Independent Committee in relation to the fire at Wang Fuk Court in Tai Po

Evidential Hearing

The Honourable Mr Justice David Lok
The Honourable Mr Chan Kin-por, GBS, JP
Dr Rex Auyeung Pak-kuen, GBS, JP

On:
Day 27
Thursday, 25 June 2026

Mr Victor Dawes SC, Mr Jason Yu, Mr SW Lee, Mr Jonathan Fung and Mr Brian Lee appeared on behalf of the Independent Committee

Mr Calvin Cheuk SC, Mr Jenkin Suen SC, Mr Charlie Liu and Ms Vivian Woo appeared on behalf of the Government

Mr Ross Yuen appeared on behalf of the Urban Renewal Authority

Representatives of Department of Justice

Representatives of Competition Commission

Mr Richard Khaw SC appeared on behalf of ISS EastPoint Properties Ltd.

Mr Jeffrey Tam and Mr Andrew Lau appeared on behalf of residents of Wang Fuk Court

Mr Jonathan Kwan and Mr Aaron Chan appeared on behalf of Leung Ping Kay

Representatives of Victory Fire Engineering Limited

Representatives of Hop On Management Company Limited

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(10.00 am)
THE HON MR JUSTICE DAVID LOK: So Mr Dawes, this part will be conducted in English; is that right?
MR VICTOR DAWES: Yes, chairman, and we have Prof Usmani and Prof Jiang with us this morning.
Professor, can I trouble you to read out -- there should be a statement in front of you. I think you can do it one by one.
(10.00 am)
PROF ASIF SOHAIL USMANI (affirmed)
MR VICTOR DAWES: Thank you.
And Prof Jiang.
PROF JIANG LIMING (affirmed)
Examination by MR VICTOR DAWES
MR VICTOR DAWES: Thank you.
Thank you very much for assisting the Committee in the investigation of this tragic incident. I've already outlined your experience, professional and academic experience, a couple of days ago when we introduced the evidence so I won't sing your praises again if you don't mind.
Apart from the expert report that you have filed, we have filed on your behalf, chairman will note there are some minor corrections in bundle ER8, mainly just some

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typographical or clerical errors. I understand that those are the corrections that you would like to make.
I understand that the two of you would like to present your expert evidence and you will take turns, each of you covering different parts of the report. So without further ado, can I pass the conch to Prof Usmani.
PROF ASIF SOHAIL USMANI: Yes. Thank you, counsel. So I will go first and I will introduce our findings.
This is just -- I think probably introductions have been made but we are both professors at Hong Kong Polytechnic University, both working in the fire safety engineering area doing research and teaching. Before we do anything else, we'd like to take this opportunity to say that as researchers in the field of fire safety engineering, we believe that we are tasked with the investigation of fire hazards, informing the public and ultimately mitigating the risk of lives lost to preventable fires. As such, we deeply lament that the tragedy was not averted and we wish to express our deepest sympathies and sorrow over the tragic casualties at Wang Fuk Court.
We would also like to pay our tribute to senior fireman Ho Wai Ho for his selfless sacrifice in the course of his duties.

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So the objectives of this report assigned to us, this task, by the Independent Committee, were to examine and detail the mechanisms and pathways of fire and smoke spread within Wang Fuk Court and provide expert analysis to support the Committee's findings and recommendations.
The terms of reference gave us this scope of work, analysing the rapid vertical and lateral spread of fire along the external walls, conducting a detailed fire and smoke spread analysis; analysing the ignition and combustion behaviour of building materials on the external walls, including scaffolding nets, foam boards, et cetera; reviewing existing fire safety standards and accessing their adequacy; conducting independent tests on relevant building materials and analysing their fire spread characteristic; identifying and commenting on recent technological developments that may assist firefighting.
So just for the benefit of the audience, the public, I would like to give you some context, some background on the fundamentals of fire safety engineering, some of the basic ideas which perhaps may have been covered indirectly but this would be a little bit more sort of like what students and firefighters, et cetera, go through, some of the basic information.
So for a fire to exist, there must be three

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components, three things present. It is referred to as the fire triangle. These three things are fuel, heat and air, which basically obviously is the oxygen part of the air. When these three things combine, like in the lit match picture, the fire starts with these three things and the fuel degrades and this fuel is the wood of the match, it degrades and then it releases pyrolysis gases and these combustible gases are released because of the degradation from the material from the heat, and that creates the fire.
This is a necessary condition for fire to exist. But for the fire to sustain over a long period of time, we have a further sort of slightly refinement of this idea. There are the three components, the fuel, heat and oxygen but you also need some sort of a chain reaction which allows the fire to sustain. So this is a necessary condition for fire to sustain. So basically the diagram on the right from a famous book of one of our colleagues in Edinburgh University, he -- you can see here that the -- there's some material here, this is solid material and it ignites and then it -- a fire starts and the fire then provides heat to the surface of the fuel and some of that heat is lost, so these arrows are showing the losses, and some of it is absorbed, so those go into the solid and then the solid begins to

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degrade and begins -- and the pyrolysis process starts and the pyrolysis process basically uses some of the mass of the solid, these big solid arrows show that mass is converted into pyrolysis or combustible gases and those gases burn. So this is a chain reaction that starts. And as long as we have more pyrolysis products produced, then the heat lost, then we can sustain the reaction. The reaction will not be sustained if there is not enough pyrolysis products produced and more heat is lost.

That's some of the basic ideas.

So in terms of development of a fire, typically, in most cases, fires happen in rooms, in compartments. So this is one of the ways that we kind of teach students to say that -- because the fires that we are interested in in terms of safety are mostly indoor fires, so fires that happen inside buildings or houses, and in that situation we may have some sort of an incipient phase where you have some smouldering or some small fire which is not being discovered and then it begins to flame and grow and growth phase can last for a period and then suddenly it changes into an all-over-room encompassing fire and this phenomena is called flashover.

This flashover fire then lasts for a period of time until the fuel is exhausted or the air is exhausted. So

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if your compartment doesn't have sufficient ventilation then the fire will die down or decline, but may still have sufficient fuel vapours which are unburnt.

So once the fuel has been completely consumed then the decay phase starts and the fire -- then the room cools down.

In Wang Fuk Court, because there were many fires in many compartments, so all of these situations would have occurred.

This is a graphical representation of what I just said. This is the incipient phase initially, which is not very high temperature, not much heat released, but it's just -- there's a fire that's kind of just growing. And then it reaches some flaming stage and this flaming stage then creates smoke and it builds up into the compartment ceiling cavity and it radiates to objects far away from the seat of the fire and this radiation can be quite strong and it will start igniting materials there, and then the flashover happens at a very short period of time and it lasts until the fuel loss and then the decay phase starts.

So this is typically -- so I will run this video that shows -- I hope this works.

(Video played)

So you can see there this is a NIST, National

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Institute of Standards and Technology, in the USA, they just did a demonstration test of a room where you have two -- actually there is some commentary there, but I can carry on.

So the fire starts from that corner location and you can see the smoke collecting on the ceiling and the smoke width, the depth of the smoke keeps increasing, the more it increases and the higher the temperature it is, over time it becomes a very effective radiator and it radiates to other materials, so that this paper started flaming because of that radiation and at some point the whole compartment becomes consumed with the fire. That's the flashover stage.

So basically this flashover occurs because the thermal feedback -- so if you see a fire in the open, the open fire will just lose heat to the atmosphere. There won't be any heat coming back to it. But if the fire is inside a compartment, inside a room, the heat comes back to it because the room absorbs the heat, the walls absorb the heat, and the feedback comes in and the feedback through the walls and through the smoke that develops, that increases so it's kind of a resonance effect. And this suddenly goes into a peak and that's flashover.

So it's basically a big difference between open

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fires and enclosed fire, confined fire.

Here the ventilation, the fresh supply of air, is a key controlling parameter. And ventilation, as I mentioned earlier, if it is limited, then the fire may die down but that doesn't mean that there isn't fuel there. So if suddenly somebody opens a window or breaks a window, like a firefighter or somebody, then suddenly a lot of air rushes in and it mixes with the fuel and you can have a very explosive incident, which is called a backdraft.

The next slide shows you firefighters in training at the Fire and Ambulance Services Academy in Tseung Kwan O, they are training for backdraft. So you see they opened the door, there was no fire, and then suddenly the air rushes in and there is a jet of fire coming out. So this is actually another critical event like the flashover. This is one of the most dangerous hazards firefighters face and they have to train for it and recognise the conditions where, say if they enter a building, if they recognise a condition, they don't run into a backdraft.

I'm mentioning these things because these are well-known critical events that people train for, firefighters train for, students understand, but there are other critical events happen which are probably not

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so well-recognised, like things that happened in Wang Fuk Court. So that is an external fire. We were talking about internal fires before.

Now, if we talk about external fires, there are two main aerodynamic, thermodynamic phenomena happening. There's a chimney effect in the cavities, which we saw in Wang Fuk Court, which is the re-entrant area, where you can have, what we saw, a very rapidly developing fire reaching very high temperatures for very short period of time, burning all the fuel very quickly. And then there's -- when you don't have -- in a normal building, where you don't have scaffolding, et cetera, outside, so if a compartment has a fire, the compartment goes into a flashover and it may break the window and the flames would leap out of the window and those flames then may stick to the wall above and may then break the window on the compartment above. So the fire could travel from one compartment to another compartment, which also happened in some cases in Wang Fuk Court, I think.

So this is the second one.

At this point I'd like to sort of emphasise that Wang Fuk Court was strictly not the first instance of this kind except for the magnitude. Three of them are very well known. There may be many more which are not

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so well known. They're well known because they are obviously high casualty events.

So the first one happened in Hong Kong; 1983, 31 deaths, Garley Building, it's very famous -- sorry. First one is Kings Cross. The first one is Kings Cross, 1987, 31 deaths. This was a very severe event where in London they used to have wooden escalators and the balustrades were also made of wood and they were varnished, et cetera, so that kind of is obviously fuel, and over a long period of time a lot of leaves and stuff accumulated, rubbish accumulated also under the escalator, and once it caught fire through maybe some cigarette or something, and this fire basically is supposed to be -- before that, it was assumed that fire would just basically rise, be vertical, be high, but this fire basically just hugged the escalator and just rushed up into the ticket hall above very quickly and overwhelmed the people there, resulting in 31 deaths.

This is essentially, to me, it's a bit more complicated than that, but you can consider it similar to the Wang Fuk Court chimney, you can think of it as an inclined chimney, it's called the trench effect. So actually, the colleague's picture there, showing Prof Drysdale, he was involved in this investigation, and he named it the trench effect, which is essentially like an

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inclined chimney. You can also see the walls of the -- the escalator has obviously side walls, but you also have an enclosure of the tunnel-type covering, circular, which is again like a chimney. So it's like a similar sort of effect.

Then Garley Building, which I mistakenly referred to earlier, this happened in 1996, so again nine years later, 41 people died. In this case, lift well fire caused by welding sparks during renovation. Again a chimney-type effect and that led to significant changes in regulations, mainly related to not just lift wells but generally also. It caused accelerated vertical spread.

Then Grenfell Tower is more recent, 2017. This basically had happened because cladding was installed which was supposed to be fire-retardant or fire-resistant, but it turned out not to be, and this cladding was connected to the building and there was a gap between it. So the gap was instrumental in the fire, so once one of the -- one of the apartments, the fridge caught fire and the flames came out and those flames then started deforming the aluminium covering and the internal polystyrene type of material caught fire and then it started to spread, and it spread through the spaces between the cladding and the building.

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It was not as fast as the Wang Fuk Court situation because it's a gap so small, but it still reached a maximum speed of about 8 metres per minute.

So, to me, it looks like a failure to connect the dots and see that phenomena as kind of happening repeatedly but people are not connecting the dots to see that this should perhaps be looked at as a more common and general thing that we should be looking at in our regulation of fire safety.

So this is just a picture which we won't dwell on because I think many people have covered it. It just shows we looked at the compliance of Wang Cheong House to the regulations and we feel that it did fulfil the BD CoP 1976 regulations except it had only one fire door. The requirement was two. But this didn't matter in this case because the fire came from the outside, so I won't go through that. I think my colleague will cover more on that.

The other thing is that I had -- I put some slides on timeline analysis for fire evacuation, but Dr To yesterday did that in quite detail. So basically there are these two ideas: the available safe egress time and the required safe egress time, and the required safe egress time should be less than the available safe egress time, which in the case of Wang Fuk Court -- so

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this is just explaining the same thing so I won't go through that because Dr To did that.

But if you look at Wang Fuk Court situation, then certainly -- especially Wang Cheong House, this basically does not really apply because there was basically zero available safe egress time. People just did not have the -- the evacuation routes were blocked even before people had the chance to move.

So I think this is now -- I think I will hand over to my colleague for a bit more detailed analysis.

PROF JIANG LIMING: Thank you, I'm Liming Jiang. I did work on this fire spread analysis of Wang Fuk Court, the smoke and fire spread.

