 14 the design in relation to the in ground works and riser
 15 pipework at the Tower. In performing that role, tRiIO's
 16 designers took account of pre—construction information
 17 provided by Cadent to try to eliminate foreseeable risks
 18 to the health and safety of those working on the
 19 project, the residents and others affected by the works.
 20 In circumstances where the risks could not be
 21 eliminated, tRiIO's designers took steps to reduce and
 22 control those risks. The design was then shared with
 23 the construction team and others working for tRiIO."
 24 So we know that the roles of principal designer and
 25 then designer, they're separate roles under the CDM

22

1 regime, aren't they?
 2 A. Yes, they are.
 3 Q. And the role of CDM designer is also distinct from any
 4 design role, in the sense of having a contractual
 5 obligation to design; is that correct?
 6 A. It is.
 7 Q. For the Grenfell project, tRiIO was both CDM designer as
 8 well as having the primary contractual role in designing
 9 the works under the contract with Cadent; yes?
 10 A. That's correct.
 11 Q. Looking again at your first statement, now paragraph 22
 12 {MET00012711/4}, you tell us there that:
 13 "As Principal Contractor [this time], tRiIO had
 14 responsibility to plan, manage, monitor and coordinate
 15 the entire construction phase of the reactive and
 16 proactive works."
 17 Is that correct?
 18 A. Yes.
 19 Q. Yes, thank you.
 20 Now, moving on to consider the gas installations at
 21 Grenfell Tower itself.
 22 We asked Mr Harrison about the three different gas
 23 supplies into the tower yesterday, but I just want to
 24 confirm your understanding of those.
 25 If we go to {RHX00000012/14}, this is a figure,

23

1 figure 4, from Mr Hancox's expert report, and it shows
 2 the three different gas supplies into the tower.
 3 At the bottom, we see in purple the landlord supply,
 4 which we understand feeds the boilers. Now, it's right
 5 that tRiIO had nothing to do with that gas supply, did
 6 it?
 7 A. That's correct.
 8 Q. Yes.
 9 Then we can see in red at the top on the right—hand
 10 side, residential supply 1. Now, this was the original
 11 gas supply to the flats installed when Grenfell Tower
 12 was built; is that correct?
 13 A. Yes.
 14 Q. And we can see, if we follow the red line, that it comes
 15 into the basement and then divides into four, four
 16 risers, one for each of the four corners of the
 17 building. Do you see that?
 18 A. I do.
 19 Q. Again, was that your understanding at the time?
 20 A. Yes.
 21 Q. Yes.
 22 As it goes up, two of those risers split into two,
 23 so there are in fact six pipes going up, one into each
 24 of the six flats on each floor; is that correct?
 25 A. That is correct.

24

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

25

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

26

1 A. None at all.
 2 Q. No. And that was done by an emergency Cadent team,
 3 wasn't it?
 4 A. Yes.
 5 Q. Yes.
 6 A. Yeah.
 7 Q. Now, you mentioned earlier that you would get a request
 8 pro forma. I want to look at that now in the context of
 9 discussing what information was provided to tRIIO about
 10 this project.
 11 If we can go to {CAD00000019}, this is an email from
 12 someone called Danny Large. We can see at the bottom of
 13 the page that he worked for National Grid, then became
 14 Cadent. The email is dated 3 October 2016. If we look
 15 at the email addresses, we can see it's sent to a number
 16 of people, including tRIIO personnel.
 17 There is an attachment. He says, "Please see
 18 disconnected MOB". We'll go to that in a moment.
 19 In the red text of the email, he says:
 20 "tRIIO have met with [National Grid] onsite to
 21 confirm project scope."
 22 Do you see that?
 23 A. I do.
 24 Q. Now, do we understand correctly from this that by
 25 3 October 2016, the time this email was sent, tRIIO had

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

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

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

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1 Regulation 4(4)."
 2 Below that, we can see the date that this part of
 3 the form was completed; it was 1 October, we've got that
 4 there in the yellow box, and the time of cut-off was
 5 2 am in the morning.
 6 Midway down the page, we can see on the left--hand
 7 side there's a heading "Supply Material". We can see
 8 some details of the service pipes that were affected,
 9 said to be steel pipes, diameter of 4 inches, the riser
 10 material is steel, it's an internal riser location,
 11 et cetera. So we can see that there.
 12 Beneath that, we see some details about the
 13 building. It says:
 14 "Height of Building: [in excess of] 40 [metres].
 15 "Category of job: High Rise.
 16 "Number of Floors: 23.
 17 "Number of Properties affected: 38."
 18 Then beneath that, we see the flat numbers of the
 19 customers that were believed at that time to be
 20 affected. I think Mr Harrison accepted yesterday that
 21 some of this may be inaccurate because some of these
 22 flats seem to end in a 1, not a 2, and it was only those
 23 ending in 2 that had had their gas cut off. Is that
 24 right?
 25 A. That's right, yeah.

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

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

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

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

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

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

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1 the access into the property.
 2 Q. Yes. But in practice, on the ground, how would you
 3 actually be sharing that information amongst the
 4 surveyor, the design team, all the operatives that were
 5 on site?
 6 A. Yes, so when the client brief is issued to us in tRiIO,
 7 we then commence the creation of what we call the health
 8 and safety file , and that's in our — or it would have
 9 been in our electronic system. We had a database,
 10 a repository, called Nexus, whereby we would start to
 11 collect information.
 12 We were issued with an engineering bulletin from the
 13 client with regards to what the content of the health
 14 and safety should include, and the hierarchy of folders
 15 within the electronic system would represent the
 16 requirements of the health and safety file required by
 17 the client , and also what information we would need to
 18 use to inform the design and the construction.
 19 So it was an iterative process —
 20 Q. Yes.
 21 A. — in terms of building that information, and the full
 22 team would have had access to Nexus, it was on the web.
 23 Q. Yes.
 24 A. So that's how the information would have been shared,
 25 and by electronic forms, emails, and teleconferences,

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1 et cetera .
 2 Q. Yes. Just to be clear , that health and safety file , is
 3 that the same as a health and safety file for CDM
 4 purposes?
 5 A. It is , it is the CDM health and safety file, yes.
 6 Q. Yes. And would it be shared — we'll come on in
 7 a moment, just a moment actually, to look at all the
 8 different contractors and subcontractors beyond tRiIO,
 9 underneath tRiIO, who were assisting with this work.
 10 Would they also have access to the health and safety
 11 file ?
 12 A. Not necessarily , no. They would get that information
 13 through an operational handover.
 14 Q. Right.
 15 Looking back, do you think they perhaps ought to
 16 have had access to the information in the health and
 17 safety file ?
 18 A. That would have — yes, would have improved the process.
 19 Q. Yes, thank you.
 20 So in your first witness statement, you have
 21 helpfully set out a list of contractors and
 22 subcontractors who worked on the riser replacement at
 23 Grenfell Tower. I just want to run through a few of
 24 them.
 25 If we go to your first statement, your Met

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

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1 a subcontractor to K&S; yes?
 2 A. Yes.
 3 Q. And they were there as a surveyor; is that correct?
 4 A. Yeah, so —
 5 Q. As a sole trader, and that was someone called
 6 Simon Boygle?
 7 A. Yes.
 8 Q. Is that correct?
 9 A. That's correct.
 10 Q. Yes, sorry, you were about to say something about —
 11 A. No, I was jumping ahead there, sorry.
 12 Q. No, no, it's fine.
 13 What was Mr Boygle subcontracted by K&S to do?
 14 A. Simon was subcontracted — he was the surveyor, so Simon
 15 visited the property and he produced the survey, which
 16 was then provided to the design team to enable the
 17 design to proceed.
 18 Q. Yes.
 19 Although Mr Boygle was a subcontractor to K&S, did
 20 tRiIO have direct dealings with him on this project?
 21 A. Not contractually. That was dealt with through K&S.
 22 But on a day-to-day basis, he would have been in
 23 constant dialogue with the design and pre-construction
 24 team.
 25 Q. Right, thank you.

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

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

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1 enable the route of the pipe to be installed.
 2 Q. Yes. Did they ever move any of the light wells in the
 3 stairs, do you remember, as well?
 4 A. I don't remember.
 5 Q. Right.
 6 A. There may have been a temporary requirement, but I'm not
 7 100% sure on that.
 8 Q. You tell us in your witness statement that these
 9 contractors were on your approved contractors register.
 10 Can you just help us, what is that register?
 11 A. Yeah, before we engage the services of any contractor,
 12 they need to fulfil certain criteria. That is known as
 13 a pre-qualification questionnaire. That is filled in
 14 and that's then reviewed and it satisfies that they are
 15 a company that we want to engage with, both from
 16 a financial viability perspective, but also from
 17 a health and safety capability.
 18 Q. Yes. What checks would be carried out to satisfy tRiIO
 19 that, from a health and safety capability perspective,
 20 this was an appropriate subcontractor to be dealing
 21 with?
 22 A. So, for example, if they would have had a health and
 23 safety management system which laid out the arrangements
 24 that that company would undertake to satisfy their legal
 25 obligations from a health and safety perspective.

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

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

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

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1 carried out?
2 A. That was an ongoing process. So as soon as work
3 commenced, there would have been inspections undertaken.
4 It would have been recorded on, for example, our mobile
5 platform system, and that information would have then
6 been made available to the management team in the form
7 of management information and action taken if
8 non-conformances were identified.
9 Q. Yes.
10 Now, turning more specifically to the work that
11 tRiIO did at Grenfell Tower, is it right that tRiIO's
12 work was intended to be in two phases: first, to
13 reinstate the gas service to the riser that was cut off
14 after the gas leak, that's the flat 2 work; yes?
15 A. Yes.
16 Q. And, second, to use that design, that new riser, to
17 eventually supply all the flats through that new riser;
18 is that right?
19 A. Yes.
20 Q. Yes.
21 Is it right that you would call the first of that
22 work, the first replacement riser to the flat 2s,
23 reactive works? Is that right?
24 A. Yes.
25 Q. And that's reactive to a cut in supply; yes?

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

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

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

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

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

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

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

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

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

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

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

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1 the route that was taken.
 2 MS GRANGE: Yes.
 3 Mr Chairman, I was just going to quickly run through
 4 a couple of other options, but equally I can stop there,
 5 because they're slightly discrete little topics.
 6 SIR MARTIN MOORE-BICK: What would you prefer to do?
 7 MS GRANGE: Let's stop now. I'm making good progress and
 8 I'll carry on with the other options when we pick up
 9 after the break.
 10 SIR MARTIN MOORE-BICK: Right. Thank you.
 11 Well, Mr Dolan, as I think we warned you, we have
 12 a break during each session. This seems to be a good
 13 time to take a break now. So we'll stop and resume at
 14 11.30.
 15 I have to ask you, please, not to talk to anyone
 16 about your evidence or anything relating to it during
 17 the break. All right?
 18 THE WITNESS: Yes.
 19 SIR MARTIN MOORE-BICK: Thank you very much. Would you like
 20 to go with the usher, please.
 21 (Pause)
 22 Thank you. 11.30, then.
 23 MS GRANGE: Thank you.
 24 SIR MARTIN MOORE-BICK: Thank you.
 25 (11.15 am)

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1 (A short break)
 2 (11.30 am)
 3 SIR MARTIN MOORE–BICK: All right, Mr Dolan, ready to carry
 4 on?
 5 THE WITNESS: Yes.
 6 SIR MARTIN MOORE–BICK: Thank you very much.
 7 Yes, Ms Grange.
 8 MS GRANGE: Yes, thank you.
 9 Yes, we were in the middle of discussing the
 10 different options for the replacement riser and how it
 11 came about that that riser ended up in the stairs, and
 12 we've already just discussed the fact that there was
 13 a proposal to put it on the outside of the building, but
 14 you explained that that was not satisfactory for the TMO
 15 and so you had to look inside the building for the
 16 riser; is that correct?
 17 A. That's correct, yes.
 18 Q. Yes.
 19 I now want to discuss the option of running it
 20 through residential supply 1, so running it through the
 21 existing position of the riser that had been cut off.
 22 Now, as we understand it — is this right? — the
 23 existing gas supply ran from the basement, up through
 24 the building and into the flats at the kitchens, so it
 25 was actually going internal to the flats —

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

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1 really for two reasons: (1) because it was going up
 2 between people's flats, so there was the problem of
 3 access; and (2) because it was going between concrete
 4 floors —
 5 A. Yes —
 6 Q. — through concrete floors —
 7 A. Yes, embedded —
 8 Q. — which made inspection difficult? Is that a fair
 9 summary of the problems?
 10 A. It is, yes.
 11 MS GRANGE: It is, thank you.
 12 SIR MARTIN MOORE–BICK: I think you ought just to explain
 13 what you were trying to say. It's embedded in the ...?
 14 A. The fabric of the building.
 15 SIR MARTIN MOORE–BICK: In the concrete?
 16 A. It is, yes.
 17 MS GRANGE: Yes, and what is the problem with pipes being
 18 embedded in concrete, can you just explain?
 19 A. In the context of being able to reconnect it and use it?
 20 Q. Yes.
 21 A. Not being able to visibly inspect it.
 22 Q. Right, yes.
 23 It's right, isn't it, that there weren't any sleeves
 24 around the original pipework, so the pipe was just
 25 directly concreted into the floors; is that correct?

