Grenfell Tower Fire

Public Inquiry

In absentia expert witness

of

Robert F. Beck

Introduction

My name is Robert Frank Beck. I worked in local government from 1968 to 1984.

My first appointment was with Walton & Weybridge UDC in the Town Planning Office, where my duties included attending the public counter dealing with both planning and building regulation enquiries.

Listening to building control officers explaining issues regarding all sorts of developments was the start of my education in this field, apart from understanding of structures and the strength and properties of materials via two years of studying mechanical engineering at degree level.

In 1969 I obtained the position of Town Planning Trainee at Woking UDC, which later became Woking Borough Council. I rapidly progressed to Senior Planning Officer in 1975, having obtained the Intermediate Qualification of the Royal Town Planning Institute.

The studies involved in this qualification included the many types of materials used in building construction.

By the time I had to retire on grounds of ill health in late 1984 I had dealt with approximately 200 planning appeals some of which involved my giving evidence of expert witness at local public inquiries. One of these involved the largest single development in Europe at the time.

In those years, plans submitted to the Council for approval were invariably the same for both town planning and building control consideration. Thus my learning of building control issues continued, and not only regarding applications subject to appeal, because I was usually asked to calculate the floor areas of larger buildings, and took an interest in details such as extra staircases required.

It is a very important incidental that when studying maths, applied maths and physics at Brooklands College, where I received the second year prize for physics in 1964, I learned that finely divided aluminium was used in the high explosive, amonal.

At Brooklands College, with the help of a very intelligent friend, I carried out a private study of Einstein's relativity. I was able to return to this myself following a revelation in 2003 that appeared to confirm that the conclusions I reached in the early 1960s were correct. I now have enough observational, experimental and computer simulation evidence in support of this, from neutrinos to black holes and beyond, to claim the role of independent theoretical physicist, even though I hold no degree in physics.

The Woking News & Mail have referred to me as a renowned theoretical physicist because they know that I have beaten planetary physicists to the correct prediction of things in the solar system. I have also beaten Stephen Hawking to the verified prediction that new stars can form from material ejected by black holes.

My studies since have shown that aluminium is a very unusual material, and my explanations in particle physics, that go further but fit with the standard model, provide some answers why. I have done considerable further reading up on aluminium since the Grenfell Tower fire.

A. Facts

1. Facts relating to the Grenfell Tower fire

1.1 By the evening of the 14th June I had a good idea of why the fire spread so quickly. As soon as I knew that the cladding used in the refurbishment contained aluminium, I had serious suspicions that this played a significant role in how fast the fire spread, based on something I learned over fifty (50) years ago! Aluminium in finely divided form has long been used the the high explosive, amonal, because it is a fire accelerant. I know now that it is currently also added to jet engine fuel to help the fuel burn hotter and thus more efficiently

1.2 The same evening, I emailed Jeremy Corbyn and Channel 4 News to say this, and to suggest that whether this applies to molten aluminium also needs investigating.

1.3 It took me about 5 minutes to discover that molten aluminium is explosive in the presence of moisture or other contaminants, and so I emailed these recipients again, and by 8. 30 pm on 14 June 2017, I copied this email to the London Fire Brigade and the London Mayor's Office. See Appendix 1 for copies of these emails, which contain a link to the authoritative source re molten aluminium.

1.4 Surprised that no mention of this was made in the news the following day, or even days, I continued to send emails and letters to other news channels and programmes and to anyone I thought should be interested. See Appendix 2 for copies.

1.5 Thanks to The Times providing further details of the materials and design of the cladding and insulation on page 9 on June 16, I was able to hypothesise the process by which the aluminium melted in an annotated drawing. See Appendix 3.

1.6 This was sent to many of those contacted before, and to my local Council and Fire Safety officer in Woking, where there are existing and proposed tower blocks that could fail current testing. See Appendix 2 for copies

1.7 At the time of writing this on 29 June, no replies to anything in the appendices has been received apart from standard acknowledgements. The Woking News & Mail, however, to whom I copied my letter to Woking Borough Council, included a few lines about my concerns regarding aluminium on page 3 on 22 June, and printed a longer article today, but did not mention that I had said that molten aluminium can explode. They have advised me that Woking's MP, Jonathan Lord has told them that he will study my email to him and raise the issue with the appropriate Minister.

B. Analysis & Opinion

2. Considerations regarding cladding in general

2.1 From Appendix 3, it can be seen that my analysis suggests that it was a combination of materials and design that caused the aluminium to melt.

2.2 From fact 1.3, the melting of the aluminium, in the context of the contaminants produced in the burning of the insulation in the air-gap, and water sprayed in trying to put out the fire, almost certainly were the phased triggers that caused and exacerbated the exceptionally fast spread of the fire.

2.3 If the aluminium melts, as it clearly did in the Grenfell Tower Fire, then the cladding does not comply with the building regulations that require the flammable core to be encased in a non-flammable material.