My primary work is to restructure the fire spread at Wang Fuk Court. I apologise that there might be some heartbreaking videos and photos shown in my slides. I will go quickly. In the meantime, it's a heartbreaking kind of process for me because when I have to also go through all these post-fire photos.

This one is an introductive summary of the Wang Fuk Court fire. We have repeated many times that it was -- when it was initiated and there is intense re-entrant fires that later on developed into multi-unit room fires. This is a video.

(Video played)

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A short video but it shows the critical event that is the re-entrant fire, and particularly note that the time stamp of this video now is 16:11. You see the initiation of the re-entrant fire. And it quickly developed to the top roof. So that is like the peak time of the re-entrant fire.

Basically, from my analysis, I think the re-entrant fire is very typical and dominant fire behaviour, actually like recurred in different buildings at different re-entrants of the different buildings, and it produced high-intensity heat flux or heat boundary conditions but over a short period. Why I say so, because you see now it's 16:11, and it has somehow entered the decay stage of the re-entrant fire. It's only, like, two to four minutes of the peak time. And you see it's -- now the flames actually already decayed in a re-entrant area.

During this short period actually all the glass windows have been broken by the re-entrant, the very intensive re-entrant fire, and also later on caused smoke filling the buildings. Like, all of the room units that were affected by this re-entrant fire, you see large amount of smoke will be generated by -- like, after the re-entrant fire because the fuel collapsed and then there's insufficient combustion, generating a lot of smoke.

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Then basically I derived this kind of development fire, development history among the various buildings but in a similar pattern. It is initiated by ignition of the building facade material and that will initiate a massive vertical re-entrant fire that we just see, and that follows by the window glass breakage and ignition of the room units which was directly exposed to the re-entrant fire, and then the subsequent fire spread.

So vertical fire spread because of the remaining facade material and also the ejecting flames from the fully developed rooms afterwards and also there is fire spread to the adjacent units, so the lateral spread. That's why you see that the multi-room fires in multiple building blocks, actually the locations of the fires varies for a very long period.

On the right-hand side, that is the least of the peak time of the re-entrant fires we actually already showed it before. For block F I would like to go with details because it was already mentioned for many times.

For the spread or the transitions of the re-entrant fires at block F and block E, we believe -- because if you see the peak times, actually it's from, like, 14:58 to 15:02, so you see at the ground there is clear kind of fire spread at the ground level which is not actually

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due to the dripping flames but it's due to the spread of the ground fire, the combustible items that have been ignited and quickly spread from one re-entrant to another re-entrant, and also similar to block F to block E. These two buildings caused most of the deaths.

For block F, it's another re-entrant fire. That's why I kind of divided the whole development history from F1, that represents the first re-entrant fire of block F, second, and third. For block E also there were three re-entrant fires in block E, and in block C there were three re-entrant fires, and block B, G and A, these buildings only had a single re-entrant fire but at a very late stage; it's actually after 16.

So also we have this, like, damage map that shows the distribution of the fire-induced damage in these units, but you clearly see the green colour represents lighter fire damage and you see the correlation between the re-entrant fires and the post-fire damage of these units.

Actually when you investigate or analyse the damage levels of these units, you can clearly see there are two patterns. So I actually categorise them as type A room units and type B room units. The type A room units, when it is faced to the re-entrant fire, there is a living room, a window, a large area window facing to

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the re-entrant fire, directly exposed to the intensive re-entrant fire, and for the type B room units, the kitchens are the same so they all are exposed to the re-entrant fire directly and also there are some windows in the corridor. For the living rooms, they are not exposed to the re-entrant fire. The side window of the main bedroom of the type B units actually are subjected to the extended re-entrant fire.

So these damage patterns, I will not show it in detail, but actually that shows -- what we found, the fire was not actually spread from the kitchens, it's from the living room. And here, this shows the patterns or how many glass windows have been broken by the re-entrant fire. Actually almost all of the glass windows. This leads to the damage pattern -- this one is the type A room units. Later on we will see the type B room units.

For the typical damage patterns, these are heartbreaking photos and it actually show the different levels. It's a fully developed fire and also the localised fire and some room units do not have fire.

For the type B, here -- if you allow me to get back again, for type A, you see how many red colours, red indicating fully developed fire; and for type B, it's a lot of blue colour, representing no fire damage in these

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rooms except the localised fire in the kitchens. It clearly shows two categories of the room units.

After re-entrant fire, as I said --

THE HON MR JUSTICE DAVID LOK: Professor, can we go slowly? I know you are trying to pass through the slides quickly without we seeing too much of the -- but can you explain two sides. So this side is the type B?

PROF JIANG LIMING: Yes.

THE HON MR JUSTICE DAVID LOK: Less damage. So the type B is actually -- what is the difference between type A and type B?

PROF JIANG LIMING: Maybe I go back to this slide.

THE HON MR JUSTICE DAVID LOK: Yes.

PROF JIANG LIMING: So here, this is a type A room units. This is the living room. And there is a window, like a large area window, of the living room and it's faced to the re-entrant fire, it's very close to the re-entrant fire.

During the re-entrant fire, actually the video shows not only the fire flames inside the re-entrant but also extended flames in this large yellow area, these caused the glass breakage of the living rooms. From our analysis, this glass breakage, the glass breakage of the living room windows dominated the fire spread behaviour in the room units. As the later slide shows, there are

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two different damage patterns or the levels between the unit B and unit A.

For the unit B, you see the living rooms are actually facing -- not facing the re-entrant fire but only this window, there is a window here, it's a side window of the main bedroom. The side window of the main bedroom, they have minor damage. Normally we see the cracks, not just fall out. And also the ignition is not very intense. Some of the rooms of these units remain intact. There is no fire actually ignited by the extended re-entrant fire.

And here, also they share the same layout for the kitchens but there are different levels of damage that indicates that the fire is not actually spread -- was spreading from the kitchens because also, when I tried to kind of go through quickly the photos, these photos actually show how the fire spread in a unit not by the kitchen but in the living rooms.

THE HON MR JUSTICE DAVID LOK: So I think the conclusion or the observation is that because type A has more exposure because of the windows breakage.

PROF JIANG LIMING: That's right.

THE HON MR JUSTICE DAVID LOK: Of course the kitchen, they have the same configuration for both, but because for the kitchen, at least you have to get past the kitchen

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in order to go to the living room. So because the type B has less window exposure in the living room, so the damage there was relatively less serious than that of type A?

PROF JIANG LIMING: Yeah, because for the fire spread in the room units, normally it's -- ignition of some items that was easily to ignite, like the cotton, like sofa and stuff. But in the kitchen, especially near the window, you don't have the combustible items near the window in the kitchen. You wouldn't put, like, any kind of combustible items near there. That's why, from the photos, from the evidence photos, you only see kind of explosive loading impacting in the kitchens but do not ignite the kitchen. And also, for many windows -- many photos of the kitchens we see, the wooden furniture remain.

So that's a clear index for us we do investigation, we actually see like how much of the damage, how much of the burning of the wooden furniture that indicates. Because wood actually burns at, like, the temperature around 300 Celsius. So if it goes over that, you will see the charring of the wood furniture. If it's below that, that's only smoke or even there's no smoke, so that is clear index. And also melting of the plastics. This shows the temperature levels.

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THE HON MR JUSTICE DAVID LOK: I think we got your point.
PROF JIANG LIMING: Thank you. So these are the -- so actually here, if I stop here, this is melting of the plastics and also in this kitchen, the wooden furniture and here, from the living room corridor, the hallway, so the furniture remained because that means the fire is not spreading from the kitchens to the living room.

For the type A, it shows the different damage levels, as I mentioned here, and here, for the 1505, there's no fire in this room but also there is a complete fallout of the glass windows. From that actually, the only reason is the re-entrant causing full glass breakage.

And for this type B, as I mentioned, you clearly see here the main bedroom, the side windows is only -- the glass fall out or some windows only the glass breakage, not -- and here, the kitchen are the same, shows very intensive heating and other areas, living rooms and bedrooms, you could not see the fire.

For the summary of type B, you see the unaffected room units. The number is 18 units have no fire in living room and bedrooms, but -- there are many more than that, and seven units of fully developed fire.

That is during the re-entrant fire. So, for us, it's also -- we do not have this kind of experience of

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such intensive fire and in such short period causing the severe damage. Later on, after re-entrant fire, you see at some point there are just a few locations of the fully developed fire. You see the flames, the you see live coverage videos, but later on you see many more room units. Because there is fire development in each room unit and also the spread later on, like here, this one, when I analysed the videos, you see here this is the fully developed fire, how the fire develops in this unit at the lower floor and so here, this is the ejecting flames coming from this unit. This ejecting flame -- and also you see here on this side of the facade the scaffolding did not collapse yet because the re-entrant fire is on this side. The re-entrant fire caused the immediate collapse of the bamboo scaffolding, but on this side the bamboo scaffolding remains. That's actually becomes the fuel of the combustible items to facilitate the fire spread. When there is ejecting flames coming from this lower floor unit and going upward and causing -- later on, you see after 11 minutes you see the post-fire as a flashover in the upper room, so that indicates the fire -- actually there is a spreading from the lower floor to the upper floor.

And also there is internal fire spread. Because, as I said, this one, you see for this unit, it is only one

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unit subject to fully developed fire, that -- because it is not exposed to re-entrant fire, the unit 2703, but it's actually connected to 2704, because their front doors are so close and they both experienced fully developed fire. So that means in any case the fully developed fire actually caused fire spread through the front doors, actually ignite the neighbouring unit of 2703. So that's different, post-reaction fire stage, the spreading mechanisms.

Eventually, that actually developed into multi-point unit fires. So you can see here, it's around 8 o'clock in the evening. You see that these lights actually shows the fully developed fires in those room units and, later on, around 12 o'clock, midnight, you see there are more, actually, room units being ignited. So these are the mechanisms of the after re-entrant fire, the fire spread after the re-entrant fire. So there's vertical spread and lateral spread.

When we analyse the cause of the fire spread, we base on observations, hypotheses, and our own tests and simulation, we tried to actually analyse it with regard to two aspects, materials and geometry, and also looking at the different stages, like, before re-entrant fire, so initiation stage, and during re-entrant fire, and after re-entrant fire.

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So before the re-entrant fire we have talked a lot on this, how the fire initiated, how the ignition occurred, and also we see here the flaming debris and the ignition of the facade material, the block C, that indicates the role of the material. We also conducted the burning test on the safety net samples collected by the Hong Kong Police Force and we tested them. One is collected from block D, at the ground level, as the test B1 shows. We believe this shows fire-retardant behaviour because you see here we have a 90 kilowatt pool fire, we normally use "pool fire", small fire, to ignite it, and it's only -- you see the shrinking and melting of the net, but you do not see flames from the FR net.

For this sample, this is collected from block H, so it is using the same pool fire to initiate it. You see here, this is the time and these flames actually sustained over the safety net. After six minutes then you see still the flames propagating across the safety net, and 11 minutes, large area of the safety net actually melted, and also on the ground we see the dripping flames.

So that clearly shows the two different behaviours from the safety net.

Further on we investigate that if it's jointly

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burned with the different combustible materials, so it's actually to simulate the behaviour at the flat roof of the re-entrant. We placed the cardboard and wood panels underneath the non-FR safety net. You can see the flames actually -- the dripping flames coming from the safety net, ignite the cardboard and actually the cardboard is fully burnt out afterwards and the wood panels were ignited by the dripping flames of the safety net.

Later on we did another test, actually doubled the volume of the non-FR safety net and also wrapped -- we actually tried to see what is the accumulated behaviour or the impact of the dripping flames over the wood board. And you see here, after like seven minutes, you see the fire flames.

Actually, if we go back to the initiation, the first video we saw on the initiation of the fire re-entrant at block F, it is very similar. At the early stage there is that kind of scattered -- the height is not at that high, it is actually this kind of scattered flames, but later on the flames going upwards and then that's the initiation of a large localised fire which is able to trigger the re-entrant fire we have seen from the video.

THE HON MR JUSTICE DAVID LOK: So, Professor, D1 is the fire-retardant?

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PROF JIANG LIMING: No. Both test D1 and test D2 are from the same non-fire-retardant safety net.

THE HON MR JUSTICE DAVID LOK: Non-fire-retardant.

PROF JIANG LIMING: Yes.

THE HON MR JUSTICE DAVID LOK: You see it's only for how it affect -- because of the --

PROF JIANG LIMING: Joint combustion with the wood board underneath the non-FR safety net.

Actually you see here there are some kind of colour differences. The FR net is a lighter green and the non-FR net is slightly darker green. For all these samples, like for the test B1 and B2, test D1 and D2, they all use the same samples --

THE HON MR JUSTICE DAVID LOK: I see.

PROF JIANG LIMING: -- collected from block H.

THE HON MR JUSTICE DAVID LOK: Yes, I understand.

PROF JIANG LIMING: Because we wanted to reproduce the initiation of localised fire at that flat roof, why these dripping flames can generate a large enough localised fire to trigger the re-entrant fire and that shows how the fire actually develops.