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

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

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

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1 two issues with mechanical ventilation: one, there is
2 a source of ignition, which is a problem, obviously, if
3 there's gas escaping from a leak on the pipe; and also
4 should that mechanical ventilation break down, therefore
5 there is no ventilation, and therefore it's not
6 suitable — mechanical ventilation isn't suitable for
7 providing the ventilation requirements specified by G/5
8 for gas pipes in that location.
9 Q. Yes. Yes. Because it's right, isn't it, that
10 ideally — well, the recommendation is that you have
11 natural ventilation around a gas pipe; is that correct?
12 A. It is, natural ventilation, indirect and direct
13 ventilation, dependent upon the construction used.
14 Q. Yes, thank you.
15 Let's look, then, at the marked-up photographs
16 showing the route that he was proposing. If we can go
17 to {CAD000000054/4}.
18 Here we can see a marked-up map showing the gas
19 services coming in from the east, which is where the
20 other two services come in from, so he's sending that,
21 and you can see he's marking a new supply on to this
22 map, I think in the yellow arrows.
23 If we then go to page 9 {CAD000000054/9}, we can see
24 a photograph. This is a photograph of the east side of
25 the tower, at ground level, and what Mr Boyle's done is

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1 marked up the three services coming in, and is it right
2 that the new service was the 4-inch service at the right
3 of this picture? Is that correct? We can see there is
4 a 10-inch service going in to the left.
5 A. The 4-inch and the 10-inch are the existing supplies.
6 Q. Ah, I see. Sorry, that's a mistake in our notes.
7 A. Yeah.
8 Q. Sorry. So is this just showing you what the existing
9 services are that are going in?
10 A. Yeah, so —
11 Q. I see.
12 A. — the 10-inch and the 4-inch — the 10-inch is to the
13 boiler, the landlord supply, and the 4-inch was to the
14 existing six risers.
15 Q. Yes, thank you.
16 If we go to page 10 {CAD000000054/10}, we can see —
17 is this right? — that with these yellow lines he's
18 showing how the service would come into the basement at
19 around 5 metres high; is that correct?
20 A. It is, yes.
21 Q. Yes.
22 Page 12 {CAD000000054/12} shows us how it would come
23 into the basement and then up through the ceiling of the
24 basement; is that correct?
25 A. It is, yeah.

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

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

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

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

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1 pipework entered the flats?
 2 A. Yeah, there are restrictions on the length of pipe that
 3 can be run inside a residential property. That length
 4 is 2 metres. So to — if we would have — to get back
 5 to the original meter locations, we would have had to
 6 have laid or installed pipe at a greater length to
 7 2 metres, with also — we'd have introduced fittings.
 8 That isn't allowed under the specifications that we work
 9 to, so we had to look for a location for the meter to be
 10 relocated that was within that 2-metre maximum length.
 11 Q. Yes, thank you. Yes, that's helpful. So they're
 12 effectively within 2 metres of the front door?
 13 A. Yes, exactly.
 14 Q. Yes. So they're moved, just to be clear, from the
 15 kitchen cupboards to being by the front door; is that
 16 correct?
 17 A. There is a room next — so as you come through the front
 18 door, there is a hallway and there is a room next to
 19 that hallway, and that's where the meter was relocated.
 20 Q. Yes. I'll take you to some pictures of that in due
 21 course, we'll have a look at that.
 22 Now, Simon Boyle attaches some more marked-up
 23 photographs to this second survey, and these illustrate
 24 how he proposed the proactive works to be installed, ie
 25 this was the works later to extend the riser to serve

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

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

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1 Now, would they have examined this proposed route
 2 for themselves? I'm looking to explore the extent to
 3 which they would have just taken what Mr Boyle said in
 4 his survey, or would they have separately asked
 5 themselves the question whether that was a sensible
 6 route?
 7 A. They would have asked the question, yes. They would
 8 have asked for alternative routes. Whether or not Simon
 9 could find an alternative route, I'm not sure. That's
 10 the survey information that we received. It enabled the
 11 designers to extend the reactive works to the flats that
 12 would have been part of the planned proactive works.
 13 Q. Right.
 14 Thinking about both surveys that Mr Boyle did, the
 15 first one showing the route of the new riser and the
 16 second showing more about the proactive works, was it
 17 the responsibility of the tRiIO designers to evaluate
 18 the safety and compliance of those routes themselves?
 19 A. It was, yes.
 20 Q. Right. So they couldn't just rely on Mr Boyle's
 21 surveying work, they had to ask themselves separately
 22 whether it was a safe and compliant route to follow; is
 23 that correct?
 24 A. Absolutely, yes.
 25 Q. Now, let's look at the first design, I'm going to call

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

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

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

9 A. That's better.

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

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

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

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

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

18 What was T/PR/ML4?

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

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

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1 called GASWorks9.

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

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

12 Q. Yes, I see.

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

15 A. Yeah, it's a hydraulically — it models using
 16 hydraulically — analysis.

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

19 A. It does, yes.

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

23 A. No, it doesn't.

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

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1 that the gas main into the building?

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

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

5 A. It did.

6 Q. Yes.

7 And the red bow—shaped symbol, is that an isolation
 8 valve?

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

10 Q. PIV, yes, thank you.

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

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

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

21 Q. Right, yes.

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

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1 A. Yeah, it is.

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

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

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

8 A. Yeah.

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

14 A. Yes, that's right.

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

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

22 A. Yes, yeah.

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

25 A. Yes.

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1 Q. And the hard black line around some of those laterals
2 shows the boxing—in.
3 Now, is it right — and this is important — that in
4 this particular design the boxing—in is only on the
5 communal lobby side, where the pipes were to be boxed in
6 completely?
7 A. Yeah, so as the pipe went through the wall from the
8 stairwell into the communal lobby —
9 Q. Yes.
10 A. — on that side of the wall in the communal lobby, the
11 extent of the pipe in the lobby would have been boxed
12 in.
13 Q. Yes. So once it's in the lobby, it's got its own little
14 compartment around it, but when it's in the stairs,
15 according to this first design, the pipe was going to be
16 naked; is that correct?
17 A. Yes, it would be — it was segregated from the — it
18 is for ventilation purposes, because of the mechanical
19 ventilation that I referenced earlier.
20 Q. Yes.
21 A. So we segregated this pipe from the lobbies where the
22 mechanical ventilation was and it in effect become part
23 of the stairwell. It was open—ended into the stairwell.
24 Q. Yes, thank you. So there would be oversized holes,
25 wouldn't there, around the pipe as it goes into the

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1 lobby —
2 A. That's right, yes.
3 Q. — to allow a free flow of ventilation from the
4 boxing—in back into the stairwell; yes?
5 A. Yes, correct.
6 Q. And the stairwell itself would be — this is the
7 intention — to provide the natural ventilation to the
8 riser itself; yes?
9 A. Yeah. So for design 1 there was ventilation at roof
10 level.
11 Q. Yes.
12 A. And I think it's important to note that the pipe in the
13 stairwell in design 1 was a welded system.
14 Q. Yes.
15 A. So direct ventilation was available at the roof vent,
16 and at the bottom of the stairwell we had indirect
17 ventilation, which was the door movement, air movement,
18 resulting from the door into the stairwell. So we had
19 indirect ventilation at the bottom of the stairwell, and
20 direct ventilation at the top.
21 Q. Right.
22 A. And that was the design that was produced in design 1.
23 Q. Then the red text at the bottom of this inset drawing
24 says:
25 "Boxing to be open ended into communal stairwell to

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1 allow ventilation of the lateral pipework."
2 That's what we were just discussing; yes?
3 A. That is it, yes.
4 Q. Yes.
5 Just to visualise the hole around the pipe, through
6 the stair wall and into the lobby, if we can just look
7 at a picture, {CAD00001653}.
8 This is a photograph of the lateral on the stair
9 side going through the wall into the lobby, and there we
10 can clearly see the oversized hole; is that correct?
11 A. That is that, yeah.
12 Q. And it's there for ventilation purposes?
13 A. It's there to vent, yes, for the laterals, yeah.
14 Q. Yes. Yes.
15 So this design did require the compartment between
16 the stair and the lobbies to be breached to ensure that
17 the gas pipes could be ventilated; that's right, isn't
18 it?
19 A. It is.
20 Q. Yes.
21 Now, can we look at the design risk register now
22 that tRIIO completed in relation to this design. That's
23 at {TRI000000369}.
24 At the top we can see this is called a "CDM Design
25 Risk Register", and in the box underneath that we can

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1 see it's dated 15 November 2016.
2 Beneath that, there is a box, or two below that. We
3 can see the designer's name, Ashley Johnson, and just
4 below that it says, "Project RAG Status based on
5 Residual Risk Score".
6 Can you just help us, what does RAG stand for?
7 A. So it determines — so very, very simply in terms of RAG
8 is red, amber, green, red being higher risk than amber,
9 amber being higher risk than green.
10 Q. Yes.
11 Then we can see below that, highlighted in green,
12 the score for this, under this assessment, is 17; yes?
13 Is that right?
14 A. Yeah.
15 Q. And the significance of that can be seen by looking at
16 the key beneath that, because what it says in the key
17 beneath that is if it's less than 18 — it's very tiny
18 text, I don't know whether we can make it any better.
19 So in the smaller little green rectangle it says if it's
20 less than 18, the wording says:
21 "Issue to Ops; No [Hazard]/Op Handover Meeting
22 Required."
23 Then in red it says if it's greater than or equal to
24 18, "Full DRA required". Is that right?
25 A. That is right, yes.

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1 Q. What does a full DRA mean?
 2 A. So a DRA stands for a design risk assessment.
 3 Q. Yes.
 4 A. It may help if I explain the process.
 5 Q. Yes, please do.
 6 A. So the design team within tRIIO designed MOB's projects,
 7 but it also designed mains replacement projects and
 8 various other activities that were required under the
 9 contract. Every project went through the design risk
 10 register process, and it was those projects that were
 11 deemed to have a higher level of risk after going
 12 through that process whereby a more detailed design risk
 13 assessment would be undertaken.
 14 In this instance, for design 1, the risk was felt at
 15 that time it was sufficiently low enough not to require
 16 a design risk assessment.
 17 Q. Yes, thank you.
 18 So because the score came to 17 in this instance,
 19 there was no need to consider any further risks in this
 20 design; is that correct?
 21 A. That's right, yes.
 22 Q. Yes.
 23 If we go to the bottom of the page, we can also see
 24 a box right at the bottom that says, "Manual DRA
 25 override needed?" Do you see that?