2.4 Is it reasonable to expect that architects, surveyors, building control, and fire safety officials should anticipate the possibility of the aluminium melting? In my view, yes. Every possibility should be considered, including for instance, a plane crashing into the

side of the building. But all these people should have made absolutely sure that the insulation between the cladding and the building was non flammable. A combination of this failure, and the air-gap creating up-draft, was in my view, the initial reason for the melting of the internal sheet of aluminium.

2.5 Fire testing of panels prior to the Grenfell Tower Fire was inadequate, because until aluminium melts, its coating of oxide makes the metal fire resistant. This applies to molten aluminium until moisture or other contaminants disturb the oxide layer, which is very thin.

2.6 I my view it is grossly negligent in this age of innovation of building techniques, not to check out the properties of materials, and especially before they are used so extensively in terms of surface area and the number of buildings. To do so when so many lives are at risk is criminally negligent.

2.7 But why, might we ask, are government scientific advisers not aware of the potential dangers of aluminium when I have known it for over 50 years and my 1961 Encyclopaedia Britannica has much to say on this subject?

2.8 I think it far more likely that governments make it clear that this knowledge is not for the public to know. Would people happily fly in aircraft made of aluminium if they knew that a localised fire might melt some of the aluminium, which could then explode?

2.9 And aluminium has so many uses now that make it economically important in ways other than aircraft. Professor Christopher Exley of Keele university calls this the 'aluminium age'. But he knows that this comes with both advantages and dangers, because biochemical dangers to life on Earth are known and because all the mechanisms are not fully understood. The greatest danger would be if aluminium oxide were actually used in aerosol geoengineering as some have proposed. Professor Exely has provided evidence to suggest that bees and fish are dying from some unknown sources of aluminium. In fish this could be the result of man made causes of sulphates producing acid rain that releases aluminium from soils into water courses. This, and the effect of acid rain on trees, also rules out the use of sulphates in aerosol geoengineering as a sensible solution to global warming. Governments allowing the use of materials without due regard to possible dangers is not just a threat to the safety of people in buildings, it could damage the whole biosphere.

C. Conclusions

3. Lessons to be learned

3.1 The Grenfell Tower incident, has demonstrated the desperately awful consequences of using materials without understanding these materials adequately.

3.2 This may be through laziness, incompetence, ignorance, or putting financial considerations before public safety.

3.3 It is for this inquiry to judge and to make recommendations.

3.4 My long experience suggests that a return to the judgement of building plans solely by publicly employed officials is one very important thing to consider.

3.5 I hope and suspect that all the evidence presented to the inquiry will result in a call for greater clarity in the Building Regulations regarding the suitability of materials and how they should be tested, the need for alternative means of escape, the proximity of gas and electricity services to means of escape, the need for sprinklers and location relative to any aluminium that may melt, the position of fire doors or other means of controlling the spread of fire, especially from any room that may contain appliances that may catch fire, and the need for regular inspections.

3.6 I also hope that how long it took me to discover that molten aluminium can explode will be a lesson to all those involved in the building industry to do better in researching the properties of the materials they use.

Appendix 1

Copies of emails sent on the evening after the fire

Subject: Fwd: Fwd: Re: Grenfell Tower
Date: Wed, 14 Jun 2017 20:30:31 +0100
From: Robert Beck <robert.beck@ntlworld.com>
To: mayor@london.gov.uk

-------- Forwarded Message --------
Subject: Fwd: Re: Grenfell Tower
Date: Wed, 14 Jun 2017 20:20:15 +0100
From: Robert Beck <robert.beck@ntlworld.com>
To: info@london-fire.gov.uk

See below. Trying to put out the Grenfell Tower fire may have made it worse where aluminium was used in the refurbishment.

-------- Forwarded Message --------
Subject: Re: Grenfell Tower
Date: Wed, 14 Jun 2017 20:10:40 +0100
From: Robert Beck <robert.beck@ntlworld.com>
To: corbynj@parliament.uk, news@channel4.com

From http://www.aluminum.org/resources/electrical-faqs-and-handbooks/safety

Contact with molten aluminum can cause severe burns and create a serious fire hazard. Mixing water or other contaminants with molten aluminum can cause explosions. Explosions can also occur in the aluminum scrap re-melting process due to moisture and contamination in scrap.

These explosions range widely in violence and can result in injury or death as well as destruction of equipment and plant facilities. Where there is possibility of splash or other direct exposure, personnel working with molten aluminum must wear eye and face protection as well as protective clothing.