During the re-entrant fire, we found the video, and from the glass breakage analysis, actually we now know how intense the re-entrant fire was in each re-entrant actually because -- one of the major reasons is because

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of the amount of the combustible materials within the re-entrant. Later on we will also talk about the geometry effect. Within the re-entrant, actually, because of the very intensive heating boundary conditions, all of the combustible materials will join the combustion and actually contribute to the development of the fire intensity.

So we actually -- in our lab actually we have this radiant panel system, which is very unique. The first of this kind of system was developed at University of Edinburgh and then University of Queensland, and we are the third one that has this radiant panel system. I think in mainland China there is no such of the system. But this is something unique because it can reproduce the same heating boundary conditions without burning a real fire, a large fire. Because for localised fire, normally, if you have something in the heat flux boundary conditions in a large localised fire, like 3-metre or 4-metre-high flames, the heat flux is -- maximum is actually 120 kilowatt per metre squared, but for this one we can produce up to 200 kilowatt per metre squared. That represents actually the post flashover, it's a very intensive room fire stage, so that is very intensive.

Because for open environment, there is no heat

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conservation, so it's not easy to achieve that high heating boundary condition. But in the rooms, because of the walls, the heat boundary conditions is much higher because the heat is conserved by the walls.

And then for this system we are able to use this to reproduce --

THE HON MR JUSTICE DAVID LOK: So for the benefit of the audience, it seems that University of Edinburgh is actually one of the pioneer universities in fire safety engineering?

PROF JIANG LIMING: That's correct. As Prof Usmani mentioned, the classic book of Introduction to Fire Dynamics, that is Prof Dougal Drysdale, he is --

THE HON MR JUSTICE DAVID LOK: So this originated from that university, this kind of testing system, and PolyU is the third one to have this kind of system.

PROF JIANG LIMING: Yes, we are the third one.

THE HON MR JUSTICE DAVID LOK: For the benefit of the audience.

PROF JIANG LIMING: Yes.

THE HON MR JUSTICE DAVID LOK: This is for the testing of the --

PROF JIANG LIMING: Construction materials.

THE HON MR JUSTICE DAVID LOK: Construction materials.

PROF JIANG LIMING: So to test the construction materials,

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responding to intensive fire, without running a large real building fire, but reproducing the same boundary conditions, because also scientifically it's precise to control with the boundary conditions.

For this test, actually it shows -- during the re-entrant fire how the bamboo reacts to the re-entrant fire, the very intensive heating boundary conditions.

It is correct that bamboo is not easy to ignite, but during -- in the re-entrant area or the space and during that short period, that intense -- because of the intensive heating, you see only, like, actually 10 seconds the bamboo sticks actually evaporate and also a lot of pyrolysis gas was released by the heating, and so this actually is the ignition of the pyrolysis gas released from the bamboo sticks. That's actually how the bamboo sticks joined the combustion during the short period of the re-entrant fire.

If we can -- actually if we stay on the video for like one more minute, when we turn off the radiant panel, you see the charring of the bamboo sticks and also the self-extinguishment of the bamboo sticks. So we have to be cautious in the re-entrant area. These combustible items, but not easy to ignite, would be able to join the combustion if there is very intensive heating boundary conditions. When you turn off,

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definitely the fire will self-extinguish.

THE HON MR JUSTICE DAVID LOK: Professor, I wonder whether you have run the same test in respect of metal scaffolding?

PROF JIANG LIMING: Yes. We actually -- we also used this one actually to test a lot of different materials.

THE HON MR JUSTICE DAVID LOK: Metal platform?

PROF JIANG LIMING: Yeah. But we actually --

THE HON MR JUSTICE DAVID LOK: Did you run it for this particular --

PROF JIANG LIMING: Not particularly for this investigation, but in our past research we actually tested like using the steel plates or steel sticks that actually subjected to -- because steel will melt around temperature of 600 Celsius but would not actually -- definitely would not actually produce the pyrolysis gas.

THE HON MR JUSTICE DAVID LOK: So when we consider whether bamboo scaffolding would be replaced by metal scaffolding, this test would be very -- this would provide a very good reference test for our future?

PROF JIANG LIMING: Yeah. That's why I'm saying the demonstration test -- to demonstrate. But later on, when we talk about the recommendations we're not actually saying -- phasing out bamboo scaffolding for all the scenarios, but for the re-entrant fire we are --

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just wanted to show the heating boundary conditions in the re-entrant area that there was intensive fire.

THE HON MR JUSTICE DAVID LOK: I think further study will have to be carried out and I think both of you may have to put more effort in the future into exploring whether other options and -- because we are not able to have very thorough scientific research now, but in the future I think we have to explore other alternatives, and then for the other alternative materials or other scaffoldings, it may all be subject to different risk and I think you are in a position to assess those risks in the future.

PROF JIANG LIMING: Exactly. Later on we actually wanted to propose to establish a risk assessment rather than just phasing out something. It should be a comprehensive risk assessment of the different materials.

THE HON MR JUSTICE DAVID LOK: Yes. Sorry for the --

PROF JIANG LIMING: So that is to talk about the role of materials. We also run the simulation.

For fire safety engineering research, normally we do test and also we do simulations, but we know that the CFD fire simulations have their inherent limitations. Like here, this one to produce the different contribution of the different materials, but you have to bear in mind we are not able to simulate the falling

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behaviour of the bamboo scaffolding so we actually assume they are -- obviously they are in simulation. So that's the limitation and also, for this kind of large-scale model, it's the size of the grid that is also the limitation.

But here it shows very quick kind of fire development in the re-entrant. It also shows -- for the case 1, all facade materials in case 4 that have bamboo, non-FR safety net and foam boards, if you assume they are not combustible in case 1, it's just a localised fire at the initial stage, and if you only have the bamboo scaffolding only -- later on we will show this -- bamboo scaffolding only, then you still have this large fire. Also for the different levels, then you add this non-FR safety net and foam boards, the fire becomes intense, but the degree of the fire was not increased so much. So again, we have to be cautious about the combustible materials in the re-entrant area.

For the foam boards, the polystyrene foam boards, also used the same radiant panel system. We want to see during the re-entrant fire stage, if you have intensive heating, what is the response of that.

Initially, to be honest, I thought that it will stick to the glass pane, will trigger the flames over the glass panels, but from our test, it always shows

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falling-off behaviour, so it fell off very quickly when it is heated, because it is melted down. So it will be melted by the heat and then fall off.

But the falling-off of the polystyrene boards, actually when it was ignited, it actually sustained the flames for quite long. So that actually indicates this kind of behaviour, especially not for the re-entrant fire, re-entrant fire, because as we mentioned, a lot of combustible material has already joined combustion, but later on, as I mentioned, for the post-re-entrant fire stage, the facade fire spread, these polystyrene boards may contribute to the vertical fire spread because they will actually fall right before or in front of the glass windows that actually sustained the flames. That's the defect.

And for after re-entrant fire, the subsequent fire spread, also we did our test. But here, the heating boundary conditions using radiant panel is not that intense. Now, it's 50 kilowatts per metre squared. That one, the previous one, it's around 150, so it's three times of the heat flux.

For this one, it's to actually simulate kind of moderate, not that high, because as I mentioned, a large localised fire is around 120 kilowatts per metre squared and this one is 50 kilowatts per metre squared. So it's

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not very intense localised fire. Here it actually reproduced similar behaviour as we saw from the video; there's burning of the bamboo. But this fire impact is not as intense as the re-entrant fire, but we see the reproduced fire behaviour.

Also we run simulations to analyse the after --

THE HON MR JUSTICE DAVID LOK: So the conclusion is that -- or perhaps the observation is that for the re-entrant fire, because the fire was so intense, whatever combustion material doesn't make a lot of difference.

PROF JIANG LIMING: That's right.

THE HON MR JUSTICE DAVID LOK: However, for the lateral spreading of the fire, then it makes a difference because the foam board will fall down and then it would burn for quite a bit of time, and also for other wooden boards, bamboo, safety net.

PROF JIANG LIMING: Yeah. Again, in our recommendation actually we address this kind of different behaviour. Actually, not -- for the flat facade remote from the re-entrant, the fire spread is not that quickly and also the burning is not that intense, even the bamboo scaffoldings remained at the facade. That's why I'm saying we're not actually to ban the bamboo scaffolding for all scenarios, but there is a risk assessment.

And the simulation tells the same thing, how the

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fire spread on the remaining facade material.

For the role of geometry, the first thing I want to point out, there is a flat roof at the bottom of the re-entrant which actually has the accumulated dripping flames and also the combustible items that joining the combustion, to initiate the localised fire to trigger the re-entrant fire.

The second thing is the distance between the different buildings because they are so close -- and I mentioned for block F and block E, the spread from one re-entrant to other re-entrant is not actually due to the dripping flames. It's very fast, so that is believed to be because of the short distance between the re-entrants, also because of the combustible materials at the ground. And from block F to block E, these two re-entrant fires are actually on the opposite side so that means actually, because of the short distance facilitated this fire spread very quickly from block F to E. So we must be cautious on this, like, combustible materials in the two adjacent buildings of a short distance.

And for the others, because of the weather condition on that day, the wind actually brings the flying debris, the flame debris to other buildings. That is also another issue.

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During the re-entrant fire, the geometry effect, actually we pointed out a few times that that actually facilitated the upward flames and the fast growth of the fire. Here, this video actually shows a different kind of geometry.

(Video played)

The flat facade, it did not prompt the smoke spread and fire and smoke spread very intensively, but where we have a corner, somehow you have intense or higher flames. And for the re-entrant that we see in the -- in Wang Fuk Court, actually the height is -- and also this one is actually to assume only the fire at the bottom. So not actually a fire in the whole re-entrant area. Previously I already showed in our simulation another series of simulation cases actually shows how the fire entered very developed stage and the flame height is very high.

Another issue of the geometry, because as we mentioned, it's semi-enclosed kind of geometry, actually the walls conserve the heat and that -- because for the open environment, then the heat will actually -- there is a significant amount of heat loss to the ambient environment but for the re-entrant area, because the wall actually confines the heat within it and then there is a lot of radiation because the walls will be heated

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and there is created radiation. That's why we can get very high heat fluxes and that actually explains when we have this, why in the kitchens we see that kind of like explosive impact. So the heat is very intense.

And section 3, that is again heartbreaking to analyse the fatality causes. When we analyse it we actually see how the fire and smoke -- fire was initiated during the re-entrant and after re-entrant fire and also how the smoke entered the different room units. As we mentioned before, regardless of type A or type B units, the kitchens and also the side windows of this hallway or the corridor of their room units, they were subjected to very fast kind of glass breakage. So as the picture shows, it's complete fallout of the glass panel. That actually means there's openings. So the whole windows become openings to the smoke to facilitate the smoke travelling, so that actually the smoke, after the re-entrant fire -- so this is like, for the first re-entrant, three minutes later you see how much of the smoke has been generated after the re-entrant fire.

The reason is -- we believe the hypothesis is because of the falling of the bamboo sticks in the re-entrant area, so then because of the insufficient supply of air, so it's like that inefficient combustion produced loads of smoke. And that smoke -- you see now,

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these are the openings facing to the re-entrant, so the smoke actually can flow into these room units which were directly exposed or affected by the re-entrant fire.

Then if you restructure the smoke spread history, when we have the re-entrant fire, in a very short period, actually a large amount of smoke will enter these room units which -- like for the first one, unit 4 and unit 5 of block F. And also the re-entrant fire is able to enter the staircase. That point has been mentioned before, in yesterday's presentation. But now you have seen the smoke inside their units and smoke inside in this unit and also the smoke in the staircase. So literally they don't have an escape path for them to be rescued from the buildings for the first one.

THE HON MR JUSTICE DAVID LOK: Earlier we were focusing on the smoke going into the staircase, the means of escape from the re-entrant area. Now you are talking about the effect of the smoke actually going into the apartment themselves, through the breakage of the window.

PROF JIANG LIMING: Yes. We are not saying that the smoke entering the staircase is not important, definitely it's not. Because when we are designing the buildings for fire safety, we want to ensure the staircases for the ultimate safety. But for this one, we have to point out another aspect, that is actually smoke entering the room

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units at very early stage of the re-entrant fire.

THE HON MR JUSTICE DAVID LOK: I see.

PROF JIANG LIMING: So this one again shows how much of the smoke, even though there is not much fire, there is no fire actually burning in the living room or the bedroom, only -- but the kitchens, during the re-entrant fire stage, there's large amount of the smoke entering the room because of these openings. You see the smoke marks.

For the staircase, I think it has been explained, because the ventilation purpose of the upper section and also the replacement of the access, the temporary access. These again facilitated the smoke entering the staircase room.

For the distribution, I want to show this indicates the first re-entrant fire, the red colour, and then 6/7 is the second re-entrant fire, 8/1 is the third re-entrant fire. Units 2 and 3 is not subject to re-entrant fire but you see the distribution of the fatalities. You can imagine that for the first -- for units 4 and 5, they will quickly -- because they see the glass breakage and the smoke entering in their buildings very quickly, so they will actually move to the staircase and the corridors. That's why again you do not see the fatalities in their room units but the

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majority will be in the staircase and the corridors. But for the others, the extreme -- dangerous case, that is for units 2 and 3, because they are not subjected to the re-entrant fire, if you analyse, you see the post-fire photos, you won't see the fire burning kind of remaining in that room. So there's no fire burning in those units but the people died in those units.