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1 A. Yes.
 2 Q. What does that mean?
 3 A. If — so the design risk register requires information
 4 to be input, and a score is generated from the actual
 5 system itself. Now, if the designer at that point — if
 6 that, for example, comes out at 10, but the designer
 7 feels that, in this instance, a design risk assessment
 8 is required, he can override that and go to the full
 9 design risk assessment.
 10 Q. So it's a human being —
 11 A. Yes, the —
 12 Q. — countenancing what's happened with the system?
 13 A. There is a security. Look at it as a security level, in
 14 effect.
 15 Q. In this case it looks like the designer did not manually
 16 override the process and go on and do a full design risk
 17 assessment; is that correct?
 18 A. It is, yes.
 19 Q. Yes.
 20 Let's just have a quick look to see what would have
 21 been considered had that DRA process been triggered.
 22 A. Yeah.
 23 Q. If we can go to {TRI00001218}.
 24 This is the design risk assessment which was
 25 conducted later, in March 2017. We're going to come to

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1 that in due course and see that there was a second
 2 design risk assessment process. But just for the moment
 3 I want to see what would have been considered, the
 4 questions that would have had to be considered, if this
 5 DRA process had been triggered.
 6 If we can go to page 4 of this document
 7 {TRI00001218/4}, and towards the bottom of the table —
 8 sorry, again, it's very tiny writing — if we could blow
 9 up items 19, 20 and 21, what we get is in the header in
 10 blue, it says "MOBs Specific Hazards". So, as
 11 I understand it, these are specific hazards which might
 12 arise in multi-occupancy buildings; is that correct?
 13 A. Yes.
 14 Q. Beneath that, we've got three items that are asked to be
 15 considered. We can see 19 is "Breach of Fire
 16 Compartments"; 20, "Failure Mode — Expansion south
 17 facing pipework & thermal expansion", so that's about
 18 expansion of pipework; and 21 is "Inadequate
 19 ventilation". Do you see those three matters there?
 20 A. Yes.
 21 Q. So it's right that those three items are only considered
 22 if there is a design risk assessment process; is that
 23 correct?
 24 A. It is, yes.
 25 Q. So unless someone's manually overridden it, or unless

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1 the score is high enough, these questions are not asked
 2 at the design risk assessment process; is that correct?
 3 A. Yes, they're not — they wouldn't have been in this
 4 instance.
 5 Q. Yes.
 6 Now, can we agree that replacing the gas supply to
 7 Grenfell Tower did involve breaching of fire
 8 compartments?
 9 A. It did, yes.
 10 Q. And pretty important fire compartments, weren't they?
 11 A. Yes.
 12 Q. As in the stairs, the single stair; yes?
 13 A. Yes.
 14 Q. And through to the communal lobbies —
 15 A. Yes.
 16 Q. — for flats.
 17 It also involved — can we agree this — a complex
 18 ventilation strategy?
 19 A. Yes.
 20 Q. So can we take it from this that the tRIIO designer did
 21 not specifically consider these features in any detail
 22 when the initial design was created?
 23 A. He — they considered the breaches of the fire
 24 compartments in terms of boxing—in. The boxing—in was
 25 fire rated, but it wasn't part of the design risk

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

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

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1 We can see on the right-hand column there is
 2 a paragraph 4.40, and the heading to that is "Gas
 3 service pipes in protected stairways". Do you have
 4 that?
 5 A. Yes, I do, yes.
 6 Q. We can see what it says. It says:
 7 "Gas service and installation pipes or associated
 8 meters should not be incorporated within a protected
 9 stairway unless the gas installation is in accordance
 10 with the requirements for installation and connection
 11 set out in the Pipelines Safety Regulations 1996 ... and
 12 the Gas Safety (Installation and Use) Regulations
 13 1998 ..."
 14 So, in other words, is it right that this appears to
 15 say that you can build a gas riser in a protected stair,
 16 but it has to meet other technical requirements of
 17 a gas riser in those other regulations?
 18 A. That's what that says, yes.
 19 Q. Were you aware of this provision within Approved
 20 Document B at the time?
 21 A. I wasn't personally.
 22 Q. No. Would you expect your — I mean, you have mentioned
 23 before that you wouldn't have expected your designers to
 24 have been particularly familiar with Approved
 25 Document B.

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

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

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

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1 can see it says this:
 2 "Goods lifts and service lifts should not be located
 3 within fire—fighting shafts. Only services associated
 4 with the fire—fighting shaft should pass through or be
 5 contained within the fire—fighting shaft.
 6 A fire—fighting shaft should not contain any cupboards
 7 or provide access to service shafts serving the
 8 remainder of the building."
 9 Do you see that?
 10 A. Yes.
 11 Q. Now, can we agree, just looking at that now, that the
 12 practical effect of that is that if the stairwell at
 13 Grenfell Tower was a firefighting shaft, then there
 14 should not have been a gas riser in it?
 15 A. In terms of — yes, in this document, yes.
 16 Q. In 2016, is that something that tRiIO and its designers
 17 understood?
 18 A. No.
 19 Q. No, thank you.
 20 I just want to focus now on some of the ventilation
 21 aspects of the first design.
 22 If we can go back to Approved Document B, this is
 23 {CLG00000224/81}. This is within the B3 section, which
 24 is about internal fire spread, and it includes
 25 provisions about compartmentation.

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

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1 riser system, ensured that there was direct or indirect
 2 ventilation at the top and the bottom: at the top,
 3 direct ventilation through the roof vent, and at the
 4 bottom there was a door on to the atrium level, there's
 5 a door going on to a landing that goes on to the atrium,
 6 and then there's the front doors, and it's the door
 7 movements, air movement, over 30 minutes which would
 8 have satisfied the indirect ventilation at the bottom.
 9 That's how the design was produced.
 10 Q. Is it right that that would have to rely upon the riser
 11 being welded steel?
 12 A. Yes, correct.
 13 Q. Now, looking at that paragraph 8.41, again, just to be
 14 clear, I think from what you have said, you wouldn't
 15 have expected the tRiIO designers to have known about
 16 that provision at the time they were designing the
 17 Grenfell Tower riser?
 18 A. That's correct.
 19 Q. Yes.
 20 If we can go to {CAD00000035} now.
 21 These are some notes of something called the MOB's
 22 performance call dated 25 October 2016. You can see
 23 that in the subject of this email, and what we're going
 24 to get is a whole list, I think, of buildings.
 25 Can you just explain what this MOB's performance call

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1 was?
 2 A. There was a twice—daily call between the client, Cadent,
 3 and the tRiIO operational team, and that twice—daily
 4 call was looking at gas off. So where gas risers have
 5 been disconnected due to a gas escape, how long would it
 6 take to get the gas back on those customers. So it was
 7 a performance meeting held by the client, where we would
 8 be asked the question as to what was still off, what was
 9 on, how long was it going to take to get it on, and that
 10 was a twice—daily call that was held.
 11 Q. Yes, thank you.
 12 If we look on page 2 of this document
 13 {CAD00000035/2}, at the top of the page, we can see
 14 the record of the discussions that were held about
 15 Grenfell Tower.
 16 We can see about halfway down that entry, on
 17 11 October 2016, it says:
 18 " ... potential buy out — awaiting confirmation in
 19 hand ..."
 20 Then do you see below that it says:
 21 " ... route that was identified doesn't have
 22 ventilation — buy out for whole building."
 23 Can you see those words in those notes?
 24 A. Yeah. Yes, I can.
 25 Q. Can you just help us as to what was being discussed

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1 based on those notes?
 2 A. I can't comment on the actual call, I wasn't involved in
 3 that. It appears to be a discussion around the survey,
 4 what was identified from the survey as a potential
 5 route, and the thinking at that time as to whether or
 6 not that was a viable option.
 7 Q. Yes.
 8 A. Hence can we go down the buy—out route and not put gas
 9 back into the building.
 10 Q. Yes.
 11 A. You know, in terms of what you've presented there,
 12 I think that's what I would take from that.
 13 Q. Yes. In terms of the words where it says "route that
 14 was identified doesn't have ventilation", does that
 15 trigger a memory in terms of what the problem was about
 16 ventilation that was being discussed at this point?
 17 A. I wasn't involved with that —
 18 Q. Right.
 19 A. — call, so I can't —
 20 Q. Right. So you can't help about whether that was the
 21 problem of mechanical ventilation being in the communal
 22 lobbies?
 23 A. It could very well be, yes, yes.
 24 Q. We saw that in Simon Boyle's initial survey of
 25 12 October 2016, there was no express reference to

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1 a ventilation strategy in that, but if we go back to his
 2 second survey that he did in November 2016, this is at
 3 {CAD00000038}.
 4 At the bottom of that page — this was the email
 5 that he sent — we can see there is also a heading
 6 "Ventilation/G5".
 7 Would you understand that "G5" to be a reference to
 8 the IGEM/G/5 technical standard?
 9 A. It is, yes.
 10 Q. He says this:
 11 "Once the pipe work is installed, the riser system
 12 could be segregated from the mechanical air extraction
 13 by being boxed in. There is a route out to fresh air
 14 through the basement & would assume a route out through
 15 the top floor (no access to roof as locked)."
 16 Now, was it acceptable, in your view, for the tRiIO
 17 designers to have relied on that statement by
 18 Simon Boyle as having given sufficient consideration to
 19 the ventilation question for the pipework?
 20 A. No, it's the designers' responsibility to produce the
 21 design and the ventilation requirements.
 22 Q. So is it right that you would have expected them, the
 23 tRiIO designers, to have given separate consideration to
 24 the ventilation aspects of this new riser design?
 25 A. Yes.

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

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

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

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

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1 ventilation required for the basement.
 2 Q. Yes.
 3 A. As the pipe route went through the first riser cupboard,
 4 it went through that riser cupboard, up through the
 5 ceiling and into the second riser cupboard, those holes
 6 were to be filled, and the ventilation would have been
 7 provided through the — as you've seen earlier on, the
 8 louvred doors, which went out onto a landing, which went
 9 onto a door, which went out to the atrium, which went
 10 out to the front doors. So the ventilation in the riser
 11 cupboards 1 and 2 on — get the floor numbers right, the
 12 floor above the basement and the next floor, that's how
 13 the ventilation — the designers satisfied the
 14 ventilation requirements.
 15 As it went into the storeroom, before it went into
 16 the stairwell, there was a door, so all of those holes
 17 should have been filled in or would have been filled in
 18 between the basement and as it come into the stairwell.
 19 Q. Yes.
 20 A. So they would have been filled in, and the ventilation
 21 was through the door, people going into the rooms, door
 22 movements, and then the route outside. That's the
 23 intent of the design.
 24 Q. Right.
 25 A. Then the stairwell was —

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

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1 ventilation and suggesting that this design was going to
 2 be adequate in terms of the ventilation that it
 3 provided?
 4 A. At the time there was no calculations that supported
 5 that design.
 6 Q. Should there have been?
 7 A. Yes, there should have been.
 8 Q. Yes, and that was an omission —
 9 A. Yes.
 10 Q. — in the design process? Yes.
 11 Now, in terms of compartmentation, I just want to
 12 look at some discussions that occurred about breaching
 13 the stair wall into the lobby.
 14 If we can go to {TMO00833486}.
 15 This is an email chain between Charlie Saul at the
 16 TMO — we saw before that he was the contact point at
 17 the TMO on this issue —
 18 A. Yeah.
 19 Q. — and Harvey Smith of tRHO, and also Martyn Wisken,
 20 the designer, is copied in; yes?
 21 A. Yes.
 22 Q. And Harvey Smith was the project manager?
 23 A. That's correct.
 24 Q. Yes.
 25 If we look at page 2 of this chain first