The Aluminum Association releases an annual molten metal incident report to report information regarding hazardous events that occur at facilities melting aluminum

- See more at: http://www.aluminum.org/resources/electrical-faqs-and-handbooks/safety#sthash.nYQ3g86X.dpuf

On 14/06/2017 19:53, Robert Beck wrote:

> Dear Mr. Corbyn,
>
> Aluminium has many uses in buildings now. I know that aluminium in powdered form is a fire accelerant. Whether it is in molten form needs to be investigated.
>
> I think that both the cladding and insulation used in the refurbishment of Grenfell Tower are likely to have included aluminium. It may have been used in electrical insulation and shielding internally also.
>
> Robert F. Beck
> Physicist and former town planner

Appendix 2

Copies of emails and letters sent in following days

Subject: Grenfell Tower Fire
Date: Sat, 17 Jun 2017 11:58:20 +0100
From: Robert Beck <robert.beck@ntlworld.com>
To: corbynj@parliament.uk

Dear Mr. Corbyn

I do not know why you are not acting on the information I provided re molten aluminium exploding.

I have sent copies of the emails I sent on 14th June to many other people now.

You have been doing so well in the public eyes that I hope you do not blow it!

Subject: Molten aluminium is explosive!
Date: Mon, 19 Jun 2017 12:26:59 +0100
From: Robert Beck <robert.beck@ntlworld.com>
To: news@sky.com, bbcnewschannel@bbc.co.uk, charlie.stayt@bbc.co.uk

But this fact is ignored! No replies or action on the following:

To avoid repetition, what followed is emails in Appendix 1

Subject: Molten aluminium is explosive!
Date: Mon, 19 Jun 2017 12:27:09 +0100
From: Robert Beck <robert.beck@ntlworld.com>
To: victoria@bbc.co.uk

But this fact is ignored! No replies or action on the following:

To avoid repetition, what followed is emails in Appendix 1

Subject: Molten aluminium is explosive
Date: Mon, 19 Jun 2017 12:27:22 +0100
From: Robert Beck <robert.beck@ntlworld.com>
james.cleverly@london.gov.uk, navin.shah@london.gov.uk, john.biggs@london.gov.uk, steve.o'connell@london.gov.uk, richard.barnes@london.gov.uk, joanne.mccartney@london.gov.uk, len.duvall@london.gov.uk, roger.evans@london.gov.uk, valerie.shawcross@london.gov.uk, richard.tracey@london.gov.uk, jennette.arnold@london.gov.uk, tony.arbour@london.gov.uk,
To: kit.malthouse@london.gov.uk, gareth.bacon@london.gov.uk, richard.barnbrook@london.gov.uk, andrew.boff@london.gov.uk, victoria.borwick@london.gov.uk, Dee Doocey <Dee.Doocey@london.gov.uk>, nicky.gavron@london.gov.uk, darren.johnson@london.gov.uk, mark.morris@london.gov.uk, caroline.pidgeon@london.gov.uk, Richard@richardbarnes.co.uk <Richard@richardbarnes.co.uk>

See over for text of message

But this fact is ignored! No replies or action on the following:

To avoid repetition, what followed is emails in Appendix 1

Subject: Reasons why Grenfell Tower fire spread so quickly
Date: Thu, 22 Jun 2017 07:35:53 +0100
From: Robert Beck <robert.beck@ntlworld.com>
To: Jeni Jackson <Jeni.Jackson@woking.gov.uk>
CC: PlanningCommittee@woking.gov.uk, Sharon Galliford <sharongalliford@hotmail.com>

Dear Jeni,

I have just just provided Douglas Spinks with two paper copies of the attached (one for Building control), which contains vital information to help explain the terrible events at Grenfell Tower.

This has great implications regarding how it is decided if materials are acceptable, because they may comply with current Building Regulations but still be extremely dangerous.

Thus I think it vital that Development Control is aware of this new information.

I have known for over 50 years that aluminium in finely divided form is a fire acellerant. Thus the speed at which the Grenfell Tower fire spread made me suspect that it may be in molten form also.

I took me just a few minutes on-line to discover that molten aluminium is explosive, and thus a great fire hazzard, in the presence of moisture or other contaminants.

Thanks to The Times, who provided details of the materials and construction used in the external refurbishment at Grenfell Tower, I have been able to suggest a hypothesis explaining how and why the fire spread so quickly.

This means that a combination of materials and design contributed to the problem, but that aluminium was the key to such rapid spread.

My good friend, Sharon Galliford, who stood as Green Party candidate against Michael Gove at Surrey Heath, has just drawn this to the attention of the new Environment Secretary.

What I have learned since producing the attached is that the burning insulation produces the extremely poisonous hydrogen cyanide. This is also combustible and, in the right proportions with air, explosive. The products of combustion are carbon dioxide and nitrogen, both of which support the burning of aluminium.