Later on we will explain --

THE HON MR JUSTICE DAVID LOK: Because of the smoke?

PROF JIANG LIMING: Because of the smoke, yeah.

THE HON MR JUSTICE DAVID LOK: I see. So because, for some of the units, they are not exposed to the re-entrant side, but people still died, it's because of the smoke.

PROF JIANG LIMING: Because of the smoke, yes.

So this is the distribution. Actually we will cover that.

So this is a summary. 24, 81 victims, I think that has been reported before, so number of the victims found in the units and the number of the victims found in the corridors and the staircase rooms. That, actually, if you restructure the fire and smoke spread history, you see the possible responses of the residents when they are subjected to this re-entrant fire and the later on fire.

So the video footage showed the fire spread from the

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bottom to the top within very short period of time. But again, for the smoke spread to the staircases, I think that has been analysed and pointed out. That is a situation that frustrated people to be rescued through the staircases when we realised there is fire and smoke in their rooms. So this one here, actually the video camera actually shows the smoke flow from the facade to the lift window.

And the general observations -- because the re-entrant fire, generating smoke is not only carbon monoxide and also smoke on concentrations and toxic gases from the burning of the plastics, so that will enter the rooms and staircases. When people breathe in that, it will lead to deaths.

For the particular cases and also for this one, again I don't want to show this but it shows this is the first re-entrant fire. This one actually wasn't subjected to the re-entrant fire. It's 2603 unit. That is this one; there was no re-entrant fire. The residents actually opened the door, they saw the smoke already spread in the corridor, so that was due to the burning of 2604 which is subject to the first re-entrant fire. Because 14:59, that is peak time of the first re-entrant fire of block F, so the smoke actually coming from 2604, because the 26th floor, when we analysed the

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post-fire photo, that room was ignited and it experienced fully developed fire.

So you can see that during the re-entrant fire, a lot of smoke already coming out from 2604 and that spread to the front door of 2603, but 2603 was not subject to re-entrant fire.

For the fatality in unit 1202, it is similar. 1202 is not subject to re-entrant fire because units 02 and 03 of block F were not subjected to the re-entrant fire. But this one, actually you see that, because of the fire burning in 1201, that was subject to the third re-entrant fire of block F. And people actually tried to move to the unit -- initially they realised there was a fire, they moved to the other units, and these other units were subject to the third re-entrant fire, and they died for that.

This actually shows there's no fire in the unit 1202 because it is not directly subjected to the re-entrant fire, there was no re-entrant fire occurring here. But their neighbouring unit had a post-flashover fire, a very intense fire. That's 1201.

THE HON MR JUSTICE DAVID LOK: So it's because of the fire in the other unit spreading the smoke --

PROF JIANG LIMING: Yes. Because their front doors are just opposite-facing, so there is smoke actually coming out

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from 1201, actually entering 1202.

But actually that's one of the questions. When we watched the videos, there is not large amount of smoke entering 1202. For myself, I always ask the question whether if they stayed in their own unit, 1202, whether they would die or not. Actually, if they opened the windows to ventilate the smoke, because there was no fire, and the limited amount of smoke through the front doors, they may remain safe. So that is 1202.

For 2602, again it's a similar situation. Because there was not the re-entrant fire in affected unit, and they actually moved to the other unit, and that caused the death of the residents.

This is actually a summary of the assessment of the fatalities. In these particular units that are not subjected to re-entrant fire and they did not see fire burning in these room units, but there were fatalities.

So this is the kind of summary of my analysis, although actually due to limited time we cannot present a lot more details, but this is what we found according to the timeline of the fire spread and also the smoke spread.

THE HON MR JUSTICE DAVID LOK: Yes. Thank you. I think since we have absorbed a lot of things within a short period of time -- for lectures I think students only

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have an attention time span of about one hour -- so can we suggest that -- I think we also want to spend more time perhaps on the recommendations. Shall we take a break of 15 minutes so that we can continue with Prof Usmani's recommendations later.

We will take a 15-minute break.

(11.05 am)

(A short adjournment)

(11.20 am)

THE HON MR JUSTICE DAVID LOK: Professor, you can continue with your section 4 of your presentation.

PROF ASIF SOHAIL USMANI: Thank you, chairman.

We have a detailed review of the IFITF report and the firefighting response in our report. So here I'm just going to mention a few points, not too much detail.

If you look at the firefighting process, the Fire Services Communications Centre received the first building fire call at 14:51. Senior station officer arrived at the site at 14:56, indicating a five-minute response time and demonstrating that frontline firefighting response was effective and efficient. During firefighting operations, the pre-determined attendance, PDA, alarm level was escalated at follows: number 1 alarm at 14:51, upgraded to No. 3 alarm at 15:02, upgraded to No. 4 alarm at 15:34, and to

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5 at 18:22.

Resource deployment increased significantly in line with the PDA levels. There was a delay in upgrading No. 4 and No. 5 alarm but the PDA deployed at No. 4 alarm had already exceeded the No. 5 alarm requirements.

The incident was unprecedented in both scale and circumstances. In practical terms, very limited additional action that the FSD could have taken on site to materially alter the outcome.

If we look at the fire statistics around the world, there are statistical reports from various countries and regions. They are published in various publications.

If we look at the average statistical results from 1993 to 2023, the average number of fires per 1,000 inhabitants, this is for other countries and regions generally, so number of fires per 1,000 inhabitants is 1.6; average number of fire deaths per 100,000 inhabitants is 1.6; the average number of fire deaths per 100 fires is 1.

The Hong Kong FSD publishes statistical information annually. The results of the statistics for Hong Kong from 2005 to 2024 are that the average number of fires per 1,000 inhabitants is 1.07. So compared to the 1.6, a bit lower. Average number of fire deaths per 100,000 inhabitants is significantly lower, 0.26. The average

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number of fire deaths per 100 fires is also a third of the global average, which are essentially advanced economies, mostly.

The fire fatalities in Hong Kong are significantly lower than the global average fire fatalities before the Wang Fuk Court fire.

Unfortunately, the Wang Fuk Court fire itself contributed to 2.24 deaths per 100,000 inhabitants, which is significantly higher than the previous statistical average in Hong Kong.

So this suggests that the strong firefighting performance and fast response from FSD cannot compensate for the weaknesses in other areas, in this case primarily the regulation and management of temporary works.

On the ITF report we have quite a few detailed comments in our report, but here just mention a few. We are in general agreement with the IFITF expert's findings and greatly appreciate their effort in carrying out the large-scale fire test on a mock-up of the re-entrant in Sichuan. We have a couple of key observations in this regard.

There are inherent limitations in a three-storey fire test, as a 31-storey building fire will develop a much more significant chimney effect. IFITF report

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highlights that a large enough fire would consume fire-resistant safety net. Caution must be exercised in assuming that fire-resistant materials could prevent the fire.

So these are some of the comments made which we sort of -- we generally agree with but we say that there should be some caution exercised.

Fire-resistant materials are only fire-resistant materials because they have passed some test, which may be inadequate. Grenfell is a salutary lesson that should not be forgotten. Grenfell -- there was no -- like in this case we may have non-fire-resistant nets which may be violating the regulations, but in Grenfell, they were not violating the regulations; they had passed the test and it still happened.

After making that point, I'd like to come to the summary and recommendations. Before we go into the actual recommendations, I'd just like to have a couple of slides just for setting the context.

How temporary works in buildings are regulated. Building regulations are primarily focused on fires originating inside building compartments. External fires in Hong Kong buildings are not considered likely as regulations expressly prohibit the use of combustible materials on building exterior facades.

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So that's why a Grenfell-type incident could not occur in Hong Kong, because we don't have buildings which have combustible facades.

Firefighting strategies and training are also focused on indoor fires, which constitute the vast majority. These are generally the most fires that happen, maybe more than 90 per cent. There are no effective firefighting strategies for facade fires in tall buildings globally.

Combustible materials are allowed for temporary works as it is not considered part of the building facade because it's temporary. The exception are the lift wells post Garley Building fire. So leading to frequent fires in buildings under renovation and/or repair. So this is what we have seen, at least -- I think most people have noticed that there have been quite regular fires on building facades.

Multiple adjacent buildings being clad in the same envelope simultaneously for prolonged periods of time, in this case well over one year, challenges the use of the term "temporary", severely increasing the risk. This is primarily, in our opinion, a systemic failure and must be reviewed at the level of public policy and appropriate changes must be made in how temporary works are regulated.

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So you have heard in great detail about how the fire spread and how the disaster unfolded. I would just like to summarise the key sort of steps, the chain of events, because ultimately all major disasters are a series of failures rather than a single failure and multiple sort of things happen which ultimately lead to the final result.

So the first one would be collection of combustible materials, whether fire-resistant or not, within all re-entrants on the building facade temporary works, scaffolding and flat roof.

Geometry of the re-entrant governed the fire development, so this Prof Jiang already mentioned. An extremely rapid upward fire spread which is unprecedented in the history of major building fires, with the highest velocity of the spread being up to almost 10 metres per second -- compare that to Grenfell, which was about 8 metres per minute. So much, much faster -- to be on the top of a building almost like a jet flame, almost like a volcano.

People are talking about wind, but fire creates its own wind. If you have a very large fire like -- so this, to me, is quite similar to a violent fire like a forest fire, so you have lots of large buildings, huge, like, big trees, and one after the other, they

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sort of ignite. The fire itself creates a kind of suction and the wind blows. So if there was wind, then obviously that would be also additional effect. So once the re-entrant fire ignites, it goes up very high speed, hot gas flows upward. It acts almost like a jet flame or a volcano that's ejecting a lot of burning material and then the wind then spreads it out. So this is the second major thing, the re-entrant geometry. A very high-consequence event, basically.

So risk -- again, I should mention that risk is a product of probability and consequence. So you can decrease the probability of something happening by fire retardants and all those kind of things, but if the consequence is going to be very high, then the product -- even though probability is small, the consequence if that number is high, then the risk would still be high. So I think we need to think of it from a risk perspective.

THE HON MR JUSTICE DAVID LOK: Can you repeat, Professor, risk is a product of --

PROF ASIF SOHAIL USMANI: Risk is a product of probability times consequence. So you cannot just look at -- say the risk is reduced by reducing the probability of a fire happening. If you reduce the probability of a fire happening by fire-retardant materials, that's fine. But

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if the consequence of a fire is going to be exceptionally high, which in this case it was, it was a massive event, unprecedented, then the risk is not just the probability that you have reduced but also the consequence. So if you multiply them together, then your consequence -- if the consequence is very high, then the risk is still high. So I think we need to keep that in mind.

So the direct connection of the re-entrant space to the public areas, including the fire escape, staircases, ingress of smoke and hot gases, which have been talked about, this is the third thing that blocked evacuation paths and also pretty much made the available safe egress time to zero. Breaking of windows with single panes of glass located outside re-entrant facades, so this is spreading the fire, as Dr -- well, Prof Jiang keep saying. Sorry.

Recently PolyU said all professorial staff must be called "professors". So we're used to calling each other "doctors" before, but now we're calling each other "professor", so old habits.

So Prof Jiang already mentioned the spread through the units themselves.

Breaking of windows with single panes -- I mentioned that already. Spreading through apartment.

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Breaking of living room windows adjacent to the re-entrant enabled fires to find another route to enter the apartments directly, causing burnout of high fuel loads.

I think, again Prof Jiang showed that in detail.

And then the last part is the spreading of the fire from the first re-entrant fire to the other re-entrants in the same building and to the re-entrants in the neighbouring buildings because of the fire-induced fountains of embers exacerbated by the winds and also the winds created by the fire itself.

So these are coming to the recommendations. These are recommendations that could be considered for relatively immediate implementations. In that sense, I would not say that these should be binding forever. These are potentially seen as interim measures where potentially a risk exists and there's lots of tall buildings in Hong Kong. There may be many situations like Wang Fuk Court in other places, and so we ought to be taking steps to protect those people that may be exposed to such kind of risk. So in that context, these recommendations are made in a sort of sense, until we come to a point where we make a much more considered study in collaboration with all stakeholders, and come up with a more considered approach. Until then, we

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should probably be erring on the side of caution and maybe making more stringent recommendations. That's been our kind of thinking.

So do not permit simultaneous cladding of high-rise buildings with combustible temporary works that are adjacent or in the vicinity of each other.

Architectural features such as re-entrants in Wang Fuk Court should be considered as part of a building, as a special kind of vertical shaft.

For high-rise building facades under renovation, a higher regulatory bar should be set where buildings remain occupied during the works.

In addition to the duration of the project, other considerations in approval of the repair and renovation works should be any special features of the building, such as its geometry, distribution and location of windows and openings, any exits and entrances, provision of refuge floors, et cetera.