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

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1 stairwell . The worry is that if the boxing continues
 2 into the stairwell then this will allow the passage of
 3 smoke through the block.
 4 "How could the flow of smoke be controlled within
 5 the open ended boxing?"
 6 So some questions are being asked by the TMO about
 7 the boxing—in and compartmentation in this email.
 8 If we go to the response from Martyn Wisken at
 9 {TMO10015271}, this is a response the same day,
 10 24 November 2016, and Martyn Wisken says this:
 11 "The intention is that the boxing will isolate the
 12 pipework from the mechanical ventilation in the communal
 13 areas. It will be vented directly to the stairwell at
 14 one end (which itself is well ventilated) and run to a
 15 'dead end' at the point of entry to the individual flats
 16 at the other. In case of fire in the stairwell , any
 17 smoke will travel along the boxing to a dead end and
 18 would be isolated within the boxing. In turn any smoke
 19 within the communal area would not get to the stairwell
 20 as the boxing would be fire rated."
 21 So Martyn Wisken is explaining how compartmentation
 22 was intended to be preserved in this first design; yes?
 23 A. That's correct, yes.
 24 Q. Yes.
 25 At the same time, these questions were referred to

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1 the TMO's fire risk assessor, Mr Carl Stokes, if we can
 2 go to {TMO10015305}.
 3 Now, you can take it from me that in this chain we
 4 see that Janice Wray of the TMO forwards this chain of
 5 correspondence to Mr Stokes, and at the top we can see
 6 Mr Stokes' email of 25 November 2016, and he says this:
 7 "All noted.
 8 But what happens if the fire is in the flat , does
 9 that mean that the fire can travel via the boxing to the
 10 stairwell ?
 11 "This is notifiable work so I am assuming that all
 12 the work will go through the Building Regulations
 13 process and meet all the requirements of the Building
 14 Regulations?
 15 "Can the utility company please provide a full
 16 method statement and schedule of works showing that all
 17 the work will meet the Building Regulations
 18 requirements."
 19 So that's Mr Stokes' response.
 20 Now, just pausing there, did tRiIO think at the time
 21 that this gas riser work was notifiable to
 22 building control?
 23 A. We didn't, when we was producing the design, no.
 24 Q. Can you just explain why you didn't think it was
 25 notifiable ?

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1 A. It was — we — just in terms of the response earlier
 2 on, we — the designers and the design team understood
 3 by designing the riser system to G/5 that the
 4 requirements of the Building Regulations would be
 5 required, and in submitting that design to the TMO,
 6 Charlie Saul, for approval, our understanding would be
 7 that the TMO would deal with building control if they
 8 felt it was a requirement.
 9 Q. Right.
 10 Did anybody with expertise in fire safety ever check
 11 tRiIO's designs, so on your side of the fence, to make
 12 sure there was nothing about the design that would
 13 impact and compromise fire safety in the building?
 14 A. No, no, we didn't.
 15 Q. Now, we can see that Mr Stokes has raised a question
 16 about the effect of the boxing—in and the potential
 17 effect of smoke travelling from a flat which is on fire
 18 to the stairwell .
 19 Let's just look at the response to that. If we can
 20 go to {TRI000000405}, and if we look at the second email
 21 down on that first page, on 28 November 2016 we can see
 22 that Martyn Wisken gets back to Carl Stokes and he says:
 23 "Carl,
 24 "Our pipework must be installed in accordance with
 25 IGEM/G/5, this in turn has been written in accordance

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1 with the Building Regs — all pipework will be fire
 2 stopped between fire compartments."
 3 Okay, so that's the response.
 4 At the very top of the page, Carl Stokes has
 5 replied :
 6 "Thank you Martyn."
 7 Do you see that?
 8 A. Yes.
 9 Q. Looking at that response from Martyn Wisken, can we
 10 agree that it's unclear as to whether what he's talking
 11 about there is holes between flats and the lobby which
 12 would be firestopped, or holes between the stair wall
 13 and the lobby being firestopped? He is not clear on
 14 that, is he?
 15 A. It's not clear from the email.
 16 Q. No. And it's right, isn't it, that there was no
 17 intention — we've discussed this before — of
 18 firestopping in the final design around the pipe between
 19 the stairs and the lobby, because those oversized holes
 20 were necessary for the pipes to be ventilated —
 21 A. Yes.
 22 Q. — back to the stairs; yes?
 23 A. The designer assumed that the boxing in — or in terms
 24 of the producing the design with respect to the
 25 ventilation requirements, the boxing in of the laterals

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1 in the lobby in effect became part of the stairwell fire
 2 compartmentation.
 3 Q. Yes.
 4 A. And the holes would need to be left open so that if gas
 5 did escape from the pipe in the lobby, it could find its
 6 way out to the stairwell, which was ventilated, as
 7 I discussed earlier on.
 8 SIR MARTIN MOORE—BICK: But you wouldn't get a dead end, as
 9 he described it, unless you had firestopping between the
 10 flat and the lobby, would you?
 11 A. There was — in terms of — so as the —
 12 SIR MARTIN MOORE—BICK: All I'm saying is, Mr Wisken
 13 described the boxing—in as providing a dead end at the
 14 end opposite to the stairs, and you would only get
 15 a dead end if you firestopped the hole between the lobby
 16 and the flat, wouldn't you?
 17 A. The dead end Martyn was referring to was — where the
 18 boxing—in ended within the lobby would have been a dead
 19 end, so there would have been a dead end — so the
 20 boxing—in — if you can visualise the boxing—in being
 21 constructed, it may have ended up at that wall there,
 22 that would have been the dead end, and then there would
 23 have been an open end with the hole into the stairwell.
 24 SIR MARTIN MOORE—BICK: But there would only have been
 25 a dead end if the hole through which the pipe inside the

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

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1 the context of the one email there, then, yes, it's —
 2 I agree.
 3 MS GRANGE: Yes.
 4 Carl Stokes actually then attends and writes
 5 a report in January 2017, after the riser's been built.
 6 If we just go to that, it's {CST00003082}.
 7 So we can see this is a letter of 30 January 2017 to
 8 Janice Wray at the TMO, and you can see from the first
 9 line he says:
 10 "Thank you for asking me to comment on look [sic] at
 11 the installation of the new gas pipe work within
 12 Grenfell Tower ..."
 13 Then he gives a description of it.
 14 Then we can see, if we go to the bottom of page 3
 15 {CST00003082/3}, under "Conclusions", at point 3 he
 16 says:
 17 "Documentation should be provided by the gas
 18 contractor showing the fire rated materials used for the
 19 fire stopping of the compartment walls and the fire
 20 rating of the fire collars used."
 21 Sorry, I should have read point 2 first,
 22 I apologise. He says:
 23 "All holes in compartment wall must be suitably fire
 24 stopped using fire rated materials of a minimum of
 25 90 minutes fire rating."

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

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1 Q. Right.
 2 A. And whether or not it was passed to the designers at the
 3 time or just to Ms Wray and whether or not she passed
 4 that to us ...
 5 Q. Yes. Because certainly the photo we can see there on
 6 the screen, "Pipe penetrating the staircase landing,
 7 hole through the landing, the hole not made good", that
 8 comment, "the hole not made good", perhaps suggests that
 9 he doesn't appreciate that there's got to be a hole
 10 around that pipe for the staircase to ventilate
 11 properly, hasn't there?
 12 A. That's exactly right, yes.
 13 Q. Yes.
 14 Now, it was shortly after this exchange that the
 15 design was settled and agreed.
 16 If we can look at {TMO00828915}.
 17 This is an email chain between tRiIO and the TMO on
 18 30 November 2016, and if we can go within it to page 3
 19 {TMO00828915/3}, we can see there is an email from
 20 Charlie Saul in the bottom half of that page to
 21 Martyn Wisken and Harvey Smith, and he says:
 22 "Thank you Martin.
 23 "Our Health and Safety department have asked the
 24 following questions of the proposal ..."
 25 And we can see he wants a method statement,

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1 a schedule of works, and then the third bullet is:
 2 "Confirm that works will meet Building Regulations."
 3 Then on page 2 {TMO00828915/2}, if we go up, midway
 4 down the page, the first email is from Harvey Smith to
 5 Charlie Saul. In the third paragraph down, he writes:
 6 "We do comply with building regulations and will
 7 take advice from you, or your engineers on the fire
 8 rating required for this particular installation."
 9 Then he goes on and talks about other points.
 10 Then if we go up to the first page {TMO00828915/1},
 11 at the top is an email from Charlie Saul on
 12 30 November 2016, and in the second line he writes:
 13 "Please proceed with works as laid out in the plans
 14 discussed."
 15 Now, do you understand that this was the TMO's
 16 approval of the design for the works and their
 17 instruction to proceed?
 18 A. Yes.
 19 Q. And we know that subsequently, on 9 December 2016, works
 20 did commence at the tower; is that correct?
 21 A. It is, yes.
 22 Q. Now, we know that concurrently with these events there
 23 was also parallel consideration being given to the
 24 option of buying out the gas, and I've just got a few
 25 questions for you on that now.

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

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

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1 process, but my understanding is that they need to get
 2 every customer within the building's agreement to buy it
 3 out. If they couldn't get agreement of all the
 4 customers then they couldn't proceed with that option.
 5 Q. Yes. Let's look at some emails on this.
 6 If we go to {CAD00000058}, we can see the second
 7 email down is from someone called Mary Ryan at Cadent on
 8 16 November 2016, and from the second paragraph down she
 9 says:
 10 "With reference to your first point on compensation,
 11 all gas users will be entitled to the maximum Guaranteed
 12 Standard of Services Compensation of £1500.
 13 "Please accept my apologies for not receiving any
 14 firm information from tRiIO to date on either
 15 a restoration or buy-out proposal. The decision on
 16 whether a buy-out is a viable solution rests with myself
 17 on behalf of National Grid, based on cost of replacement
 18 vs compensation to gas users. Is there any information
 19 you could share on confirmed gas users within the
 20 building to expedite this option."
 21 So she appears to be apologising for the fact that
 22 tRiIO haven't responded on this point, but saying,
 23 "Buy-out is actually a question for us, Cadent"; is that
 24 correct?
 25 A. That's correct, yes.

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1 Q. Then if we can go to {CAD00000059}, if we look at the
 2 bottom of page 1, we can see an email from Mary Ryan to
 3 Martyn Wisken at tRiIO on 17 November 2016, and she
 4 says:
 5 "Unfortunately, your colleagues have been stating
 6 that this is a buy-out location to the local authority
 7 and [National Grid] for approximately the last month.
 8 You are correct, we will only buy out a whole building
 9 not a single riser etc. I have no idea what detail the
 10 discussions have reached with reference to the above
 11 hence the chasing e-mails and information requested on
 12 the t-cons."
 13 Now, is it your experience that Cadent won't buy out
 14 all of a building when only one riser has been cut off?
 15 A. Yes.
 16 Q. That's what she is suggesting there?
 17 A. Yes.
 18 Q. But in this situation, wasn't that rather illogical, in
 19 circumstances where it had already been decided to
 20 replace the other risers via the new riser, so there
 21 would need to be quite extensive works to put that
 22 proactive programme in place?
 23 A. Yes.
 24 Q. Do you know whether that was ever considered as part of
 25 the Grenfell project?