Best regards

Robert F. Beck

Attachment was Appendix 3

Subject: Fwd: Fwd: Fwd: Re: Grenfell Tower
Date: Thu, 22 Jun 2017 07:36:19 +0100
From: Robert Beck <robert.beck@ntlworld.com>
To: information.services@rbkc.gov.uk

FAO Councillor Judith Blakeman

See emails below and attached pdf

What I have learned since producing the attached is that the burning insulation produces the extremely poisonous hydrogen cyanide. This is also combustible and, in the right proportions with air, explosive. The products of combustion are carbon dioxide and nitrogen, both of which support the burning of aluminium.

To avoid repetition, what followed is emails in Appendix 1
Attachment was Appendix 3

Subject: Re: Grenfell Tower
Date: Thu, 22 Jun 2017 07:36:32 +0100
From: Robert Beck <robert.beck@ntlworld.com>
To: SUZANNE.DAY@london-fire.gov.uk

Thank you Suzanne. Your Fire Safety department should find the attached diagramatic representation of what I think happened helpful.

What I have learned since producing the attached is that the burning insulation produces hydrogen cyanide. This is also combustible and, in the right proportions with air, explosive. The products of combustion are carbon dioxide and nitrogen, both of which support the burning of aluminium.

On 19/06/2017 16:03, SUZANNE.DAY@london-fire.gov.uk wrote:

> Dear Sir
>
> Thank you for your recent e mail concerning the fire at Grenfell Tower Block. As you might imagine we have received, and are continuing to receive, many e mails regarding this incident from a variety of sources. We are of course conducting an investigation into the fire at Grenfell Tower and your comments have been forwarded to our Fire Safety department as part of that process.
>
> Yours faithfully
>
> **Suzanne Day**
>
> Operation Directorate Support Services
>
> London Fire Brigade
>
> 169 Union Street London SE1 0LL
>
> **T** 020 8555 1200 x 30804
>
> **E** suzanne.day@london-fire.gov.uk

Subject: Re: Molten aluminium is explosive!
Date: Thu, 22 Jun 2017 20:26:10 +0100
From: Robert Beck <robert.beck@ntlworld.com>
To: news@sky.com, bbcnewschannel@bbc.co.uk, charlie.stayt@bbc.co.uk, victoria@bbc.co.uk, information.services@rbkc.gov.uk, news@channel4.com, mayor@london.gov.uk, corbynj@parliament.uk, Letters@independent.co.uk <Letters@independent.co.uk>

There is clearly a cover up about the dangers of aluminium.

I know that aluminium has become important in many aspects of modern life and thus the economy, but how can anyone risk a repeat of the terrible horrors of Grenfell Tower?

I have produced the attached to help those happy to go along with this, to see that aluminium is clearly part of the process by which the fire spread so rapidly.

Understanding this process is vital in realising that aluminium need not be demonised because of this.

Professor Christopher Exley of Keele University calls this the 'Aluminium Age', and knows of great biochemical issues with it, whereas I understand the physical better than most. It is a unique material that needs to be understood very thoroughly to make the most of it without putting life on this planet in danger.

Covering up any danger is just plain stupid, and evil if it is allowed to continue.

Attachment was Appendix 3 and in the following email also

Subject: Re: Molten aluminium is explosive!
Date: Fri, 23 Jun 2017 08:11:59 +0100
From: Robert Beck <robert.beck@ntlworld.com>
To: news@sky.com, bbcnewschannel@bbc.co.uk, charlie.stayt@bbc.co.uk, victoria@bbc.co.uk, information.services@rbkc.gov.uk, news@channel4.com, mayor@london.gov.uk, corbynj@parliament.uk, Letters@independent.co.uk <Letters@independent.co.uk>

The reason why the problems with aluminium make composite panels conflict with the Building Regulations was made clear by fire safety expert, Arnold Tarling on Breakfast TV this morning.

According to Mr. Tarling, the Building Regulations state that the flammability of the core can be ignored if it is encased with non- flammable material.

The assumption that aluminium is adequate in this respect ignores instances where the aluminium may melt, and much worse than that, then become an explosive fire acellerant.

The attached provides a plausible set of circumstances of particular construction and materials in which the inner aluminium sheet can melt. The Grenfell fire demonstrated that the aluminium did melt.

Thus the panels used there did not comply with the Building Regulations.

This might be solved by using stainless steel instead of aluminium, by ensuring that the insulation between the panels and the building is completely non-flamable, or by moving the location of the air gap, or some combination of these, maybe using aluminium instead of stainless steel externally to reduce costs and problems of reflectivity, but ruling out aluminium may be the only entirely safe option.

And, of course, insulation that does not produce hydrogen cyanide is absolutely essential.