Continuous monitoring of the site should be undertaken using currently available automated monitoring systems based on computer vision with independent detection and potentially suppression systems.

No combustibles should be allowed on any part of the building facade that could enable heat and smoke to

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enter the building and block evacuation routes.

No combustibles should be present above the ground level exits that could allow materials from the temporary works to fall and block exits.

Stricter oversight must be maintained to ensure that all materials used in temporary works have been adequately treated with fire-retardant compounds with proper certification and source identification, which may already exist.

Site workers must receive regular training to maintain awareness of the fire hazards and remain vigilant.

Intensive induction of occupants and workers must be conducted before commencement of the repair/renovation works followed by routine fire drills.

Building management structure. The property management committee or owners' corporation, and their coordination with the Housing Authority regime, should be reviewed.

Okay. I think my laptop seems to be stuck. It's not moving.

THE HON MR JUSTICE DAVID LOK: I think, for the purpose of the -- I'm thinking of one thing -- I'm talking to the audience -- is that in relation to your presentation, I think of course the whole presentation, whether it would

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be uploaded of course would be -- we have to subject to some review because it may affect subsequent proceedings or whatever, but I think -- may I suggest that for the recommendation part, I would suggest that the recommendation, these few slides containing the recommendation, be uploaded as soon as possible to encourage --

MR VICTOR DAWES: We actually had some discussions about that this morning, and I think we can get back to you fairly quickly.

THE HON MR JUSTICE DAVID LOK: Because I think these may promote more public debate or discussion, and I was thinking if there is any concern about these few slides about the recommendation that should not be uploaded, I want to listen to any -- because, otherwise, I want the public to get these information as soon as possible. So I'm just thinking of these few slides about the recommendations. So maybe I listen to you in due course as to how to treat this. Yes. Thank you.

Please go on.

PROF ASIF SOHAIL USMANI: So as I said, the recommendations that we are proposing for potentially immediate implementation are more from a point of immediate attention to potential risks that there may be buildings and occupants that may be already exposed to that kind

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of risk and we don't want that to happen again, so there should be perhaps a bit more stringent attitude to that.

However, for long-term, more considered way of managing building fire safety and temporary work safety and temporary work situations, we would need much more sort of organised way of -- based on research and based on consultation, of coming up with a new way of dealing with these things.

So a well thought-out and well-designed risk-based methodology must be developed for the approval of repair and renovation works for all buildings in Hong Kong, enabling a bespoke building-specific temporary works solution to be implemented with appropriate safety measures, including potentially redundant fire safety installations.

Development of new, less combustible, light-weight materials that could be used in temporary works, that could require some research.

Development of bespoke redundant FSI, for fire safety installation, systems especially for temporary works such as temporary sprinkler systems.

Dedicated apps for each building should be developed to provide information to individuals. Reporting and alarm and portal to each residents, including live video feeds. I mean, these days potentially you don't

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necessarily need building alarms, you may just have personal alarms, that is people are carrying mobile phones all the time and they can tell each other. The more eyes, the more the likelihood of early fire detections.

In the longer term, smarter technologies could enable real-time monitoring of high-risk sites using digital twins and identifying the most serious potential hazards and disaster scenarios in advance through AI-based simulations and AI-based automated building safety management.

We also would recommend some policy-level changes. So since every building -- I won't read through all of that. Since every building project is different, they may have features that may throw up unforeseen challenges to occupant safety. So on a case-by-case basis, there should be a certain level of rigorous engineering analysis and engineering judgment should be exercised and mandated for each individual case, and there should be some body that is responsible for approving that. This is being done in other cases, such as after the Grenfell fire UK has done that. Without the risk of throwing the baby out with the bathwater, it is recommended that a committee is formed to review Hong Kong building regulations and codes of practice to

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ensure some level of responsibility is borne by stakeholders. So regulations should not be a shield.

How to interpret and execute public policy? How does the system check and ensure the policy is fully executed? There's no effective mechanism to learn from past incidents and make changes to fire safety policy. So strategic-level routine risk assessment of urban hazards should be mandated. I would end with this final observation. Had the re-entrants faced the same restrictions as lift wells, post Garley Building, this tragedy could not have occurred.

That's the end of my presentation.

THE HON MR JUSTICE DAVID LOK: Yes, thank you very much, Professor.

MR VICTOR DAWES: Thank you, Professors. There are a few areas where I will have to trouble you with a bit of amplification. Before that, can I congratulate the two of you. I understand that you have just won the Philip Thomas Medal for best paper by the International Association for Fire Safety Services.

PROF JIANG LIMING: Thank you.

PROF ASIF SOHAIL USMANI: Thank you.

MR VICTOR DAWES: So that was a recent thing, I gather.

If I can do it this way. For public consumption, I just want to try to summarise a few key points. If

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there's anything you want to add to them, by all means.

It would appear from your presentation that the geometry of the re-entrant was really a key factor in this tragedy.

PROF ASIF SOHAIL USMANI: That's right.

MR VICTOR DAWES: You would agree with that?

PROF ASIF SOHAIL USMANI: Absolutely.

PROF JIANG LIMING: Yes.

MR VICTOR DAWES: From your CFD simulations, it is clear that whilst the geometry of the re-entrant resulted in a dramatic chimney effect, the rapid, vertical fire spread is mainly governed by the availability of continuous combustion of material within the re-entrant.

PROF ASIF SOHAIL USMANI: Yeah.

PROF JIANG LIMING: Yes.

PROF ASIF SOHAIL USMANI: Correct.

MR VICTOR DAWES: If we look at the re-entrant in Wang Fuk Court, that includes a large quantity of combustible materials, such at bamboo, non-fire-resistant nets, canvas, toe-board, foam board and, according to your simulation, the non-fire-retardant net really acted as a continuous vertical wick, like the wick in a candle; right?

PROF JIANG LIMING: Yes.

MR VICTOR DAWES: And that then enabled the flame to

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propagate across the 31 levels.

PROF ASIF SOHAIL USMANI: Correct.

PROF JIANG LIMING: Yes.

MR VICTOR DAWES: From the experiment that you have conducted, you have demonstrated how the non-fire-retardant net seized by the police from Wang Chi House generated dripping flames and propagated ignitions very rapidly, even after the source of the fire had extinguished.

PROF JIANG LIMING: Yes.

MR VICTOR DAWES: In contrast, it would appear that the fire-resistant net did not exhibit these characteristics.

PROF JIANG LIMING: That's correct.

MR VICTOR DAWES: In one of your experiments, you demonstrated that when burnt by a small localised source of fire, I think it was 0.09 megawatts, the non-fire-retardant nets dripped and distributed flames to cardboard and wooden panels, and this allowed the fire to grow significantly large to ignite the bamboos.

PROF JIANG LIMING: That's correct, yes.

MR VICTOR DAWES: On bamboos, my understanding is that you're not advocating a change. You're not suggesting that we shouldn't use bamboo, right?

PROF JIANG LIMING: No.

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PROF ASIF SOHAIL USMANI: No.
MR VICTOR DAWES: Definitely not. And insofar as bamboo is concerned, I think the point you're trying to get across is, although it is not easy for it to catch fire, if it is hot enough like the re-entrant, it will burn.
PROF ASIF SOHAIL USMANI: That's right.
PROF JIANG LIMING: Yes.
MR VICTOR DAWES: The other point that is obvious is that of course it's more difficult to burn steel. It is prima facie not combustible.
PROF ASIF SOHAIL USMANI: It's not combustible.
MR VICTOR DAWES: Yes. But you're not saying that for the re-entrant just use steel. All that you're suggesting is we should look into this.
PROF ASIF SOHAIL USMANI: In fact, for now I think I am suggesting that.
MR VICTOR DAWES: No, no. In the long -- let me qualify.
PROF ASIF SOHAIL USMANI: In the long run, yes. In the long run, we consider -- there's a difference between the immediate recommendations and the longer run.
MR VICTOR DAWES: Yes.
PROF ASIF SOHAIL USMANI: And then you can relax some of the restrictions you make in the immediate one, because the immediate risk should be considered.
MR VICTOR DAWES: If I understand you correctly, you are

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suggesting some measures that, in the long run, may prove to be unnecessary. But before we have those solutions, let's be safe rather than sorry.
PROF ASIF SOHAIL USMANI: That's right.
PROF JIANG LIMING: That's right, yes.
MR VICTOR DAWES: I see. If we look back at your experiment, I think what they're showing is that the behaviour of the non-fire-retardant nets, especially the dripping of flames by the nets on to the combustible item, that have played an important role in initiating a fire to unlock the energy inside the bamboo sticks.
PROF ASIF SOHAIL USMANI: That's right.
MR VICTOR DAWES: And had they not been ignited, the result would have been very different.
PROF ASIF SOHAIL USMANI: Yes. This is the conclusion from the IFITF report and Prof Yuen's analysis. To this, my -- while I agree with that generally, I don't have any reason to doubt that, however, I would say the operative word here, the most important one is "may".
MR VICTOR DAWES: Yes.
PROF ASIF SOHAIL USMANI: So when the risk is so high, I think we cannot rely on "may". We have to make sure that this doesn't happen. And as I said, Grenfell passed the test. So here again, we already have regulations that there should be fire-retardant nets,

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but the event still happened. So there's no way of guaranteeing that it's not going to happen unless you have non-combustible.
That's the point I'm making. It's not to say -- while I agree potentially if there had been fire-resistant nets this may not have happened. However, "may" -- so clearly it happened. So going the same route, following the same route in future is not safe. That's the point.
MR VICTOR DAWES: There appears to be two concepts here. Firstly, I think if I understand you correctly, what you are saying is that simply relying on fire-retardant nets in the re-entrant, in your view, that is not good enough.
PROF ASIF SOHAIL USMANI: Not good enough.
PROF JIANG LIMING: No.
MR VICTOR DAWES: Secondly, I think you justified that by referring to the fact that, look, there is a matter of risk.
PROF ASIF SOHAIL USMANI: That's right.
MR VICTOR DAWES: But because the consequence -- now that we know how the re-entrant operates, given the high risk, as we have all looked at the chimney effect, you won't count on -- you won't count on the fire-retardant --
PROF ASIF SOHAIL USMANI: No. In fact, I could sort of

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mention here the actions taken by the British -- England and Wales mainly, post-Grenfell. Grenfell happened 2017. The approved document B is the document that governs fire safety in buildings in England and Wales. In 2018, they banned all combustibles from all facades. Not just --
MR VICTOR DAWES: They went quite far?
PROF ASIF SOHAIL USMANI: Yes, I think they have overreacted, but that's what they have done. So they're saying no combustibles at all on all facades.
MR VICTOR DAWES: Yes, and I understand you are not going so far.
PROF ASIF SOHAIL USMANI: No, we're not.
MR VICTOR DAWES: You are targeting the re-entrants.
PROF ASIF SOHAIL USMANI: We are talking about targeted areas, not just re-entrants. It could be corners, it could be other areas.
PROF JIANG LIMING: If I can add that, as Prof Usmani already mentioned, the risk is actually based on the probability and the consequence. So from our past experience, the probability for small localised fire is actually much higher. Actually, referring to Grenfell, the initial fire is actually from a kitchen, so it's a kitchen fire and it produced a localised fire out of the window, actually ignite the cladding materials. So that

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actually probability is high.

From Wang Fuk Court, perhaps based on our analysis, then, it's due to the dripping flames accumulation, but there is also high possibility there is some fires from the room units. If there is a kitchen fire or something else that actually initiate the localised fire enough, that actually can skip the accumulating of the dripping flames and is able to produce a localised fire and ignite the items in the re-entrant area. So that's the point.

MR VICTOR DAWES: So again, if I can just repeat that so that everyone can understand. Because the re-entrant in this particular case consists of windows that are linked to the kitchen and the kitchen, I understand, is usually a high-risk area because you cook.

PROF ASIF SOHAIL USMANI: Cooking, yes.

MR VICTOR DAWES: And what you are saying is, if there are combustible materials in the re-entrant, another possibility is that even if there is nobody who smokes at the ground level, the kitchen fire can actually affect the combustible materials at the re-entrant in another scenario.

PROF ASIF SOHAIL USMANI: That's right. We are basically suggesting that there are multiple ways of a fire to start, and in this case obviously this was a site

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management issue. But as Prof Jiang mentioned, a kitchen fire could do the same thing. Arson could do the same thing. There are multiple ways of these things starting. And if you take that risk, then you put lives at risk. I think that's the key point.

MR VICTOR DAWES: Another aspect of your conclusion is that the polystyrene foam boards, they melt off quickly, they can drop from the gas panel when subject to intense heat, and once fallen, that will add to the fuel load, and that will also propagate the sustained flames when they land on the combustibles. So that is another area of concern.

PROF ASIF SOHAIL USMANI: Right.

PROF JIANG LIMING: Yeah, that's what we observed from the test.

MR VICTOR DAWES: We know the fatalities were predominantly caused by the smoke inhalation and you have examined the pattern of the smoke. So it is -- the risk is really not just on direct fatality caused by the fire, the smoke is another area that you have studied.