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1 A. In terms of buying out the whole building?
 2 Q. Yes.
 3 A. That is the buy-out process.
 4 Q. Yes, but she seems to be saying, "We're only going to
 5 buy out a whole building, not a single riser", but not
 6 recognising that actually there had been a decision to
 7 replace all of the risers in the building, so in terms
 8 of the cost-benefit analysis that was being done —
 9 A. Mary would have been aware of the proactive element of
 10 it.
 11 Q. She would, would she?
 12 A. Absolutely, yes.
 13 Q. Just help us with this: in circumstances where buy-out's
 14 been rejected as an option by Cadent, is it right that
 15 tRiIO could ask for that decision to be re-opened if,
 16 for example, there were safety concerns about the riser
 17 design?
 18 A. It would come back down to whether or not it was safe —
 19 we could construct a safe and compliant pipeline system.
 20 If we couldn't construct a safe and compliant system
 21 then we shouldn't be putting gas back into that
 22 building, and I think that would have started
 23 a different conversation around the buy-out of the
 24 building.
 25 Q. Are you aware of instances in other projects where

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1 buy-out has been rejected as an option, tRiIO have been
 2 asked to do replacement works, but then tRiIO have gone
 3 back to Cadent and said, "Sorry, we've looked at this
 4 really carefully and it's simply not safe to do this,
 5 you're going to have to look at buy-out again"? Has
 6 that ever occurred in your experience?
 7 A. Not in my experience.
 8 Q. No.
 9 A. Not that I can recall.
 10 Q. Is it tRiIO's position that the route and the design was
 11 a safe and compliant one as things stood in
 12 November 2016?
 13 A. It was, yes.
 14 Q. Right. And it's right, isn't it, tRiIO didn't ever come
 15 back to Cadent and re-open the buy-out question because
 16 no safety concerns were raised about putting the riser
 17 through the stairs and the associated works?
 18 A. Yeah. When the original buy-out option was rejected,
 19 the question was asked. We proceeded to produce what we
 20 considered to be a safe and compliant design, and from
 21 that point on, we proceeded with, you know, the
 22 pre-construction and construction activity, so we never
 23 reverted back to them asking the question.
 24 Q. Yes.
 25 Now, in terms of the construction work, the

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1 construction of the new riser commenced on
 2 9 December 2016. Does that sound right?
 3 A. Yes, yes.
 4 Q. The riser was then tested and commissioned by
 5 25 January 2017, we believe.
 6 A. Yeah, yes.
 7 Q. And then gas was reinstated to most of the flats ending
 8 in 2 by 10 March 2017. Does that sound right?
 9 A. That's correct.
 10 Q. It's correct, isn't it, that the boxing—in of the
 11 laterals in the lobbies, on the lobby side, was not
 12 complete by the time that the gas was reinstated, and
 13 it's right, isn't it, that this was not done by the time
 14 of the fire? Is that correct?
 15 A. That is correct.
 16 Q. That was not in line with the ventilation and
 17 compartmentation design, was it?
 18 A. That's correct.
 19 Q. During that period, so when the boxing—in hadn't been
 20 completed, wasn't there a danger that gas might have
 21 leaked but could not ventilate naturally; it would
 22 ventilate into the communal lobbies and not to the
 23 staircase and then the outside as intended?
 24 A. The holes between the stairwell and the lobby were —
 25 you know, the oversized holes were still open, they were

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1 open. What hadn't happened was the boxing—in. So, yes,
 2 the answer to that is although there was a route out to
 3 the stairwell, the ventilation of the boxing—in wasn't
 4 complete and therefore the full ventilation process
 5 hadn't been completed.
 6 Q. Yes, so you've got a situation where, if there is a gas
 7 leak, the ventilation is inadequate during that period?
 8 A. Yes, yes.
 9 Q. Yes. And should that have happened, in hindsight?
 10 A. No.
 11 Q. No, it shouldn't have been left like that, should it?
 12 A. No.
 13 MS GRANGE: Mr Chairman, I think that's a good moment for
 14 the lunch break.
 15 SIR MARTIN MOORE—BICK: All right.
 16 MS GRANGE: I'm making good progress and I'm confident we
 17 certainly will be finished this afternoon.
 18 SIR MARTIN MOORE—BICK: Good.
 19 Well, it sounds as though counsel is going to move
 20 on to another topic, so that sounds like a very good
 21 point to have the break for lunch.
 22 We will stop now and we'll resume, please, at
 23 2 o'clock.
 24 Again, as I asked you before, please don't talk to
 25 anyone about your evidence while you're out of the room.

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1 THE WITNESS: Okay.
 2 SIR MARTIN MOORE—BICK: All right? Thank you very much.
 3 (Pause)
 4 Good, thank you very much. 2 o'clock, then, please.
 5 (1.00 pm)
 6 (The short adjournment)
 7 (2.00 pm)
 8 SIR MARTIN MOORE—BICK: Right, Mr Dolan, ready to carry on?
 9 THE WITNESS: Yes.
 10 SIR MARTIN MOORE—BICK: Good, thank you very much.
 11 Yes, Ms Grange.
 12 MS GRANGE: Yes, thank you.
 13 Just some brief questions at this point about the
 14 health and safety file under the CDM regulations.
 15 Now, we've touched on this file before, and do
 16 I take it you were familiar with the requirement under
 17 the CDM Regulations for the principal designer to
 18 prepare a health and safety file appropriate to the
 19 characteristics of the project, which had to contain
 20 information relating to the project likely to be needed
 21 during any subsequent project to ensure the health and
 22 safety of any person? Were you familiar with that?
 23 A. Yes.
 24 Q. Yes, thank you.
 25 Can you help us, did tRIIO, as principal designer,

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1 seek to obtain the pre-existing health and safety file
 2 from the TMO? Were those efforts made?
 3 A. We didn't specifically ask for a health and safety file,
 4 although we would have asked for any information that
 5 would have been available that could help us. But we
 6 didn't ask for a health and safety file.
 7 Q. Right. Why not, if the whole purpose of that file is to
 8 ensure that knowledge is passed on from project to
 9 project?
 10 A. It's not something that's been part of the tRIIO process
 11 to request the health and safety file from the building
 12 owner.
 13 Q. Right.
 14 Can we agree that, as principal designer, it was
 15 tRIIO's role to prepare, review and update the health
 16 and safety file as the project went along?
 17 A. It was, yes.
 18 Q. Yes, and that was the duty that started in the
 19 pre-construction phase and was ongoing until completion
 20 and handover of the file; yes?
 21 A. Yes.
 22 Q. Who was it at tRIIO who was actually responsible for the
 23 health and safety file for these works?
 24 A. The design manager would have taken overall
 25 responsibility for the process, which would have

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1 included making sure the health and safety file was
 2 created and was contributed to during the phases or
 3 various phases of the design and construction process.
 4 Q. Was that Mr Wisken?
 5 A. That was Mr Johnson.
 6 Q. Mr Johnson, sorry, yes.
 7 Did tRiIO actually prepare a health and safety file
 8 at the pre—construction phase?
 9 A. We did, yes.
 10 Q. Right, and did it keep it updated as the works were
 11 going on?
 12 A. Yes, it was.
 13 Q. At the end, was it tRiIO's intention to hand that over
 14 to the TMO?
 15 A. Yes, it was.
 16 Q. Right.
 17 A. It would have been handed back, apologies, to Cadent,
 18 the client.
 19 Q. Right, and then it was their responsibility to give it
 20 to the TMO?
 21 A. My understanding would be that that was, yes, the
 22 requirement.
 23 Q. Right, I see. Yes, thank you.
 24 Now, you've mentioned in your first statement that
 25 there were several concerns raised about the gas riser

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

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1 Q. Right. Is it right that tRiIO actually had to leave
 2 site after that incident?
 3 A. Yes, we was asked to leave site for a period of
 4 three weeks. I think it was approximately three weeks.
 5 Q. Right. Why were you asked to leave site?
 6 A. Because of the incident, asbestos being in the property,
 7 it had to be cleaned up. That created some concerns in
 8 terms of the activity that was being undertaken. We had
 9 to do some work, so we closed the job down, removed the
 10 health and safety file and the project pack from the
 11 welfare facilities that we had on site, and then over
 12 the coming days and weeks, we addressed certain issues
 13 and then recommenced the works.
 14 Q. Yes, and approximately when were those three weeks that
 15 you were off site?
 16 A. It was around about — it was during March.
 17 Q. Yes.
 18 A. Yes.
 19 Q. Yes.
 20 Now, let's look at an example of some of the
 21 concerns that were being raised.
 22 If we can go to {RBK00003601}.
 23 This is an email from Lee Chapman, one of the
 24 residents, to the TMO, copying in a number of others.
 25 If we look down at the body of the email, it's dated

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1 27 March 2017, and I just want to read the second and
 2 third paragraphs. He says:
 3 "We are sincerely concerned as residents living in
 4 the tower and that the fire risk that the recent
 5 installation of gas pipes has brought to the building.
 6 It is not just the installation itself that causes some
 7 alarm, but it is the risk that exposed pipes of any kind
 8 can cause to residents. The fact that these pipes have
 9 natural gas, which I'm sure you will understand is
 10 extremely [combustible] makes us feel in grave danger in
 11 the event of one of the pipes being compromised."
 12 Then he goes on in the third paragraph:
 13 "You may be aware, that recently the level of
 14 anti—social behaviour in the building is increasing,
 15 mainly involving children between 10 and young adults up
 16 to the age of 25. Given that many of the people who
 17 gain access to the building relatively easy due to the
 18 lack of security adds further alarm to safety concerns
 19 surrounding the gas pipes. Very few hours go by without
 20 someone smoking in the fire escape and sometime light
 21 small 'fires', or should I say highly flammable drugs.
 22 In the event the event that just one of the pipes begins
 23 to leak, all people in the building will suffer and more
 24 importantly are at risk of death or serious injury at
 25 least. Please can I insist that you MUST take this

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1 issue seriously as should an event happen it is our
 2 lives at risk." [sic]
 3 Now, was this a complaint that you became aware of
 4 during the time that you were involved with the project?
 5 A. I was aware there was concerns over the — as
 6 I mentioned earlier, in terms of the pipe and the risk
 7 or the concerns around vandalism and that that vandalism
 8 could cause a leak, yes.
 9 Q. Because it's right, isn't it, that others had complained
 10 about the risk of antisocial behaviour and vandalism
 11 causing a potential risk to this infrastructure?
 12 A. I understand so, yes.
 13 Q. Yes.
 14 Was that a particular risk to the riser, in your
 15 view, that particular risk?
 16 A. No. I think it's in my statement, I make mention that,
 17 whilst I considered it and took it seriously and the
 18 rest of the team did, the pipe was a steel pipe, it was
 19 welded, and therefore it would be very difficult to
 20 damage, very, very difficult indeed to damage, and in
 21 terms of fire, it has a very, very high temperature
 22 melting point. So in reference to the issues around
 23 fire or vandalism, it would take, in my opinion,
 24 mechanical means of actually breaking into that, cutting
 25 machines, which I wouldn't expect standard sort of

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1 vandalism to happen.
 2 I also drew on my experience — in between 2006 and
 3 2013, that was the last seven years that I worked for
 4 National Grid, between 2006 and 2010, I was the network
 5 engineer responsible for emergency and replacement for
 6 a quarter of London, and in that four-year period I'd
 7 never once experienced vandalism of any pipe causing
 8 a gas leak. And then for the three-year period from
 9 2010 to 2013, whilst working on the Gas Alliance
 10 project, I was the duty engineer for the whole of
 11 London, that's when I was promoted to that senior
 12 management role, and the duty manager for London, and
 13 again, not once — and that was a 24/7, 365 day a year
 14 emergency service, and I can't recall once ever being
 15 called out to a gas escape resulting from vandalism.
 16 So I based my judgement that whilst the concern of
 17 the residents was a valid concern, the actual risk was
 18 very, very low indeed, if not negligible.
 19 Q. Right, yes, thank you.
 20 Just sticking with this complaint email from
 21 Mr Chapman, if we go to the second page {RBK00003601/2},
 22 and look at the second paragraph, he says this:
 23 "Having seen these pipes numerous times, I am
 24 seriously concerned about how I will get out of this
 25 building alive in the event of a fire this added risk.