Subject: Fwd: Re: Molten aluminium is explosive!
Date: Fri, 23 Jun 2017 08:43:59 +0100
From: Robert Beck <robert.beck@ntlworld.com>
To: David Stevens <David.Stevens@woking.gov.uk>, David.Edwards@woking.gov.uk, Douglas Spinks <Douglas.Spinks@woking.gov.uk>, PlanningCommittee@woking.gov.uk, Woking News and Mail <editor@wokingnewsandmail.org>

Important clarification re Building Regulations

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To: news@sky.com, bbcnewschannel@bbc.co.uk, charlie.stayt@bbc.co.uk, victoria@bbc.co.uk, information.services@rbkc.gov.uk, news@channel4.com, mayor@london.gov.uk, corbynj@parliament.uk, Letters@independent.co.uk <Letters@independent.co.uk>

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Subject: Fwd: Fwd: Re: Molten aluminium is explosive!
Date: Fri, 23 Jun 2017 14:51:47 +0100
From: Robert Beck <robert.beck@ntlworld.com>
To: Jonathan Lord <jonathan@wokingconservatives.org.uk>, Woking News and Mail <editor@wokingnewsandmail.org>, Sharon Galliford <sharongalliford@hotmail.com>

Dear Mr. Lord,

As you can see from all below, by the evening after the Grenfell Tower fire, I had identified problems with the cladding relating to the aluminium rather than just the flammability of the core.

Lack of replies other than standard acknowledgements, or any revelation or discussion of this in the press and media, suggest that molten aluminium being explosive is an inconvenient truth.

I hope that you will be vigilant regarding the possibility that Woking Borough Council might also consider this to be an inconvenient truth.

Note that I have just explained to them the relevance of aluminium melting to the Building Regulations.

My good friend, Sharon Galliford, who stood as Green Party candidate against Michael Gove in Surrey Heath has advised him as new Environment Secretary of these problems with aluminium.

Will you ask a question in the House to seek confirmation that Mr. Gove will not allow such problems to escape the scrutiny of the public inquiry and will take appropriate action to keep the public safe in the meantime?

Robert F. Beck

-------- Forwarded Message --------
Subject: Fwd: Re: Molten aluminium is explosive!
Date: Fri, 23 Jun 2017 08:43:59 +0100
From: Robert Beck <robert.beck@ntlworld.com>
To: David Stevens <David.Stevens@woking.gov.uk>, David.Edwards@woking.gov.uk, Douglas Spinks <Douglas.Spinks@woking.gov.uk>, PlanningCommittee@woking.gov.uk, Woking News and Mail <editor@wokingnewsandmail.org>

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> On 19/06/2017 12:26, Robert Beck wrote (on the subject: Molten aluminium is explosive):
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> >
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I think that both the cladding and insulation used in the refurbishment of Grenfell Tower are likely to have included aluminium. It may have been used in electrical insulation and shielding internally also.

Robert F. Beck

Physicist and former town planner

Sorry for repetition, which is to make it very clear what the MP for Woking received

-------- Forwarded Message --------
Subject: Woking Tower Blocks
Date: Sat, 24 Jun 2017 15:47:03 +0100
From: Robert Beck <robert.beck@ntlworld.com>
To: Woking Informer <wokinginformer@trinitysouth.co.uk>

Dear Editor,

I am an independent theoretical physicist and former senior planning oficer at Woking Borough Council.

I have discovered something that everyone else seem to have missed regarding the Grenfell Tower fire, that could have serious implications for tower blocks in Woking.

It isn't just the flamability of the core material in the aluminium panels that is important, because molten aluminium is explosive in the presence of moisture or other contaminants.

I checked this because I have known for a very long time that aluminium in finely divided form burns and is a fire acellerant used in high explosives. I learned more recently that it is now added to jet engine fuel to make it burn hotter, and that powdered aluminium burns in the presence of carbon dioxide, carbon monoxide, or even nitrogen. I have to suspect that this applies when molten aluminium explodes, because freshly exposed, greater surface areas will react very quickly.

I have advised the Fire Safety Officer at Woking Fire Station, and various people at Woking Borough Council, of this, but the huge financial implications regarding the Victoria Square scheme, and the lack of recognition elsewhere is something that should alert us to the need for vigilance regarding what cladding materials are used, and the rigour of testing existing buildings.

From the artist's impression of the Victoria Square scheme, it does look to me that aluminium cladding is proposed in the very tall blocks and the hotel. Fire appliances at Grenfell Tower could not reach the upper floors. Could they at Victoria Square?

Aluminium can also be used in the interiors of modern buildings, in electrical and other insulation and shielding of electronic equipment, for instance. If it melts it is likely to explode, especially if water is used to try to control the fire (including in sprinklers!), and then even CO2 fire extinguishers may not stop it burning!

Robert F. Beck
St. Johns, Woking

Subject: Re: Letter to the editor
Date: Tue, 27 Jun 2017 11:08:52 +0100
From: Robert Beck <robert.beck@ntlworld.com>
To: Editor <editor@wokingnewsandmail.org>

Thanks Rob,

I can't imagine this or other fire safety problems with tall buildings happening when I was a town planner, and another retired town planner just said this on TV also.