PROF JIANG LIMING: That's right.

MR VICTOR DAWES: And we know what your conclusions are.

If we look at the CFD simulations, as chairman discussed with you, Prof Jiang, this morning, it is really the large windows that is adjacent to the

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re-entrant that has resulted in the severe damage to the relevant units in your type A scenario.

PROF JIANG LIMING: Yes, correct.

THE HON MR JUSTICE DAVID LOK: But is it right, Professor, you also agreed with the assessment of the joint task force that in relation to the so-called "sang hau", that is means of escape, they have the wooden panel, that also play a very important part in the smoke coming in and filling the staircases, because a lot of victims was found --

PROF JIANG LIMING: In the staircases, in the corridors.

THE HON MR JUSTICE DAVID LOK: You agree with that assessment?

PROF JIANG LIMING: Yeah, we agree with that.

MR VICTOR DAWES: Can I focus on the recommendations. There's one aspect that -- one of the recommendations that you have made, and for everybody's reference it's paragraph 7.3.1(h). I don't need you to turn that up. Is that all external windows of staircases and lift lobbies that face into the re-entrant space or are within 6 metres of any unprotected opening shall be retrofitted with fire-rated windows.

Can you just explain the 6 metres, first of all?

PROF ASIF SOHAIL USMANI: The 6 metres is coming from one of the codes of practice, I think.

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PROF JIANG LIMING: Yes.

PROF ASIF SOHAIL USMANI: So that basically is essentially if you have a fire in an adjacent building 6 metres away, so 6 metres is seen as a sufficient distance at which, if you are beyond 6 metres, then the radiation would not be strong enough to ignite a fire in the --

MR VICTOR DAWES: I see.

PROF ASIF SOHAIL USMANI: So if you are less than 6 metres, then your radiation could be strong enough to ignite a fire in your building.

MR VICTOR DAWES: And I think if I understand you correctly again, what you are really recommending is that all the re-entrant-facing window, now that we know the risk of the re-entrants, even for older buildings, we should really try to replace them with fire-retardant windows.

PROF ASIF SOHAIL USMANI: Well, that kind of is applicable if we still insist upon putting in combustibles in the re-entrant area.

MR VICTOR DAWES: Yes.

PROF ASIF SOHAIL USMANI: So I would first not put combustibles in the re-entrant area, but if you are going to do that, then definitely.

MR VICTOR DAWES: Yes. In an ideal world from a fire safety angle, of course we can do everything. But I think it is part of basic principle in fire engineering that they

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can compensate or supplement each other. So if you have some combustible, you would recommend these measures; if you ban combustibles in the short run, it may not be necessary.

PROF ASIF SOHAIL USMANI: That's right.

MR VICTOR DAWES: Thank you. Again focusing on recommendation, I think we want to -- we have spent quite a bit of time on what happened. Let's do a bit more forward-looking.

You have actually explained Hong Kong has traditionally had a high standard on fire safety when compared to other developed countries as well.

PROF ASIF SOHAIL USMANI: That's right.

MR VICTOR DAWES: I mean, this incident puts us off the chart now.

PROF ASIF SOHAIL USMANI: Yes.

MR VICTOR DAWES: And I remember when we discussed this matter in the past, you've also given me the idea that it is also partly due to the fact that we have a robust scheme for renovating old buildings.

PROF JIANG LIMING: Mm-hmm.

MR VICTOR DAWES: If there is none, then of course it would be very different. But it is also necessary of course to look at other risks.

PROF ASIF SOHAIL USMANI: That's right.

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MR VICTOR DAWES: If the building is old and out of repair, there are also other risks, so it's really a matter of finding balance with --

PROF ASIF SOHAIL USMANI: That's right.

MR VICTOR DAWES: And you -- based on your presentation now, can I just ask this question. It would appear that what you are suggesting is that the tragedy was foreseeable but not foreseen.

PROF ASIF SOHAIL USMANI: Yes, that's right.

MR VICTOR DAWES: And I think Prof Usmani, you referred to the three examples.

PROF ASIF SOHAIL USMANI: Mm-hmm.

MR VICTOR DAWES: And you said the risk of combustible materials in any re-entrant area. I mean, that seems obvious, with the benefit of hindsight; right?

PROF ASIF SOHAIL USMANI: That's right, yes.

MR VICTOR DAWES: And those in the construction industry, on one view they should have been aware of regulation requiring the use of fire-retardant materials in facade works, as well as the obvious danger of filling the scaffolding area with combustibles, like the wooden planks and carton --

PROF ASIF SOHAIL USMANI: Cardboard and paper.

MR VICTOR DAWES: On a policy level, you have talked a bit about Grenfell and the Garley fires. Can I just ask you

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to end by trying to explain this, perhaps in summary way.

PROF ASIF SOHAIL USMANI: Okay.

MR VICTOR DAWES: What have we -- what was the obvious risk that was overlooked?

PROF ASIF SOHAIL USMANI: So, for example, in the Garley Building fire we had this situation of a lift well filled in with combustibles that created a similar kind of fast, rapid spreading fire that unfortunately killed so many people. That was the obvious risk and that could have been foreseen potentially through -- even looking at Kings Cross which is in a similar situation.

If you look at the policy-level recommendations, I think Hong Kong took quite a strong action after the Garley Building fire, so there was this Fire Safety (Commercial Premises) Ordinance that was issued after the Garley Building which mandated sprinklers, emergency lighting, fire doors, all of these, so there's lots of good effects of that that happened. They also prohibited combustible materials in lift shafts and required sort of like barriers to fire spread, so not allowing a continuous flow in the well.

So those are good things that were done, but this was not -- this was seen as a lift well-specific issue. People did not see that there could be other situations

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like that, where a similar kind of fire that happened in Wang Fuk Court, that this could apply to those situations as well, and if that had been foreseen, then you could have prevented such a situation.

PROF JIANG LIMING: I think if you refer to Grenfell, actually there was investigation of seven years. One of the main conclusion is that it's at risk if you only let the materials pass the individual standards or testing standards, because the initial standard for testing the cladding materials of Grenfell is just to have a flame impinge on the outer surface of the cladding material and then the fire flame did not actually sustain, then it passed the standards. But the realty is that, as I mentioned, a kitchen fire underneath the cladding material ignited the middle layer, which is polystyrene board for insulation purpose, and then the fire actually propagated inside the chamber of the cladding material or the insulation board.

PROF ASIF SOHAIL USMANI: The internal material was polystyrene but this was completely covered with aluminium, but the fire, when it came out from the kitchen, deformed the aluminium and exposed the internal, because the fire obviously distorts material because of the stressors that it induces to materials. So that's how it exposed and that caused the -- and once

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it spread, then it did it to all of the panels.
PROF JIANG LIMING: After Grenfell, they actually proposed to overlook at all the standards, whether they are appropriate, and it's just really we need to look at the system level of responses, fire responses, rather than just looking at the particular material, whether that passed or could not pass the standard.
Similar to Wang Fuk Court again, if you only look at the fire retardancy of the safety net, it still bears some risk. So we have to look at the overall when we consider the re-entrant geometry and the existence of combustible materials.
THE HON MR JUSTICE DAVID LOK: So what you are suggesting, Professor, that regulation by itself is not the end?
PROF ASIF SOHAIL USMANI: That's right.
THE HON MR JUSTICE DAVID LOK: Even if they pass regulations, it may still cause -- but try to make us more optimistic. Because otherwise, if law cannot stop this, then you are actually proposing an actual project you have to have a risk assessment.
PROF ASIF SOHAIL USMANI: That's right.
THE HON MR JUSTICE DAVID LOK: That is what you are suggesting.
PROF ASIF SOHAIL USMANI: Absolutely.
PROF JIANG LIMING: I think that's actually the suggestion

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from Grenfell. A regular review of the standards for unseen kind of fire risk.
THE HON MR JUSTICE DAVID LOK: In particular, when there are a lot of residents living in the building, which is a consequence -- a risk, I think this is one of the parts we have overlooked in the past, because of the consequences.
PROF ASIF SOHAIL USMANI: Yes.
THE HON MR JUSTICE DAVID LOK: We have construction fire building but they are usually -- usually it's a construction site, no one is living there. As I mentioned before, these type of renovation works was carried out in a site where a lot of people were actually living there. So that's why I mean this is one of the risks that we may perhaps -- in the risk assessment we have overlooked the consequences part.
PROF ASIF SOHAIL USMANI: That's correct. The other aspect that should perhaps be highlighted is the change that happens continuously. New technologies come in, new materials come in. That means you need to keep reviewing all these things. You cannot rely upon old standards because standards become obsolete as well.
Grenfell is, again, a very good example because they sort of clad this building with these materials, one for the reason of aesthetics, but one of the other main

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reasons as energy conservation. So there were these environmental, green kind of considerations that are obviously also very important in Hong Kong, that we want to also have this carbon neutrality and these kind of -- sometimes these kind of things also then take you in directions which then exposes you to greater fire risk, which is exactly the case of Grenfell.
Because things keep changing, we cannot, unfortunately, stop. We have to keep reviewing things; as any new stuff comes in, we need to look at it.
MR VICTOR DAWES: Then can I summarise it in the following proposition. One is given the re-entrant is particularly high risk, for the short run, just try to avoid any combustible materials.
PROF ASIF SOHAIL USMANI: That's right.
MR VICTOR DAWES: Two, some sort of risk assessment.
PROF ASIF SOHAIL USMANI: Yes.
MR VICTOR DAWES: You're not suggesting that you ban combustible materials for all facades because if there's no re-entrant, the level of risk is very different.
PROF ASIF SOHAIL USMANI: That's right.
MR VICTOR DAWES: And, three, what you were discussing with the chairman, we look at new materials to see if there's anything else that can be substituted.
PROF ASIF SOHAIL USMANI: Yes.

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THE HON MR JUSTICE DAVID LOK: But is it right that since you are so -- keep updated to what happened in Grenfell, isn't it right also because of the very strict requirements or regulations, that imposes a lot of hardship on the developers and as a result a lot of developers cannot finish the projects? Is that true?
PROF ASIF SOHAIL USMANI: I do not really know from the UK. I mean, this is stuff that we have been researching recently. We have been obviously aware of all the changes that have taken place, but I'm not really aware -- because they have certainly mandated non-combustible materials on all facades, and that means that the cost of this could almost go up to 10 times.
THE HON MR JUSTICE DAVID LOK: I think you would agree --
PROF ASIF SOHAIL USMANI: So that is a big issue.
THE HON MR JUSTICE DAVID LOK: I think you would agree with me that the approach we should take is that we cannot make it full-proof and use all costs, but we really have to look at the risk and assess the risks from a different angle.
PROF ASIF SOHAIL USMANI: Case by case.
THE HON MR JUSTICE DAVID LOK: And putting at a very high-risk project.
MR VICTOR DAWES: If we can wrap up by saying -- the sense I got from you is when we talk about -- when you

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discussed with the chairman risk versus consequence, of course there's no -- you can't put a price tag on human life, but we have also got to be practical.

PROF ASIF SOHAIL USMANI: Yes. That's right.

MR VICTOR DAWES: Thank you.

PROF ASIF SOHAIL USMANI: Thank you.

THE HON MR JUSTICE DAVID LOK: Do you need some time to consider what to ask and also maybe the Government want to take some time?

MR CALVIN CHEUK: Maybe we ask for five minutes.

THE HON MR JUSTICE DAVID LOK: I'll give you 10 minutes.

MR CALVIN CHEUK: Thank you.

THE HON MR JUSTICE DAVID LOK: Because I think you may have to consider a lot of things to ask, recommendations, and also to the other parties.

In the meantime, can I also ask the parties to consider whether the proposal I made just now about try to upload the few recommendations as soon as possible --

MR VICTOR DAWES: Yes.

THE HON MR JUSTICE DAVID LOK: -- to see whether there's any views from the Government or possible implication about early release of these materials.

So can I ask you to consider this as well during the adjournment?

MR VICTOR DAWES: Thank you.

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THE HON MR JUSTICE DAVID LOK: So 10 minutes.

(12.07 pm)

(A short adjournment)

(12.18 pm)

MR CALVIN CHEUK: Chairman, first of all, we have no objection to the uploading of the recommendation in the PowerPoints. The Government will certainly study them in detail and will collate views from various departments.

THE HON MR JUSTICE DAVID LOK: I think this is only not our final recommendation, it's only that we promote some discussion. We are also writing to some of the trade associations and we are still waiting for their recommendation. So if they learn about the recommendation of our experts, then it can promote more discussion and I hope it would be -- and I don't think it would prejudice the Government in subsequent prosecution or whatever. So that's why I suggest that, at least for these few slides, they should be uploaded as soon as possible. Agreed?

MR CALVIN CHEUK: Agreed.

THE HON MR JUSTICE DAVID LOK: We will try to upload it today.

MR CALVIN CHEUK: I understand Mr Tam has a few questions.

Examination by MR JEFFREY TAM

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MR JEFFREY TAM: Yes. I only have a few questions on the recommendation.