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1 At no point were we advised that a Gas pipe would be
 2 installed in a communal area, nor were we informed of
 3 the need to be extra vigilant. At the 22nd floor it is
 4 a very long way down from the window in the event that
 5 after 30 minutes of fire our house in engulfed."
 6 Now, when you were made aware of these complaints,
 7 to what extent did you step back and question whether it
 8 was right to have the gas riser in the stairwell?
 9 A. The gas pipe in the stairwell was, in our opinion,
 10 designed and compliant to IGEM/G/5, and therefore what
 11 we'd installed in the building was a compliant system,
 12 and therefore there was no concern, it was a compliant
 13 system, unless we started to question the regulations or
 14 the specification. So in our opinion it was compliant
 15 and therefore safe. So I had no real reason to
 16 question. The only — as mentioned earlier on, the only
 17 option available to us would have been not to put gas
 18 into that building, and as we felt we had a safe and
 19 compliant route, there was no need to act upon it.
 20 Q. Yes, but as I think you just made clear, that was purely
 21 looking, from your perspective, at IGEM/G/5 and not
 22 looking at the Building Regulations or the approved
 23 documents?
 24 A. That is correct, yes.
 25 Q. Can we go to {TMO10016548}, now. This is an exchange

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1 that Janice Wray of the TMO had with John Allen of RBKC
 2 building control.
 3 If we start at page 3 of this {TMO10016548/3},
 4 please, at the bottom of the page is an email of
 5 16 March 2017 from John Allen to Janice Wray, and he
 6 writes:
 7 "Janice, I am content that this work would be
 8 regarded as a repair providing there is no change to the
 9 fire safety implications. A building regulation
 10 application would not be required.
 11 "In particular to ensure that the riser replaces
 12 a riser in the same position. Gas risers and meters are
 13 not generally positioned within stairways or if they are
 14 they should be in fire resisting enclosures.
 15 "They should also reinstate and firestop any fire
 16 resisting enclosures that are affected as part of the
 17 installation."
 18 So we can see that that's what building control were
 19 saying.
 20 Now, pausing there, and from what you've told us,
 21 it's right, isn't it, that you understood that work
 22 reinstating gas risers was not generally regarded as
 23 work that required a building control application?
 24 A. That's correct, yes.
 25 Q. We can see here that Mr Allen is saying it would be

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1 regarded as a repair, therefore doesn't need Building
 2 Regulation approval, providing there is no change to the
 3 fire safety implications.
 4 Now, were you ever told that that was what
 5 building control were saying, that —
 6 A. I'm — sorry.
 7 Q. — it didn't need approval, provided there was no change
 8 to the fire safety implications?
 9 A. I wasn't personally aware of that email.
 10 Q. Right.
 11 Had you been asked at the time, "Are there any
 12 changes to the fire safety implications?", what would
 13 your answer have been?
 14 A. My expectation would have been we had a relationship and
 15 engaged with a member of the KCTMO. In sending our
 16 design through to the KCTMO, we'd have expected
 17 collaboration at that point if they had some concerns
 18 that our design, what we were submitting for their
 19 approval, would have created that situation.
 20 Q. Right. I understand that's the process, but if you'd
 21 been asked at the time, "Are there any changes to the
 22 fire safety implications involved in this riser
 23 replacement?", what would your answer have been?
 24 A. Yes.
 25 Q. Yes.

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1 A. Yes.
 2 Q. And tRIIO didn't ever see the need itself to contact
 3 building control directly?
 4 A. No, we went through the contact we had at the KCTMO.
 5 Q. Right.
 6 Now, there were a few more exchanges between Ms Wray
 7 and Mr Allen over the next few weeks. If we can go to
 8 another one, {TMO10016548}.
 9 This is an email from Janice Wray to John Allen of
 10 3 April 2017, and she writes this:
 11 "Thanks. We have now got their commitment to
 12 enclose the riser in a 2-hour fire-rated boxing.
 13 "Our Assessor has already highlighted the breaches
 14 in compartmentation and [National Grid] have confirmed
 15 these will be addressed.
 16 "A number of residents very unhappy and perceive
 17 this to be potential[ly] a very high risk and were
 18 asking RBKC to appoint an independent consult[ant] to
 19 investigate!
 20 "LFB are saying ([though] not yet in writing) that
 21 they are unhappy about the riser being on the means of
 22 escape — but as it is already installed not sure this
 23 will have any input."
 24 Now, we asked Ms Wray about this during her oral
 25 evidence and she said that the LFB were unhappy but they

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1 didn't say that it presented a risk, and she also said
 2 that she raised this with the LFB because Cadent were
 3 not responding to her on the point.
 4 Now, were you ever made aware of the LFB's
 5 unhappiness about the riser being on the means of
 6 escape?
 7 A. I was not personally made aware, no.
 8 Q. Now, I understand that you became personally involved in
 9 the project in around March 2017; is that right?
 10 A. Yes.
 11 Q. As we understand it, is it right that some time in
 12 March 2017, you were invited to attend a meeting with
 13 the TMO and Cadent to discuss these complaints about the
 14 original design? Is that right?
 15 A. I don't recall personally being invited to a meeting
 16 with the TMO.
 17 Q. Right, okay. But as far as we can tell, before any such
 18 meeting took place, the design was changed. Can you
 19 just tell us briefly what led to that change in design?
 20 A. So design 1, the pipe in the stairwell was of a welded
 21 and screwed construction.
 22 Q. Yes.
 23 A. It was meant to be welded and screwed. What was
 24 actually built or what was introduced into that
 25 construction was what we call a compression fitting, and

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1 that compression fitting was introduced into the
 2 pipeline at each of the branches onto the lobbies. So
 3 we went from a welded and screwed construction to a pipe
 4 with a different type of component in, which changed the
 5 requirements of ventilation. Therefore, we could no
 6 longer rely on the indirect ventilation down the bottom
 7 of the stairwell. We was okay with the direct
 8 ventilation at the top to natural air, but we needed to
 9 find a ventilation route to air at the bottom of the
 10 riser as well.
 11 Q. Right. You talk about a compression fitting; is another
 12 word or phrase for that a flanged joint?
 13 A. It is, yes.
 14 Q. Can you just explain what that means, flanged, rather
 15 than being screwed or welded?
 16 A. Yeah. So if you can visualise a straight pipe with a T
 17 piece, so we've got a welded T piece in, at the end of
 18 that T piece there would have been a thread, and that
 19 thread — the threaded valve would have screwed on to
 20 that piece of pipe that protruded out of the vertical
 21 pipeline.
 22 The flange fitting enabled us to put a fitting on
 23 and tighten it up as opposed to screw it or weld it. So
 24 by tightening it up, it creates a seal via a gasket
 25 which tightens it up. So there is no screwing or

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

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

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

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

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1 Q. Right.
 2 A. So we would have installed a ventilation point within
 3 the boxing in the basement.
 4 Q. So you were boxing—in — I'm not concerned about the
 5 basement because, as I understand it, the basement's got
 6 its own ventilation and is a ventilated space for all
 7 sorts of reasons, because it's got dangerous substances
 8 in it.
 9 A. Yes.
 10 Q. I'm really talking about the point from the top of the
 11 basement to the bottom of the stairs, those floors that
 12 you've got to get through. I still don't understand
 13 how — are you saying that you would create a boxing—in
 14 around that pipe all the way down —
 15 A. That's right, yes. The boxing—in would have been to —
 16 the design drawing — on the design drawing, it talks
 17 around fully boxing in, on design 2, all of the pipe.
 18 That would have included the pipe running through the
 19 cupboard, into the stair — into the riser cupboards.
 20 So it comes in, it comes down the stairwell into
 21 a storeroom, through a riser cupboard, through another
 22 riser cupboard and then into the basement and then out
 23 to the road. The design, the fully boxed—in design,
 24 design 2, to provide that ventilation, required the
 25 whole system to be boxed in as it run through the full

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

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

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

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1 the design change, and that's when design 2 became live,
 2 and that's when he override the design risk register .
 3 Again, the process of producing the risk register for
 4 design 2 still resulted in a risk score less than the
 5 required — the threshold, but Steve overrode that —
 6 Q. Yes, I'm coming to that.
 7 A. Okay.
 8 Q. I'll take you to those documents.
 9 What I'm getting at is that before that change was
 10 made on site, there should have been a design review,
 11 shouldn't there, to have assessed the consequences of
 12 changing to that flanged joint?
 13 A. Yes, they shouldn't have been introduced without
 14 a design amendment, we call it.
 15 Q. Let's look at that revised design in drawing form, if we
 16 can go to {TRI000001223}.
 17 This is effectively the same drawing that we saw
 18 before, but if we can zoom in on the middle box again
 19 with the lines, here the difference is, from the last
 20 design, that the solid black line is now going around
 21 the pipe all the way around the lateral; do you see
 22 that? So the bottom part which is in the stair —
 23 A. Yes.
 24 Q. — as well as the bit in the lobby is now boxed in; is
 25 that correct?

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1 A. Yes, the whole system would have been boxed in.
 2 Q. Yes, and the green pipe, that's the riser, that was to
 3 be boxed in as well, wasn't it, within the stairs?
 4 A. It was, yes.
 5 Q. So, actually, if this drawing were correct, we would
 6 have black lines around the green line as well.
 7 A. With this particular drawing, yes.
 8 Q. Yes. So we've now got boxing—in in the stair and the
 9 lobby, not just boxing—in in the lobby.
 10 A. That's correct.
 11 Q. Yes, thank you.
 12 It says in the red text at the bottom:
 13 "Boxing to be open ended into protected shaft to
 14 allow ventilation of the lateral pipework."
 15 So we have still got the oversized holes between the
 16 stairs and the lobbies to enable there to be ventilation
 17 across this boxing—in, but once it comes into the
 18 stairs, it's now in a confined box up to roof level; is
 19 that correct?
 20 A. That's correct, yes.
 21 Q. Yes.
 22 If we look at the photograph immediately above, we
 23 can see blue lines which show where the boxing—in is
 24 going to be built in the stair; is that correct?
 25 A. Sorry, can you just repeat that?

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1 Q. Yes, the blue lines in this photograph, they're showing
 2 where the boxing—in is going to be built in the stair .
 3 A. That's right, yes.
 4 Q. We've got these orange bars with the label "Intumescent
 5 vents", and in the text box it says — it's very blurry,
 6 but I'll read it out:
 7 "All pipework (riser and laterals up to flat entry
 8 point) to be boxed in to 2hr fire rated. Intumescent
 9 vents to be installed in stairwell only — Sleeved
 10 entries between stairwell and communal landings to be
 11 left unsealed within the boxing in."
 12 So taking that in stages, all the pipework was to be
 13 boxed into two-hour fire rated boxing; yes?
 14 A. Yes.
 15 Q. There were to be intumescent vents in the stairwell side
 16 only in this position; is that correct?
 17 A. That is, yes, that's correct.
 18 Q. And sleeved entries between the stairwell and the
 19 communal landings to be left unsealed, so the oversized
 20 holes are to be left as they are?
 21 A. That's right, yes.
 22 Q. Yes. And someone's highlighted, we can see, the
 23 "2hr fire rated" in yellow.
 24 Was it unusual to specify two-hour fire rated board?
 25 A. No, that was the standard. Where boarding was to be

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

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

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

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

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

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1 a moment {TRI000001223}, and look at this design 2 in
 2 the top of the stairs, we get no assistance from this
 3 drawing, do we, as to how the ventilation at the top was
 4 going to work?
 5 A. No, it's a very simple schematic drawing, so it doesn't
 6 show how the ventilation or the access to the roof would
 7 have worked.
 8 Q. No.
 9 Again, just to be clear, in this second design, we
 10 get no assistance in any design drawings or design
 11 documentation as to how it was going to work at top
 12 level, do we?
 13 A. Only that the boxing—in would have gone up to the roof
 14 vent, it would have extended into the roof vent and
 15 would have vented to atmosphere.
 16 Q. Yes, but we can't see a design for that at the top of
 17 the building, can we?
 18 A. No.
 19 Q. Similarly, you said before that there would be boxing—in
 20 at these lower levels, linking the top of the basement
 21 to the bottom of the stairs. Where do we see that on
 22 this drawing?
 23 A. It's not shown. It wasn't shown on a drawing.
 24 Q. How do you know that that was the intention of the
 25 second design?

