Combustible cladding doomed Grenfell Tower within 10 minutes of initial fire

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The Grenfell fire inquiry continues to hear evidence confirming that the renovation of Grenfell Tower turned it from an inherently safe building into a death trap.

The renovation carried out by the Conservative-controlled Royal Borough of Kensington and Chelsea (RBKC) and its Kensington and Chelsea Management Association was a purely cosmetic exercise, with the aim of making the landmark building more visually pleasing to nearby wealthy residents.

On November 20, the inquiry heard from Professor Jose Torero, who is the John L. Bryan Chair in Fire Protection at the University of Maryland in the US. He is an internationally renowned scientist with an expertise in the dynamics of fires, how they spread and how buildings can be protected to prevent such spread.

Torero explained how the cladding on the building had compromised the compartmentation of the building. High-rise tower blocks are designed so that a fire in one flat will not easily spread to other flats. On this basis, the advice given by the fire services is for residents in a tower block in which a fire has broken out in one flat to stay in place—the "stay put" strategy—and await rescue by the fire personnel.

However, firefighters attending the inferno at Grenfell Tower had no experience of fighting a fire in a fatally compromised high-rise building and initially stuck to imposing the stay put policy. In his testimony, Torero explained that because the fire containment initially incorporated in the building had been breached, it was only around 10 minutes before the fire spread outside to the cladding on the tower. This rendered the stay put policy almost immediately ineffective, endangering the lives in everyone in the building in a matter of just minutes.

The fire started in flat 16 on the fourth floor of the building. It started in the kitchen, but rapidly spread to the outside through a uPVC window. Torero said, "Analysis indicates that a relatively minor, localised fire compromised the uPVC window fittings and ignited one of the flammable components of the cladding by direct flame/plume impingement. From this point forward, the stay put strategy was compromised and evacuation of the occupants was an option to consider."

Fires in high-rise buildings such as Grenfell Tower, said Torero, are an "inevitable and perfectly foreseeable event," which in normal circumstances would be contained. He continued, "Fires are common events, but fires that create significant damage are rare events. … The building is required to respond and deliver…so that a fire of this nature does not progress beyond a kitchen."

In a written report in June, Torero spelled out how the cladding compromised the tower. He wrote: "The tragic consequences of the Grenfell Tower fire highlight the significant shift in complexity that occurs when intricate façade systems are incorporated into high rise buildings…simple standardised tests become insufficient tools. …"

Grenfell Tower was transformed into a tinder box as the result of cost-cutting and outright criminality, with evidence of this provided to the inquiry.

Dr. Barbara Lane, a chartered fire engineer with the Arup engineering and design group, has provided evidence to the inquiry and produced two reports. She told the inquiry last week that a certificate covering the fire safety of the cladding was "factually incorrect." The certificates are issued by the British Board of Agreement (BBA), a construction industry servicing body. The BBA had classed the cladding a Class 0—a building regulation relating to how cladding aids or

hinders the spread of flame. It is the minimum requirement needed for the use of such cladding.

An *Inside Housing* report November 20 noted that Lane "criticised the certificate provided for the panels used in Grenfell's cladding by…BBA. … She said the BBA had relied on 'out-of-date' reports in issuing this certificate.

"Dr. Lane said that only one of the three panels referenced in the certificate which was issued in 2008, has been demonstrated to achieve Class 0."

Lane, it continued, "has found test evidence relating to 14 forms of this kind of panel, nine of which should not be considered as meeting the requirements for a Class 0 rating. These tests, she said, were not submitted to the BBA for the certificate, as they should have been.

"The various insulation and cladding materials used on Grenfell Tower was up to five grades lower than it should have been to comply with basic standards of building guidance, [Lane] has said."

Lane also highlighted how the "crown" installed on the top of the tower had been instrumental in spreading the fire. The material in the crown included combustible polyethylene (PE). She told the inquiry: "It's an architectural feature…just to make the top of the building look nice I suppose. … Once the flames got up to level 23 in the first place above flat 16 (where the fire started), it appears then to have been able to travel horizontally in both directions through the crown."

Asked what could have been done to prevent the horizontal spread of the fire around the top of the building, she replied, "The only way you could stop the crown from being a flame front on its own is to not clad it in a combustible material."

Also giving evidence to the inquiry was Professor Luke Bisby, the Arup Chair of Fire and Structures at Edinburgh University. He spoke on November 21 on how the fire dangers of using PE, which was present in the panels, had been known since the 1970s. He said, "If a fire is ignited in a cladding system such as this—made from these materials—under any circumstances we have to expect it spread quickly and catastrophically because of the nature of these materials."

He described how the PE could burn and then melt, helping to quickly spread the fire. "The general principle that a thermoplastic will melt and drip and burn quite vigorously is very clearly highlighted in any of the reference texts that one would expect a competent fire safety professional to have at least skimmed if not know quite well," he said.

Asked by the QC to the inquiry Richard Millett if it would be correct to say a body of evidence on the danger of using thermoplastic materials to cover buildings had been known about for at least 30 years, Bisby replied, "Absolutely."

The latest inquiry sessions took place amid confirmation of how unsafe most residential tower blocks in the capital are and, by extension, those in the rest of the UK.

A survey initiated by the Labour Party revealed only 4 percent of the around 800 high-rise accommodation blocks in London have sprinklers installed. This is despite the body of evidence showing the high effectiveness of sprinklers in suppressing fires in high-rises.

Following the Grenfell Tower fire, the Conservative government pledged to do whatever was necessary to make tower blocks safe. This was a sop to public anger, as not only have no funds been made available to councils to install sprinkler systems, but many councils have not been provided with funding to remove and replace tower blocks that are clad in highly flammable material.