Professors, I represent some of the residents of Wang Fuk Court. May I invite you to look at ER3/2252, which is your expert report, 7.3, that is about recommendations that can be implemented with immediate effect. May I invite you to turn to 2254, subparagraph (g). In fact, you mentioned it already just now in your PowerPoint slides, about the regulatory bar should be raised where this is considered unavoidable by providing fool-proof safety procedures for ensuring occupant safety in the event of a fire.

My question is about the redundant FSI systems, because here you also mention about installing redundant FSI systems as part of the temporary works undertaken.

In other part of your expert report you also gave an example about the sprinkler systems. So may I ask whether it is possible for the temporary sprinkler systems to be part of the -- as part of the redundant FSI systems to be included as an immediate recommendation?

PROF ASIF SOHAIL USMANI: That's a good question. Apparently there are sprinkler systems for these kind of temporary works used in the mainland. So I think in that sense it could potentially be done as an immediate

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recommendation. Or if you can't do that, then perhaps don't use combustibles.

MR JEFFREY TAM: I see. So technology-wise it is already available?

PROF ASIF SOHAIL USMANI: It is there.

MR JEFFREY TAM: I see. Then is there any other redundant FSI systems that can be implemented immediately?

PROF ASIF SOHAIL USMANI: I guess this is kind of personalised alarms and other kind of suppression systems which are specific to the temporary works rather than, say, the stuff that's inside. We need to think about what we can do but I guess these are some of the basic ones.

PROF JIANG LIMING: I can -- FSI is a fire services installation, including like detection, fire alarm and also suppression systems. So there might be some -- because normally we have FSI for internal fire development kind of suppression, but here, in the facade scenario, external fire scenario, especially for the re-entrant, as we mentioned, the critical event of the re-entrant fire, so if you have any kind of maybe water-based suppression to extinguish or to suppress the initial fire, that may be -- and also the detection. If you have the detection and alarm system focusing on the external fire scenario, that would be also helpful. And

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also there are --
PROF ASIF SOHAIL USMANI: Perhaps expanded foam or something like that, that suddenly, you know, you have some kind of fire detection, fire happening which is growing fast, you could have some expanded foam-type material that sort of smothers the fire. We are suggesting the redundant FSI systems that are already available that could be used and I think that perhaps -- we are not experts in the area, but we are potentially --
THE HON MR JUSTICE DAVID LOK: Can I ask from a layman's point of view, where do you get the water to suppress -- as a temporary device to suppress the fire? Either it's a sprinkler in the re-entrants or in the apartment. Where do you get the water from?
PROF JIANG LIMING: For, like, a sprinkler, water-based FSI, actually there are different types. One is actually like the hose system throughout the building, that is like the typical sprinkler building or fire hydrant hose reel system. Another -- there is actually individual room protection systems that actually have -- especially the machine room, they have typically like a water mist system. They are individually installed. It's storage of water beside --
PROF ASIF SOHAIL USMANI: Localised.
THE HON MR JUSTICE DAVID LOK: Thank you very much.

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MR JEFFREY TAM: Just one more question. Page 2255, 7.4.2. Is there any example for these type of materials, less combustible, lightweight protective materials that are available?
PROF ASIF SOHAIL USMANI: Like I mentioned, after the Grenfell event in 2018, they have mandated no combustibles for certain kind of buildings like apartment buildings and hospitals, student accommodation, things like that, that there shouldn't be any combustibles for buildings over 18 metres high. And so they -- for that, if they want to do some renovation, then there are new materials available such as -- there's silicone-wrapped fibreglass materials, which is quite lightweight and non-combustible, that are being used and there's a Euroclass set of materials, textiles, new kind of tarpaulins which are being used.
These are of course more expensive, but they are totally non-combustible. And steel wire -- stainless steel, really, stainless steel wire and also galvanised stainless steel wire. These are multiple materials available in Europe which are now being used in the UK, for example.
MR JEFFREY TAM: So technology-wise it's also --
PROF ASIF SOHAIL USMANI: It's available.
MR JEFFREY TAM: I see.

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Those are the questions. Thank you.
THE HON MR JUSTICE DAVID LOK: Yes. Thank you.
I think for the benefit of the public, in a lot of different other enquiries, like, so far as I remember, the Garley Building fire, they spent months in discussing recommendations. If there's a public -- I mean statutory inquiries that we may have to spend -- I think Mr Justice Woo actually made some comment about the necessity of conducting a detailed examination of these recommendations because I don't think we are here as technical people to spend months to discuss on these issues. That may be required under statutory inquiries.
So I think we, as a non-statutory inquiry, try to find out the path, to set out the path, rather than to spend months to hear in a legal proceeding to deal with these issues. So that is one of the observations, after listening to that, that reminds me of what happened in some of the past statutory inquiries.
Of course the professor knows a lot about these.
PROF ASIF SOHAIL USMANI: Yes.
Examination by MR CALVIN CHEUK
MR CALVIN CHEUK: Prof Jiang, Prof Usmani, thank you for coming here. It's my first time to face two witnesses at the same time so what I propose is I ask a question. Please feel free if either of you want to give the

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answers, or anyone wants to supplement the answers. That's fine with me.
Just as a starting point, is it fair to say the Government team of experts and the IC team of experts have reached substantially similar conclusions in their respective expert reports? Is it fair to say that?
PROF ASIF SOHAIL USMANI: I think it's fair to say that, yes.
PROF JIANG LIMING: Yes.
MR CALVIN CHEUK: For the convenience of the Committee and the public, what I would first like to do is to go through some of the important points of agreement. If we go to ER3/88, paragraph 6.2, internal page, here you mention:
"The re-entrant geometry created an uncontrolled chimney effect."
The Government team of experts also mentioned this contributing factor. You have seen that in their report; correct?
PROF JIANG LIMING: Yes.
MR CALVIN CHEUK: I can give you a reference. ER2-2/1271. This is Prof Yuen's final report. We can see at 4.2.3.
PROF ASIF SOHAIL USMANI: That's right, yeah.
MR CALVIN CHEUK: "The confined geometry of the re-entrants intensified the situation by restricting heat

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dissipation."
That's our first important agreed point.
The second agreed point, if we go back to ER3, internal page 88, paragraph 6.3.3, here you say:
"We agree with Professor Richard Yuen that if the safety nets and canvasses at Wang Fuk Court were fire-retardant, the initial fire may have self-extinguished and not caused the combustible materials inside the re-entrant to catch fire so the fire might not develop and the fire spread would have been much more minimal in Wang Fuk Court and less buildings would have been on fire ..."
So we are talking about the effect of the fire safety net in respect of both primary fire spreading and the secondary fire spreading; correct?
PROF JIANG LIMING: Yes, correct.
PROF ASIF SOHAIL USMANI: Yes. We just -- I think I had explained earlier in response to Counsel Dawes' question that the "might" part is very important here, that there's an uncertainty element, that as long as -- so we agree with the conclusion, but we do not want any of this -- do not want this to be some kind of an implied sort of follow-up that if the nets are fire-retardant then the risk would disappear. That we would not agree with.

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But in this particular case, yes. The event may not have transpired in the way that it did in this particular case, but that doesn't mean that it would not happen in another case.
MR CALVIN CHEUK: I understand that. Let me put it slightly different. Both teams of experts agree that the lack of FR quality in the safety nets and the canvasses is an important factor in the causation of fire in this instance. That would be fair; right?
PROF ASIF SOHAIL USMANI: That would be fair.
MR CALVIN CHEUK: Then we move on to page 89, paragraph 6.4.2. Here in the last sentence, you say, from the sixth line from the bottom of the paragraph:
"We agree with Professor Richard Yuen's key observation (12) that although the total heat release from foam boards was minimal due to their small mass in re-entrant fires, they significantly promoted fire spread to other combustibles due to their ease of ignition and production of burning droplets, and additionally released toxic smoke, further increasing fire hazards ..."
So I think it is fair to say both teams of experts agree the use of foam boards to cover the windows is another important factor in the causation of fire and heavy casualties, despite their small masses. That's

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correct; right?
PROF JIANG LIMING: Yes.
THE HON MR JUSTICE DAVID LOK: For the purpose of the record, if no apparent answers from them, that means both professors agree because they are nodding their heads. Because we have both professors giving evidence at the same time, so that's why for the purpose of the record, if there is no clear audible answers from them, that means both of them are nodding their heads in agreement.
PROF ASIF SOHAIL USMANI: Yes, we don't want to speak at the same time.
THE HON MR JUSTICE DAVID LOK: I see. I think for the purpose of the record, we have to be -- just make clear. So we just want to put it on record that that is what actually happened and there is no misunderstanding whatsoever.
MR CALVIN CHEUK: Thank you, chairman. Let's move on. Another point, page 90, internal page, paragraph 6.5.3. Here there's another agreement. You say:
"We agree with key observations (5) and (13) of Yuen's final report, ie fire and smoke could infiltrate the staircase through the gaps and holes in the moveable boards for worker access openings, even before they were completely burned out, and that the IFITF's test results

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indicate that both the wooden board and aluminium composite panels are unsuitable for protecting the staircase openings."
Again, both teams of experts agree that the alteration of the staircase windows into access openings for workers is also another important factor in the causation of fire and heavy casualties; is that correct?
PROF JIANG LIMING: That is correct.
MR CALVIN CHEUK: Thank you. Now we again move on to page 89 internal page, paragraph 6.5.1. Here, just a little bit clarification. You refer to the wired glass windows on staircase and lift lobby external walls. You probably were not -- they were non-fire-rated. You probably have heard the evidence given by the Government's team of experts. The wired glass at the staircase have been changed into fire-rated. So taking into account this fact, that will not change your conclusion that the alteration of staircase windows into access openings for workers is an important factor. That's the causation --
PROF ASIF SOHAIL USMANI: That's correct, yes.
MR CALVIN CHEUK: Thank you. Now if I can move to a separate point about in your PowerPoint presentation we have just seen, ER6/2710. This is a computer model that you start with a fire at the bottom, we see there is a

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reference to "Localised fire to initiate re-entrant fire", HRR 4,140 kilowatt. Then you test four scenarios to see how those materials affect the spread of the fire within the re-entrant area.

What I try to focus on is the intensity of the initial fire, 4,140-kilowatt. If we compare this with the Government's report, if we go to ER1/93, here I think you have heard evidences the government's experts used two types of fire size. One is below 1.5 megawatt and one is 2.5 megawatt. The first type is considered to be what they call small initial fire. The second type is called, they refer to it as a large initial fire.

Just to be clear, the 4,140 kilowatt equals 4.14 megawatt.

PROF ASIF SOHAIL USMANI: That's correct, yes.

MR CALVIN CHEUK: In short, your initial fire use is almost double the size of a fire categorised by the Government experts as large fire. In this regard, let me -- let's understand the results in this important context. The government results also show in large fire context, ie more than 2.5 megawatt, the FS qualities cannot protect the building. But -- that's agreed between two teams; correct?

PROF JIANG LIMING: Mm-hmm.

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MR CALVIN CHEUK: What your model has not shown is actually what happened when the fire is relatively small, as categorised in the Government's expert report, ie below 1.5 megawatt. Whether the FS quality will come into play, whether that will be sufficient to ignite the bamboo; is that correct?

PROF JIANG LIMING: Yes. Actually I need to clarify that why we're using 4.04 megawatt, that is actually we try to show the re-entrant fire development for that purpose, but also we have the 75 models initiated by 2-megawatt fire. And I think we share the same question with Professor Richard Yuen; that is, like what is the size of the initial fire that is able to trigger the re-entrant fire. And his large-scale test in Sichuan, I think, well demonstrated that even the fire size below 1.5 megawatt is still able to trigger the re-entrant fire. I think this is a complementary kind of finding.

MR CALVIN CHEUK: I agree with that. But the important point about the less than 1.5 megawatt is that if you use FS materials, such as safety nets and canvases, actually the fire will self-extinguish. That's really the key point, key finding; right?

PROF JIANG LIMING: Yes. From his -- yes.

MR CALVIN CHEUK: Which has not been shown to be incorrect, in your report.

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PROF ASIF SOHAIL USMANI: That's right. I think we have already agreed on that one.

PROF JIANG LIMING: Mm-hmm.

MR CALVIN CHEUK: So now if I can switch to a slightly different topic about the non-compliance of Wang Fuk Court with CoP 1976, which you mentioned in your report. If we go to ER3/84, paragraph 5.3.6. Then we see the table 5.1. I think this table, you set out what's compliant and what's not compliant. The main items here is about item 8 and item 9; correct?

PROF ASIF SOHAIL USMANI: That's right.

MR CALVIN CHEUK: And the code, if we look at the table at the top, there's a code -- if we go to the table at the top, the third column says "Code requirement". And there's a star there. If we go to the bottom, we see that the code of practice, you refer to the code 1976.

PROF ASIF SOHAIL USMANI: Yep.

MR CALVIN CHEUK: So that is the benchmark we are measuring against. To be fair to both of you, is it correct that both of you only have come across this code for the first time in this investigation?

PROF ASIF SOHAIL USMANI: That's correct, yes, for us.