We need to go back to publicly employed Building Control Officers instead of allowing independent ones in an attempt to reduce public expenditure. Currently, financial considerations can all to easily outweigh safety issues, and follow up enforcement can fail also.

But the problem with aluminium panels and building regulations gets complicated apart from this. Sheet aluminium is actually fire retardent at temperatures not hot enough to melt it. Thus in standard testing it can appear safe. At Grenfell Tower it was the combination of materials and design that in my opinion caused the alluminium to melt. It is only in such circumstances that the aluminium cladding fails the requirements of the building regulations. Interviews with fire safety experts on Victoria Derbyshire just now agree with me that the testing has been inadequate prior to the Grenfell tower fire, and that the building regulations need clarifying on this issue.

It is, however, my opinion that architects, surveyors and public officials have been grossly negligent in not adequately researching what took me about five minutes to discover regarding the dangers of molten aluminium.

But the fact that my 1961 Encyclopaedia Britannica has a lot about aluminium burning, begs the question of how government scientists could not know about this? The answer is that aluminium has become too economically important, for instance in aeroplanes, for this to be allowed to become known to the public.

On 27/06/2017 09:30, Editor wrote:

> Hello Mr Beck
>
> Thank you for your letter to the editor, below. This week's letters page has gone to the printers but we will certainly use your contribution next week.
>
> Also, just to let you know that I am writing a follow-up story for this week, based on the new information in your recent e-mails to me.
>
> It is beyond my comprehension that any sort of flammable panels were ever permitted to be used on tower blocks, or any sort of housing.
>
> Regards
>
> **Rob Searle**
>
> **Senior Reporter and Sub Editor**
>
> **01483 375793 07913 416435**

See following pages for letters

Robert F. Beck
17 LARCHWOOD ROAD ST.JOHNS WOKING SURREY GU21 8XB
PHONE 01483 829685 email : robert.beck@ntlworld.com
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Editor
The Times
1 London Bridge Street
London SE1 9GF

16th June 2017

Grenfell Tower fire

I am an independent theoretical physicist and retired town planner.

By the evening of the 14th June I had a good idea of why the fire spread so quickly. See attached emails to Jeremy Corbyn, Channel 4 News, the London Fire Brigade and the Mayor.

As soon as I knew that the cladding used in the refurbishment included aluminium, I had serious suspicions that this played a significant role in how fast the fire spread, based on something I learned over fifty (50) years ago! Aluminium has long been used in the high explosive, amonal, because it is a fire accelerant. I know now that it is currently also added to jet engine fuel. Even my 1961 Encyclopaedia Britannica has much to say about the burning of aluminium, including that it will burn in the presence of only carbon dioxide, carbon monoxide, and nitrogen.

It took me well under ten minutes on the internet to confirm the danger of aluminium in fires in molten as well as finely divided form!

So how come that architects seem not to know?

How come that building control seem not to know?

How come the fire brigade seem not to know?

Why did nobody speculating on why the fire spread so quickly get experts on the dangers of aluminium to comment, or at least do an internet search?

As usual, convenience and finance are way more important than people.

Note that the Conservatives put water privatisation before the people of Camelford when a huge amount of aluminium sulphate was accidentally added to local water supplies.

Aluminium has become an important part of modern economy. Professor Christopher Exley of Keele University calls this the 'Aluminium Age', and knows of great biochemical issues with it, whereas I understand the physical well enough to know that it has unusual properties.

I now know that molten aluminium in the presence of moisture can explode, spreading the fire, and I suspect that it then acts as a fire acellerant in a similar way to powdered aluminium, which is to do with aluminium's affinity with oxygen. This urgently needs testing on the undamaged panels.

Yours sincerely,

Robert F. Beck

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The Editor
Independent House,
191 Marsh Wall,
London
E14 9RS.

17th June 2017

Grenfell Tower fire

I am an independent theoretical physicist and retired town planner.

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It took me well under ten minutes on the internet to confirm the danger of aluminium in fires in molten as well as finely divided form, to which the above applies!

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Yours sincerely,

Robert F. Beck

Please note that my internet is currently down

Enc. emails to Jeremy Corbyn, Channel 4 News, the London Fire Brigade and the Mayor.

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Douglas J. Spinks
Deputy Chief Executive
Woking Borough Council

17th June 2017

Grenfell Tower fire

As you can see from the attached, the use of aluminium at all, not just in inferior panels, in high rise buildings, should not be permitted.

This should not wait for a public inquiry results, nor for a change in the Building Regulations.

Molten aluminium is explosive in the presence of moisture or contaminants.

I hope you will act with wisdom and not expedience.

Yours sincerely

Robert F. Beck

cc Woking News & Mail

Attachment was Appendix 1

Robert F. Beck
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Fire Safety Officer
Woking Fire Station
Goldsworth Road
Woking

20th June 2017

Dear Sir,

Fire safety in Woking Tower blocks

I am an independent theoretical physicist and former Senior Planning Officer at Woking Borough Council.