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

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

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

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

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

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

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

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1 accessible at all for inspection, because they were
2 boxed in?

3 A. We do have something called an endoscope, which is in
4 effect an internal camera which can be introduced into
5 the pipeline to inspect it should need be, so there are
6 options around future inspection using that kind of
7 technology.

8 The access to the pipeline itself, in terms of what
9 I've referred to earlier on in terms of the breaking --
10 getting into it would have been for the proactive
11 element of it, so getting into the line valves that were
12 introduced so we could extend it and then reinstate the
13 boxing-in. But should there be a need to do some visual
14 inspection then, you know, pipelines are camera'd, there
15 is technology out there to camera.

16 Q. Yes.

17 A. That wouldn't have been a tRiIO activity, that would
18 have been Cadent's, under their inspection regime.

19 Q. Yes.

20 Did you ever think about whether the basement being
21 an area of special hazard made it unacceptable to box in
22 the utilities sections and treat them as being venting
23 in the basement? Was that ever considered?

24 A. No. So in terms of -- there's two different ways of
25 looking at design 1 and design 2. Design 1, the

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1 decision was taken that it was a pipeline and fittings
2 that were introduced into that basement and there was
3 ventilation within that for other -- there was the
4 10-inch gas supply to the boilers and various other
5 different utilities within there.

6 In reference to the second design, fully boxing that
7 pipe in, it would have been fully boxed in, so it would
8 have been segregated from the basement, in effect,
9 becoming its own compartment, and then it would have --
10 a vent would have been installed within the boxing-in to
11 outside to enable that.

12 Q. I see. So you would go through the basement with the
13 boxing-in to outside?

14 A. Yes.

15 Q. How do you do that? Haven't you got to go back up to
16 ground level again?

17 A. There would have been a route -- we would have had to
18 have found a route out to external. So that was --
19 reference earlier on around Express Builders going down
20 that to price that up and review that in terms of how
21 they would have achieved that. That was the next stage.
22 It hadn't been designed at the time in terms of how we
23 were going to achieve that.

24 Q. Right, I see. Yes.

25 Going back to inspection and maintenance, do you

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1 accept that it was a weakness in the design that so much
2 of it would be boxed in it would make it very difficult
3 to inspect and maintain, even though I know you've said
4 that there are ways you can sometimes get around that?

5 A. You know, the boxing-in was for ventilation. That is
6 a primary -- you know, that -- in terms of -- if you
7 have a hierarchy of what you're looking to achieve, it
8 was ensuring that it could ventilate, and then because
9 the boxing-in could have been -- the pipe could have
10 been exposed by cutting out the boxing-in, it was --
11 that was the way that we decided to do that.

12 Q. Yes.

13 Was there ever any analysis done as to whether the
14 holes in the walls through which the pipes passed were
15 big enough for ventilation purposes?

16 A. No, it was -- it would have been -- it was engineering
17 judgement on behalf of the designers, and it's custom
18 and practice that if you was putting a 2-inch pipe
19 through a wall, you would drill a 3-inch hole. That was
20 just general -- that was practice, years of experience
21 over -- but there was no design around that, there was
22 no calculations to support that.

23 Q. I think it follows from what you have said that there
24 was also no check that the ventilation of the riser from
25 the bottom to the top would be adequate as a complete

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1 system?

2 A. At the time of the design, there was no calculations to
3 support the design. Subsequent to that, I understand
4 some work has been done, but at the time it wasn't.

5 Q. Was there ever any consideration of the effect on
6 compartmentation of these oversized holes between the
7 stair and the lobby before the completion of the
8 boxing-in?

9 A. Sorry, could you repeat that?

10 Q. Yes. Was there ever any analysis of the effect on
11 compartmentation of the oversized holes between the
12 stair and the lobby before the completion of the
13 boxing-in?

14 A. The primary objective was we were trying to get gas back
15 on, so we left holes within the fire compartmentation
16 and therefore that presented a risk. So it was -- we
17 was aware of it, but it was -- the programme was in
18 terms of the priority to get the gas back on and then
19 follow up with the boxing-in.

20 Q. So you did actually ask yourselves the question: what
21 happens if we have a fire in this building before all
22 the boxing-in's been completed?

23 A. I personally didn't and I'm not sure the guys -- I can't
24 answer for them in terms of whether that was -- they
25 would have understood what they were doing. Clearly

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

9 Q. Yes.

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

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

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

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

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

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

14 Q. Yes.

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

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

25 A. Yes.

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

3 A. Yes.

4 Q. Corrosion?

5 A. Yes.

6 Q. Thermal expansion and contraction?

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

10 Q. Access for inspection and maintenance?

11 A. Again, yes.

12 Q. Valves, including access to them and security?

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

16 Q. Yes, thank you.

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

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

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1 Is that your understanding as well?

2 A. It is, yes, yes.

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

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

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

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

21 A. Yes.

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

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

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

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

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

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

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

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

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

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1 approached in terms of commissioning the pipe once
 2 everything else had been done, so therefore there was no
 3 gas introduced into the riser and no ventilation issues,
 4 then it could have been done in a sequence that wouldn't
 5 have breached — or you could have followed it through,
 6 but because it was a reactive, it was done maybe
 7 two months before, the commissioning was done two months
 8 before, and it left these bits to follow, therefore
 9 leaving a risk that we was following on from.
 10 Q. Yes.
 11 A. And that was the approach at the time, and that was the
 12 approach across the full MOB's programme, reactive MOB's
 13 programme. This wasn't specific in terms of — well, it
 14 wasn't different in the way that this job was done. It
 15 was, as I just explained, in terms of reactive works.
 16 Q. Right, yes.
 17 There are a few email exchanges between Cadent and
 18 tRiIO following this email. I just want to pick up on
 19 another one.
 20 If we can look at {TRI000001035}.
 21 This is an email from Stephen Johnson to Mary Ryan
 22 that same day, and he says:
 23 "Mary,
 24 "Let me re phrase the narrative below.
 25 "There is still work to do, tRiIO are aware of it,

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

5 Then he goes on and deals with other points.
 6 So he appears to be saying: look, we're aware of it,
 7 we know the work's not compliant at the moment, we're
 8 getting on with the work. And there, there's talk of
 9 being removed from site. Now, is that harking back to
 10 the asbestos incident where tRiIO had been removed from
 11 site for three weeks?

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

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

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

22 Q. Right, I see.

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

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

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

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

17 MS GRANGE: Yes, I understand, thank you.

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

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

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1 Well, now, Mr Dolan, I don't know how you feel,
 2 whether you need a break at this stage in the afternoon.
 3 The possibilities are that we continue now for another
 4 15 or 20 minutes and then have a break. We always have
 5 to have a break at the end of counsel's questions
 6 anyway, so to do that would lead to us having two
 7 breaks, though we're not short of time, so I think the
 8 question is whether you feel you would like a break at
 9 this stage.

10 THE WITNESS: I'm happy to proceed.

11 SIR MARTIN MOORE-BICK: Are you sure?

12 THE WITNESS: Yes, yes, absolutely.

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

15 THE WITNESS: Yes, will do.

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

18 MS GRANGE: Yes, thank you.

19 Some more questions about ventilation in the new
 20 design.

21 We've talked about these intumescent strips in the
 22 boxing—in. Now, were these intumescent strips ever
 23 installed?

24 A. No, they weren't.

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

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

7 Q. Right.

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

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

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

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

16 A. No, they weren't.

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

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

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

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

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

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1 fitting of being able to connect the modular bit in the
 2 lateral to the riser system. It was an easier way of
 3 doing that. It presented less problems.
 4 SIR MARTIN MOORE-BICK: Thank you.
 5 MS GRANGE: We saw earlier that there was a specification in
 6 the design for two-hour fire rated boards for the
 7 boxing-in.
 8 If we can go to your first statement at page 13
 9 {MET00012711/13}, that's your Met statement, here you
 10 have helpfully set out a table of all the materials that
 11 were used, and at the very bottom row on this page we
 12 can see it says:
 13 "Boxing in of pipework.
 14 "Enviroboard Fire Board — Uni Board 12mm."
 15 That's the fire boxing material, and then you've
 16 got:
 17 "88 minutes. Manufacturer's specification is up to
 18 2 hours."
 19 Now, just to be clear, was that the product used for
 20 the boxing in of the risers at Grenfell Tower?
 21 A. It was, yes.
 22 Q. Yes.
 23 If we go to the technical datasheet for these
 24 Enviroboards, that's at {TRI000001377}, this is
 25 specifically for this Uni-Board version of the

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1 Enviroboards.
 2 If we go to page 2 {TRI000001377/2}, there is
 3 a table at the top with British and European test
 4 results, and if we look at the fifth row down for
 5 BS 476-22, which are the relevant tests, we can see the
 6 12-millimetre board achieved 65 minutes insulation and
 7 88 minutes integrity. Do you have that?
 8 A. I do, yes.
 9 Q. Then at the bottom of the first page {TRI000001377/1},
 10 there is a table, and it says:
 11 "Technical DATA 12mm Up to 2 Hour Rated Fireboard."
 12 Do you see that there?
 13 A. Yes.
 14 Q. Now, saying it's an up to two-hour fire rated fire board
 15 isn't the same as saying that this board has
 16 a fire resistance of two hours, is it?
 17 A. That's correct.
 18 Q. And the board only had 88 minutes of fire resistance
 19 integrity, didn't it?
 20 A. It did, yes.
 21 Q. So the board that was used did not follow the
 22 specification in terms of fire resistance; is that
 23 correct?
 24 A. Yeah, it wouldn't have been compliant with the
 25 requirements of two hours.

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

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

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1 SIR MARTIN MOORE-BICK: All right? And please don't talk to
 2 anyone about your evidence while you're away from the
 3 room.
 4 THE WITNESS: No.
 5 SIR MARTIN MOORE-BICK: Good, thank you very much.
 6 (Pause)
 7 3.35, please.
 8 MS GRANGE: Thank you.
 9 (3.20 pm)
 10 (A short break)
 11 (3.35 pm)
 12 SIR MARTIN MOORE-BICK: All right, Mr Dolan, ready to carry
 13 on?
 14 THE WITNESS: Yes.
 15 SIR MARTIN MOORE-BICK: Good, thank you very much.
 16 Yes, Ms Grange.
 17 MS GRANGE: Yes, thank you.
 18 Yes, before we broke off we were discussing the
 19 location of the meter in the flats, and the fact that
 20 the meter position had to be moved to nearer the front
 21 doors because of the new riser replacement programme.
 22 Can we just look at IGEM/G/5, second edition, on
 23 this. That's at {RHX00000005/38}.
 24 If we go to 5.2.3 at the bottom of the page, we can
 25 see it says:

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1 "Siting meters with respect to sole escape routes
 2 within individual dwellings."
 3 Then below that, 5.2.3.1, it says:
 4 "If it is proposed to install a meter in a sole
 5 means of escape within an individual dwelling, either:
 6 " ■ the meter shall be enclosed in a box, cupboard or
 7 other compartment (which may open onto the sole means of
 8 escape from within the individual dwelling) which is at
 9 least 30 minute fire resistant to BS 476 and which has
 10 a self-closing door, or
 11 " ■ the pipe immediately upstream of the meter
 12 installation, shall be provided with a TCO."
 13 Can you just help us, what is a TCO?
 14 A. That's a thermal cut-off valve.
 15 Q. Can you just explain what the function of that is?
 16 A. Yes. It will automatically close when the temperature
 17 in that location gets to a certain level.
 18 Q. Right, yes.
 19 As we understand it, it was permissible by this
 20 technical standard to put the meters in a sole means of
 21 escape, provided they are either in this fire rated
 22 cupboard, at least 30 minutes fire resistant,
 23 self-closing door, or the pipe has to have this thermal
 24 cut-off device fitted; is that how you understand that
 25 part of IGEN/G/5 guidance to work?