PROF JIANG LIMING: Yes.

MR CALVIN CHEUK: That's fair. So if we look at item 9 first, it's related to wired glass windows on external

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wall of lift lobby and staircase. And you say that:

"According to the code, half an hour fire rating if WGW is located in a light well, and light well is a four-sided enclosed space, and Wang Fuk Court blocks' re-entrants are open on one side, so Wang Fuk Court does not require FFRR."

As I understand, what are you trying to say here is that assuming the wired glass on the external walls of lift lobby and the staircases do not have half-an-hour fire rating, still, strictly speaking, they do not breach the code, as the half-an-hour fire rating only applies to a four-sided enclosed space. Do I understand correctly?

PROF JIANG LIMING: Yes.

PROF ASIF SOHAIL USMANI: That's correct.

MR CALVIN CHEUK: I just wish to explore with you one further point. According to Mr Lam's evidence on Monday, if we can pull up his transcript on Monday, page 57, English version, please. Mr Lam says this, starting from line 5:

"There was no fire-retardant design. However, it said wired glass. Back then, for most housing estates, wired glasses have been adopted for a lot of buildings. When these wired glasses are burned, the glass panels would not fall off. The wire would hold the glass

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panels in position even if they are burned."
Here's the important bit:
"In the industry, these wired glass panels have a fire resistance period of 45 minutes."
Would you agree with him?
PROF ASIF SOHAIL USMANI: Yes, I think so, yes.
MR CALVIN CHEUK: So actually, technically, that's why regarding item 9, actually Wang Fuk Court is fully compliant with the code.
PROF ASIF SOHAIL USMANI: Correct, yes.
MR CALVIN CHEUK: Thank you. Now, we move to item 8. We go back to item 8. It's related to staircase door lobby, and you say according to the code:
"Building height [more than] 30 m, require a lobby between internal corridor and staircase."
In the case of Wang Fuk Court, no lobby protected for Wang Fuk Court. And then you say:
"The purpose of lobby is to prevent smoke spreading from corridor to staircase when an occupant opens the lobby doors for evacuation. For the fire at Wang Fuk Court, smoke entered into the staircase from external windows or worker access openings. Accordingly, the lobby would not help in this circumstance."
As I understand, you considered that there was a breach of the code, but even if there had been no

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breach, it would not have helped because the smoke would have entered into the staircase --
PROF ASIF SOHAIL USMANI: From external.
MR CALVIN CHEUK: -- from the opening, in this case.
I understand the causation point, but I'd just like to clarify with you on the breach point.
Now if we go to B16/6367. This is the code, basically, 1976 code. If we look at section 17 of this code, I think that's -- you have looked at this section, in particular subsection (6), it says:
"The exit route from any room, flat or storey to any part of a staircase which serves a storey more than 30m above the level of ground shall be through a lobby. Such a lobby shall be either
(a) a protected lobby, or
(b) a lobby open to the external air on at least two sides.
Provided that this paragraph shall not apply to a staircase to which access is from a balcony approach."
The issue we are discussing is related to subparagraph (a), whether there is a protected lobby in the case of Wang Fuk Court; correct?
PROF ASIF SOHAIL USMANI: That's right.
MR CALVIN CHEUK: Let me try to explain. Because usually it's assumed a fire is started within a unit.

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PROF ASIF SOHAIL USMANI: That's right.
MR CALVIN CHEUK: If the fire is started within a unit and if there is no protected lobby, if the fire directly spreads to the protected staircase, when the occupant try to escape and open the protective door, the smoke will leak or seep into the protected staircase and that's why you raise the concern about the breach of the code and these the rational behind the code, essentially?
PROF ASIF SOHAIL USMANI: Yes.
MR CALVIN CHEUK: Okay. Now, if we move to page 6373, there's a diagram here called "Diagram 8". First of all, can I ask you, have you looked at this diagram before?
PROF ASIF SOHAIL USMANI: Yes, I have.
MR CALVIN CHEUK: It says this diagram:
"This diagram illustrates only paragraph 17(6)(a) of the code."
Which is directly in issue. So what we can see from the diagram, what is says -- first of all, we see an entrance lobby, and then we see an "L", which is the lift enclosure. It describe the location of the lift. And then we see the letter "B". Basically they are the self-enclosing door with half-an-hour fire resistance. They are supposed to mean the doors to the individual

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units.
PROF ASIF SOHAIL USMANI: Mm-hmm.
MR CALVIN CHEUK: Which is not shown in detail here.
PROF ASIF SOHAIL USMANI: Mm-hmm.
MR CALVIN CHEUK: But there's a B with apostrophe 1, to the staircase, which is the door opening up to the protected staircase.
So what here it says the purpose of this diagram, it says that if the lift lobby forms or constitutes a protected lobby as shown in this diagram, then section 17(6)(a) will be complied with. That, you agreed with my interpretation; right?
PROF ASIF SOHAIL USMANI: I think so, yes.
MR CALVIN CHEUK: Now our question is whether the lift lobby of Wang Fuk Court complies with this diagram. So if we look at ER3/53, your figure 4.1. Now, what it shows is the lift lobby of Wang Fuk Court and also the door type connected to this lift lobby. You can see that from this diagram the door types are either D1 or D12; is that correct?
PROF ASIF SOHAIL USMANI: D1 or D12? Which? Oh, you mean the -- yeah, the unit doors. Unit doors, yeah.
MR CALVIN CHEUK: So there are two types of unit doors.
PROF ASIF SOHAIL USMANI: Yeah.
MR CALVIN CHEUK: It's either D1 or D12.

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PROF ASIF SOHAIL USMANI: Mm-hmm.
MR CALVIN CHEUK: If we go again your report, page 53, 4.1.4 below. What you say is:
"On the submitted building plan it is identified as D1. Others specified as a 'single leaf 50mm thick solid core flush door (Self closing).' This description aligns with a standard fire-rated door; a 50mm solid core timber door of this type typically provides a fire resistance rating of more than 1.0 hour."
So the D1 door actually complies with diagram 8.
PROF ASIF SOHAIL USMANI: You mean the diagram you earlier showed from the code?
MR CALVIN CHEUK: From the code.
PROF ASIF SOHAIL USMANI: Not really, because if you have -- that door is a separate door, the B door, and there will be unit doors which are in addition to that. That would be my understanding. So you are mixing the unit door with the separate -- that would be also a lobby door. The B'1 is also a lobby door, right? It's not a unit door.
MR CALVIN CHEUK: If we go back to diagram 8, please.
THE HON MR JUSTICE DAVID LOK: I don't think --
PROF ASIF SOHAIL USMANI: I don't think this is important, really.
THE HON MR JUSTICE DAVID LOK: I think in a way, we are

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not -- if the Government is concerned that the Committee would make a finding that it's not compliant, I don't think we will.
PROF ASIF SOHAIL USMANI: We are not. We are not.
THE HON MR JUSTICE DAVID LOK: We are suggesting that there may be different interpretations. So I think we are happy with that. If we are going into detailed interpretation as to whether this fulfil or not, since in this particular case it doesn't make a difference, we will not make any findings on that particular question.
MR CALVIN CHEUK: Thank you, chairman. In that case, I will not push further.
THE HON MR JUSTICE DAVID LOK: We note that there will be a difference of interpretation by the Government and the experts. That's it. We are not going to -- since in this case it does not make a difference.
MR CALVIN CHEUK: Finally, if we go back to your report, about recommendations, if we look at your section 7, page 92. Here are some -- the starting section of your recommendation.
As I understand, actually you have also explained this morning, these recommendations are meant to be interim in nature and will need further considerations.
PROF ASIF SOHAIL USMANI: Yes. Mm-hmm.
MR CALVIN CHEUK: Just to again also clarify with you, these

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recommendations are suggested from the perspective of a fire engineering expert.
PROF ASIF SOHAIL USMANI: That's right.
MR CALVIN CHEUK: And you don't expect the Committee to follow them blindly, and as the Committee might have to take into account other socioeconomic considerations.
PROF ASIF SOHAIL USMANI: Absolutely. This is our -- essentially a view from our professional background, yeah.
MR CALVIN CHEUK: Thank you. So I just very briefly go through some examples. If we go to page 94, paragraph 7.3.1(b). Here you talk about the suggestion of a prohibition of any combustible materials in re-entrant spaces. Of course, I suppose this will be subject to a lot of other considerations, whether the space can fit in, for example, steel scaffolding, the cost increase, et cetera.
PROF ASIF SOHAIL USMANI: Yes.
MR CALVIN CHEUK: And another example, if we go to 7.3.1(h), next page. Here you suggest:
"All external windows of staircases and lift lobbies that face into re-entrant spaces or are within 6 metres of any unprotected opening shall be retrofitted with fixed, fire-rated glazing, achieving integrity and insulation of not less than 60/60 minutes, in accordance

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with clause C9.7 of FS Code 2011."
You would agree that the buildings, when they were designed and constructed, they were done according to the prevailing codes and regulations at the time. And these codes and regulations will be updated and improved over time.
PROF ASIF SOHAIL USMANI: That's right, yes.
MR CALVIN CHEUK: So in general, occupants are not required to change their installation of the buildings once the codes and regulations are changed.
PROF ASIF SOHAIL USMANI: Mm-hmm.
MR CALVIN CHEUK: That's the general position. Because otherwise, a lot of time and cost will be incurred.
PROF ASIF SOHAIL USMANI: I understand, yes.
MR CALVIN CHEUK: So again, this suggestion depends on a lot of other feasibility studies.
PROF ASIF SOHAIL USMANI: I understand, yes.
THE HON MR JUSTICE DAVID LOK: You can be rest assured. The comment I make in fact a few days ago, that whatever recommendation that we make will be based on different considerations. And I think the most important thing is we have to change our culture and to look at our risk --
PROF ASIF SOHAIL USMANI: That's right.
THE HON MR JUSTICE DAVID LOK: -- reassess our risk. In a way I think Grenfell taught us even with all the best

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legislation, it can still happen.
I think what we are trying to do is we put our heads together and reassess the risks and then we try to make it as best as we can and we cannot make it too ideal in that sense. Of course the experts from the academic area, they have other consideration, but you can rest assured that what we are suggesting is that we set the path forward. It will be debated, stakeholders' interests, whatever, but I think what we are trying to do is try to raise awareness of the whole public about the risks associated with this kind of project in the future, especially with many people living, still living in the buildings.
As I repeatedly said, it has given us a very hard lesson that we really have to learn from this lesson.
I think you agree with that.
PROF ASIF SOHAIL USMANI: Absolutely, yes. Thank you.
MR CALVIN CHEUK: I'm grateful for chairman's indications. I have no further questions.
THE HON MR JUSTICE DAVID LOK: Thank you.
Any other stakeholders' questions?
Any questions in re-examination?
MR VICTOR DAWES: Nothing from us.
THE HON MR JUSTICE DAVID LOK: Thank you very much.
Thank you, professors, I think your evidence has

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helped us to understand how the fire spread and also in particular in relation to your recommendations. I think it will spark off or provide the seed for further discussion in the future. Thank you very much for your assistance.
(The witnesses were released)
(12.57 pm)
THE HON MR JUSTICE DAVID LOK: Now we can switch back to Chinese. We have already heard the last witness.
So do you have anything to say?
MR VICTOR DAWES: Chairman, I have two subjects. First, later on we are going to discuss with the relevant parties and then we will be reporting to you. As to the uploading of the experts' reports online, that's what we are going to discuss, other than the few pages that you just referred to.
THE HON MR JUSTICE DAVID LOK: I'd also like the public to know many of the documents, uploading them would also involve a lot of considerations, for example, the implication on future criminal proceedings and also privacy concerns because we also have to bear in mind some residents' personal privacy data might also be disclosed and therefore we will have to be very careful about that. But then, as far as possible, we try to be as transparent as possible, we try to open up. But then

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we will also need some time to deal with that.
MR VICTOR DAWES: We are waiting for further instructions. We can also disclose it later.
THE HON MR JUSTICE DAVID LOK: On 15 July, I've already said that we are going to have the final submissions lasting for three days and then for the details, that will be announced later. With regard to the final submissions to be submitted, so that would be on 6 July, so the reports will have to be -- the submissions will have to be made available and time is very tight and I'm also grateful to all the parties for your cooperation because we haven't given you a lot of time, but then I'm grateful to you for your cooperation.
We have already told you earlier on as to what our plan is. I hope that you can tie in with our timetable so that we can complete our investigation report as soon as possible. So for those who have attended, all the involved parties, I'd like to express my gratitude to you for your cooperation.
If there is nothing further, then that's the time when we adjourn. Next time we come back again is for the final submissions. If you have any supplementary information that you'd like to submit, please make use of the time that is left, and also some professional groups are also making some suggestions and we are also

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very grateful to all the parties for their cooperation with our very tight timetable.
Once again I'd like to thank you again and then we will wait until 15 July when we meet again. So today's hearing is hereby adjourned. Thank you.
(12.59 pm)
(The hearing adjourned until 10.00 am on Wednesday, 15 July 2026)