I have long known that aluminium in finely divided form is a fire acellerant. The Grenfell Tower incident led me to suspect that it can be in molten form also. On the evening of 14th June 2017, some internet research confirmed this via the discovery that molten aluminium can explode in the presence of moisture or other contaminants.

Thanks to The Times, who provided details of the materials and construction used in the external

refurbishment at Grenfell Tower, I have been able to suggest a hypothesis explaining how and why the fire spread so quickly.

I hope that you will find the attached useful in analysing potential dangers in existing and future high rise buildings in Woking.

I have already advised my former colleague at the Town Hall, Douglas Spinks, of my discovery that molten aluminium is explosive and will be sending him a copy of the attached.

Yours faithfully,

Robert F. Beck

Attachment was Appendix 3

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Douglas J. Spinks
Deputy Chief Executive
Woking Borough Council

20th June 2017

Dear Douglas,

Grenfell Tower fire

Further to my letter of 17th June, I have enclosed copies for yourself and Building Control explaining the mechanism that I think accounted for the exceptionally fast spread of the fire at Grenfell Tower.

I based this on information provided by The Times regarding the materials and construction used in the external refurbishment, and my own knowledge and research.

Yours sincerely

Robert F. Beck

Two copies of Appendix 3 were enclosed

Robert F. Beck
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The Rt. Hon. Sajid Javid MP
Communities Secretary
House of Commons
London
SW1A 0AA

24th June 2017

Dear Mr. Javid

Grenfell Tower fire – vital evidence

I am an independent theoretical physicist and retired town planner.

By the evening of the 14th June I had a good idea of why the fire spread so quickly. See attached emails to Jeremy Corbyn, Channel 4 News, the London Fire Brigade and the Mayor, at the end of the attached other emails developing this realization and apparent reluctance for it to be publicised.

As soon as I knew that the cladding used in the refurbishment included aluminium, I had serious suspicions that this played a significant role in how fast the fire spread, based on something I learned over fifty (50) years ago! Aluminium has long been used in the high explosive, amonal, because it is a fire accelerant. I know now that it is currently also added to jet engine fuel. Even my 1961 Encyclopaedia Britannica has much to say about the burning of aluminium, including that it will burn in the presence of only carbon dioxide or carbon monoxide or nitrogen.

It took me well under ten minutes on the internet to confirm the danger of aluminium in fires in molten as well as finely divided form, to which the above applies.

So how come that architects seem not to know?

How come that building control seem not to know?

How come the fire brigade seem not to know?

These are questions for the public inquiry to consider, but the following may be relevant.

Aluminium has become an important part of modern economy. Professor Christopher Exley of Keele University calls this the 'Aluminium Age', and knows of great biochemical issues with it, whereas I understand the physical well enough to know that it has unusual properties. Between us the great usefulness but also great potential dangers can be understood.

So the crime here has become quite complicated, but I would say that the government's scientific advisers have to know most that I know, and possibly all that I know. The decision not to make aluminium's dangerous properties known to those who need to know for public safety is almost certainly badly influenced by economic and undemocratic factors. This is a crime against humanity and contrary to the views you expressed on BBC Breakfast TV this morning – human life must come first.

That said, I think it criminally negligent that architects and building control officers seem to not adequately research the easily discovered properties of materials they use or allow to be used.

Yours sincerely,

Robert F. Beck

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Councillor Will Forster
Deputy Mayor
Woking Borough Council

26th June 2017

Dear Councillor Forster,

Tower blocks in Woking

Your concerns and mine appear together on page 3 of 22 June 2017 Woking News & Mail.

The enclosed emails and letters demonstrate that I have not been accurately reported.

Ten minutes after I said that aluminium in molten form needed to be investigated, I had done the research and followed my initial email (to more recipients than Woking News & Mail reported) with my findings that molten aluminium is explosive in the presence of moisture or other contaminants. I was quoting from a very authoritative source to which I provided a link.

If aluminium melts, as it clearly did in the Grenfell Tower fire, the panels cannot comply with the Building Regulations.

I did not say that I had serious concerns 50 years ago. I said that something I learnt over 50 years ago made me suspect, on hearing on the evening following the fire that aluminium was used in the panels, that this played a part in the incredibly fast spread of the fire. This was that aluminium in finely divided form is used in high explosives.

Any freshly cut surface of aluminium rapidly oxidises because it has a very high affinity for oxygen, this normally makes it fire retardant. Thus if aluminium melts, and especially if it explodes, there is a new propensity to burn via newly exposed surfaces. So high is this that in finely divided form it will burn in only the oxygen contained in carbon dioxide or carbon monoxide.