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1 A. It is, yes.
 2 Q. Does it follow from the answers you gave before we broke
 3 off that tRiIO did not consider this part of IGEN/G/5 to
 4 be engaged for the Grenfell Tower project because these
 5 meters were not being installed in the sole means of
 6 escape but just close to the sole means of escape?
 7 A. That's correct, a room that connected to the sole means
 8 of escape.
 9 Q. Right. So did tRiIO actually consider this point,
 10 consider whether this provision applied, and reject
 11 that, or are you making an assumption that that must
 12 have happened?
 13 A. No, we did consider it and it was rejected.
 14 Q. Right.
 15 Now, it doesn't appear that any TCOs, thermal
 16 cut-off devices, were installed for these repositioned
 17 meters; is that correct?
 18 A. That's correct.
 19 Q. Nor were there any self-closing doors on the meter
 20 cupboards; is that correct?
 21 A. That's correct.
 22 Q. Nor is there any evidence of the cupboards having at
 23 least 30 minutes' fire resistance; is that correct?
 24 A. That's correct.
 25 Q. Is the explanation for that simply that you didn't think

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1 this applied?
 2 A. We didn't consider it to be a box cover or
 3 a compartment, it was considered to be a room connected
 4 to the sole means of escape.
 5 Q. So you mean that the cupboard into which the meter went,
 6 you thought that was a room connected to the sole means
 7 of escape?
 8 A. It was — yeah, the designer's determination was that it
 9 didn't fall into this requirement.
 10 Q. Right.
 11 Let's just have a look at an image at {MET00016651}.
 12 This is an image taken by the Metropolitan Police of
 13 flat 22, which is on floor 5. Here we can see the meter
 14 in this alcove. Do you see that?
 15 A. Yes.
 16 Q. I think we can agree that's not a self-closing cupboard,
 17 is it?
 18 A. No, it's not a self-closing cupboard.
 19 Q. And, by definition, not 30 minutes fire resistant.
 20 A. In terms of the designer's determination is that was
 21 considered a room.
 22 Q. Right. I see.
 23 I want to ask you briefly now about valves, and
 24 starting with pipeline isolation valves, PIVs.
 25 We heard yesterday from Mr Harrison that Cadent

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1 believed that a pipeline isolation valve, a PIV, was
 2 installed in the ground on the east side of
 3 Grenfell Tower in the gas pipes supplying residential
 4 supply 2. Is that something that you can confirm?
 5 A. That's correct, yes.
 6 Q. So a PIV was put in there?
 7 A. A PIV was installed, yes.
 8 Q. Now inlet isolation valves.
 9 When the service pipe for residential supply 2 comes
 10 into the basement, it enters at height, around 4 to
 11 5 metres from the floor; is that correct?
 12 A. It is, yes.
 13 Q. And it travels along the ceiling until it comes up
 14 through the building. We've seen that in the
 15 photographs.
 16 We don't have any design from tRiIO about how the
 17 pipe layout and installation in the basement should have
 18 been designed. All we've seen is the photographs marked
 19 up by Simon Boygle which I showed you earlier.
 20 Are you aware of anything else that tRiIO did in
 21 terms of that design?
 22 A. I'm not.
 23 Q. No.
 24 Would tRiIO typically produce a detailed design of
 25 the pipe layout in the basement?

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1 A. Not ... in terms of — no, not that I'm aware of.
 2 Q. Was it just left up to the installers to put in the
 3 service pipe in the basement in whatever way they saw
 4 fit?
 5 A. It would have been a — yeah, an interactive process
 6 where the designers were talking to the pre-construction
 7 team, were talking to the subcontractors, so there would
 8 have been constant dialogue and agreement, and it was
 9 an iterative process in terms of the survey being
 10 undertaken into design, a design produced, a design
 11 drawing, which was the GASWorks9 drawing, as you can
 12 see, and then there would have been dialogue, there
 13 would have been a project pack created, and the details
 14 of the route of the pipeline within the basement and
 15 throughout the rest of the building would have been part
 16 of that process.
 17 But I'm not aware of a specific detailed design
 18 drawing that was available to — that covered that
 19 route.
 20 Q. Yes, I see. I think from that answer what you're saying
 21 is it would have been determined on site in dialogue
 22 with the subcontractor and tRIIO?
 23 A. Yes.
 24 Q. Now, we know that a valve was installed in the pipeline
 25 of residential supply 2 once it came into the basement.

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

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1 The reason for not installing a ladder is (a) it's
 2 open to other people to use. It would need to be
 3 inspected on a regular basis to maintain its integrity,
 4 and therefore the decision was taken that it's better
 5 and safer to do it in the way I just described as
 6 opposed to putting something there that people could
 7 access and the issues around inspection and maintenance.
 8 So it was never the intention to put something there
 9 for constant use because it was a planned frequent —
 10 a frequency around when it would be used.
 11 Q. Right, I understand, thank you.
 12 Can we go again to IGEM/G/5, {RHX00000005/43}.
 13 At the bottom of the page, paragraph 6.1.17, this
 14 says:
 15 "Consideration shall be given to the provision of
 16 a line diagram at each building entry/IIV, depicting the
 17 dwellings served by that particular network pipeline."
 18 Now, is it your understanding that it's good
 19 practice to provide a line drawing at the IIV point?
 20 A. My understanding of that is around the diagram from or
 21 the drawing from the pipeline into the PIV into the
 22 building which would show the IIV. I'm not aware of any
 23 other line diagrams being produced showing internal
 24 pipework and the associated valves.
 25 Q. Right, okay.

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1 Now, just stepping back for a moment, we have been
 2 through a lot of different aspects of the design and the
 3 construction today, and looking at matters in the round,
 4 can we agree that, overall, the design work that tRIIO
 5 undertook at Grenfell Tower did not contain sufficient
 6 detail about the following things:
 7 It didn't contain sufficient detail about how the
 8 ventilation would be achieved in all the laterals along
 9 the whole height of the riser.
 10 A. Yes.
 11 Q. It made no provision for ventilation through the floors
 12 once the riser boxing—in was completed.
 13 A. I don't agree with that.
 14 Q. How about it made inadequate provision for ventilation
 15 through the floors once the riser boxing—in was
 16 completed?
 17 A. The ventilation wasn't supported by calculations,
 18 I think is the ...
 19 Q. Can we agree there wasn't any detail in the design on
 20 how natural ventilation would be achieved in the
 21 basement or at the top of the building?
 22 A. That's correct, yes.
 23 Q. And can we also agree that the designer does not appear
 24 to have approached any Building Regulation or fire
 25 expert with regards to understanding or mitigating the

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1 impact of breaching the compartment through the stair
 2 walls?
 3 A. Yes.
 4 Q. Now, in those circumstances, would you accept that
 5 tRiIO's design work lacked thoroughness?
 6 A. I think there were elements of it that could have been
 7 improved or should have been improved, yes.
 8 Q. Do you agree that tRiIO should have taken more active
 9 steps to assure itself that its contractors and
 10 subcontractors were coming up with a safe and compliant
 11 design?
 12 A. Its contractors producing a design or tRiIO producing
 13 its design? Can you just clarify that for me, please?
 14 Q. Let's say tRiIO producing the design.
 15 A. Yes, we — again, you know, in terms of what was
 16 produced and what was shared with the supply chain, the
 17 contractors, there was definitely improvements to be
 18 made in terms of that information.
 19 Q. Yes.
 20 When we spoke about this earlier, you said that
 21 there was an audit regime for the design in place and
 22 there were three tiers of audits that were undertaken on
 23 all the works that were delivered.
 24 Can you explain how that audit regime didn't pick up
 25 the design problems that we've just been identifying?

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1 A. So the audit is not around the design. There is
 2 an inspection regime on the operational activities
 3 undertaken. So our site manager would have had
 4 a requirement to do a number of inspections on site. We
 5 would have expected our contractors and subcontractors
 6 to undertake their own inspections of their work. We
 7 had the client undertaking assurance checks on site, and
 8 also our health and safety team would have gone to site
 9 and undertaken —
 10 Q. I see.
 11 A. — inspections.
 12 In terms of — in reference to the introduction of
 13 the non-compliant flanges, that should have and was not
 14 picked up by our site manager. It was subsequently
 15 picked up by the client audit, Pat Kelly's audit, and
 16 that was communicated to Steve Johnson and then that was
 17 addressed, as you've seen earlier on, around the design
 18 amendment and the change in design in terms of the
 19 boxing-in and around ventilation.
 20 Q. Yes, I see.
 21 In terms of the construction work, can we agree that
 22 tRiIO's contractors and subcontractors failed to install
 23 the welded joints and put in flange joints instead?
 24 A. Yes.
 25 Q. Failed to install boxing-in with two-hour fire rated

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

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

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1 MS GRANGE: If we could perhaps have a ten-minute break,
2 I think that would be sufficient for questions.
3 SIR MARTIN MOORE-BICK: Or thereabouts, yes.
4 Well, Mr Dolan, as I indicated earlier, when counsel
5 gets to the end of her questions, we have to have
6 a short break to enable her to check that nothing's been
7 left out, and also to let other people who aren't
8 physically present suggest questions which perhaps we
9 should be putting to you.
10 THE WITNESS: Yes.
11 SIR MARTIN MOORE-BICK: So we'll have a break now. We'll
12 come back at, I think, 4.05.
13 MS GRANGE: Thank you.
14 SIR MARTIN MOORE-BICK: And at that point we'll find out if
15 there are any more questions for you. All right?
16 THE WITNESS: Okay.
17 SIR MARTIN MOORE-BICK: Again, please don't talk to anyone
18 about your evidence while you're out of the room. If
19 you would like to go with the usher, she'll look after
20 you, and we will see you in a moment.
21 (Pause)
22 4.05, then, please.
23 MS GRANGE: Thanks.
24 (3.52 pm)
25 (A short break)

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1 (4.05 pm)
2 SIR MARTIN MOORE-BICK: Right, Mr Dolan. Well, we'll see if
3 there are any more questions for you.
4 Yes, Ms Grange?
5 MS GRANGE: No, there are no further questions, Mr Chairman.
6 I would just like to thank Mr Dolan for coming here
7 today and assisting us with our investigations. It
8 really is appreciated.
9 THE WITNESS: Thank you.
10 SIR MARTIN MOORE-BICK: Yes, and I would like to thank you
11 very much, Mr Dolan, on behalf of all three members of
12 the panel. It's always very helpful and indeed very
13 interesting for us to hear from people who were actually
14 involved and had first-hand knowledge of what was going
15 on.
16 I would really like to say as well how grateful we
17 are for your candour in describing the events and
18 responding to the questions that we put to you. It's
19 been extremely useful and we are very grateful.
20 THE WITNESS: Thank you.
21 SIR MARTIN MOORE-BICK: So thank you very much, and now you
22 are free to go.
23 THE WITNESS: Okay. Thank you.
24 SIR MARTIN MOORE-BICK: Thank you very much.
25 (The witness withdrew)

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1 SIR MARTIN MOORE-BICK: Yes, Ms Grange, now then.
2 MS GRANGE: Yes, thank you. So we have nothing further for
3 today, and tomorrow we will be hearing from our gas
4 expert, Mr Hancox.
5 SIR MARTIN MOORE-BICK: Yes, good, thank you very much.
6 Well, in that case, we'll break there for today and
7 we'll resume tomorrow morning at 10 o'clock.
8 MS GRANGE: Thank you.
9 SIR MARTIN MOORE-BICK: Good, thank you very much.
10 10 o'clock tomorrow, then.
11 (4.07 pm)
12 (The hearing adjourned until 10 am
13 on Wednesday, 14 July 2021)
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