Note that I wrote to Douglas Spinks, copied to Woking News & Mail, on 17 June 2017. The latter clearly quoted from the first and second sentences, but not the very next, and incredibly important line:

> "Molten aluminium is explosive in the presence of moisture or other contaminants"

When did, according to the Woking News & Mail, Woking Borough Council reassure tenants of its homes that they comply with the latest fire safety laws? I hope that this was before my letter of 17 June 2017.

I have to say that the lack of replies or any action or publicity about molten aluminium being explosive, leads me to suspect that this is an inconvenient truth to anyone putting financial considerations before public safety. Governments have many reasons. There is clearly a huge temptation in Woking in the form of the Victoria Square development. But the information I have provided to Douglas Spinks, Building Control, and Woking Fire Safety Officer, may lead to fruitful discussions about materials and design details that will permit its reasonably safe completion.

Though just as the height and location gave me cause for concern about wind, they do about fire safety.

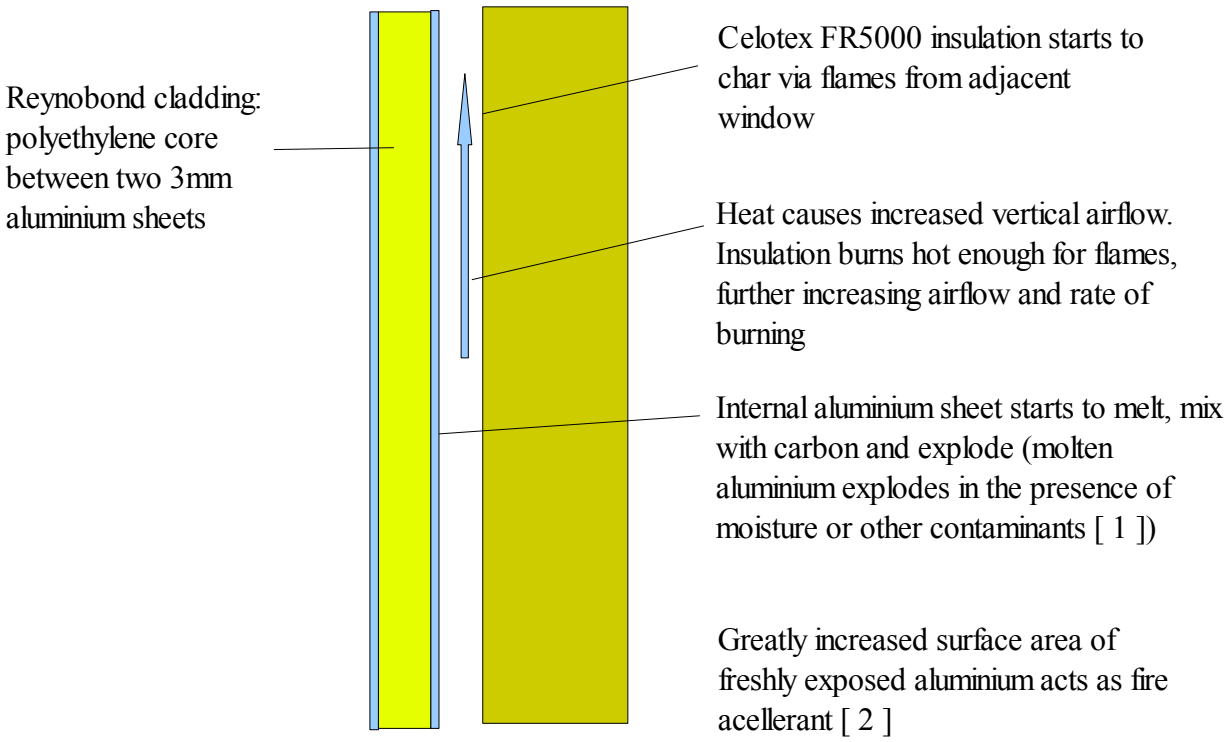
Yours sincerely

Robert F. Beck

Appendix 3

Grenfell Tower Fire 14 June 2017

The Beck Hypothesis



Process becomes self-reinforcing and rapidly accelerating as more aluminium melts, polyethylene core burns and outer aluminium sheet also melts and explodes, exacerbated by spraying of water

Exploding aluminium further spreads both the extent of the fire and fire acellerant

Note: Aluminium in finely divided state burns in the presence of carbon monoxide or carbon dioxide [2] It forms part of the high explosive, amonal, and is added to jet engine fuel to make it burn hotter.

[1] http://www.aluminum.org/resources/electrical-faqs-and-handbooks/safety

[2] Encyclopaedia Britannica 1961, p. 715

Robert F. Beck is an independent theoretical physicist whose first career was in town planning after studying mechanical engineering at degree level for two years after getting the second year prize for physics when doing A levels at Brooklands College, where he undertook a private study of relativity. He returned to physics following a second career as repairer and restorer. His talent for understanding mechanisms helped in this second career and in working out solutions in particle physics via his new interpretation of Einstein's relativity.