ARTICLE: SO CALLED CLADDING; A REGULATORY MINEFIELD

By John Rakic

Introduction

Building Regulations historically have changed following public disdain for multiple fatality tragedies and typically in the wake of these tragedies, it is only then that we have seen Governments respond quickly and make changes to appease public unrest, and dare I say keep the voters on side. Sadly, any other necessary changes to keep pace with the changing methods and materials used in construction, take way too long and the process here in Australia is very convoluted and frustratingly slow and too bureaucratic. The Regulatory change process and I would argue is failing Australians; this is just a fact and I wonder what it would take to change the status quo to avoid knee jerk regulatory reforms and possibly avoid more multiple fatality tragedies.

This article will discuss the Building Control Legislative change process, review some changes following tragic Australian fires, and discuss what is now being referred to as the Cladding Pandemic we face in Australia.

Having spent almost an entire career in the Building industry and tracking Regulatory change and associated technical standardisation to support the Regulations, I feel well versed to critically comment and recommend a mechanism to talk less and just fix the damn problems!!!!

The Building Control Regulatory System

Building Control is not included in our Commonwealth of Australia Constitution Act, so in simple terms, Regulatory Control falls with the individual States & Territory Governments of Australia.

This is a mouthful, and what does it mean to construction or building in Australia?

It means, we see inconsistencies in both the Building Control Legislation and Technical provisions or rules for how we build in different parts of the country.

Are some people, less important than others, or are fires more severe in some part of the country? The answers to these questions are obviously a big “no”. The overall State & Territory Legislative based process around Building Control results in this anomaly sadly.

I started in the so-called Building Industry in the early 1990’s, which was not long after the work of AUBRCC lead to our first model Building Code of Australia, BCA1990.

This AUBRCC work started in 1965, then it took 25 long years for a National Technical Document for construction of buildings in Australia, and then the 8 States & Territory Governments all subsequently called up the BCA 1990 as it was in their local Building Control Legislation.

1994, saw the formation of the ABCB, who are charged on behalf of the States & Territories to further develop and administer what was the BCA, and now it is aptly called the National Construction Code, or NCC for short.

Any changes to the NCC, are very painful and have to undergo a rigorous cost-benefit analysis and speaking candidly, I don’t envy the job of ABCB. Sadly however, the NCC has many old legacy issues or old antiquated provisions which just seem to stay in NCC and ultimately cause industry confusion, create convenient “loop holes” and potentially expose the community to undue risk in the advent of fires. Ironically, it takes a death or several deaths to invoke prompt change to clauses which if the system could somehow be more flexible and less bureaucratic, many of these clauses would have been amended long before now.

The development of Australian Standards is also slow and beauracratic and sadly often suffers from key stakeholders with vested interests in the drafting of the Standards dominating proceedings.

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Historical fires and Regulatory changes

Before I discuss these fires, I would like to take a moment to respect those poor soles who lost their lives and pay homage to our brave fire service personnel who risk their lives daily fighting fires.

Salvation Army Fire

Salvation Army (William Booth Memorial Home for Men) at 462 Little Lonsdale Street), Melbourne in 1966.

"The fire started in one of the rooms on the third floor. In the end 30 men were dead."

This fire occurred in the year I was born, in my City of birth so it would be remiss of me to ignore this fire.

I am unsure of what regulatory changes may have occurred. It was well before our first National Building Code of Australia in 1990.

Kew Cottages Fire

In April 1996 nine men were killed in a fire that swiftly and violently engulfed their unit at Kew Cottages, a residential institution for people with intellectual disability.

The outcry from the fire saw sprinklers mandated in residential aged care facilities in Victoria.

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Childers Palace backpackers fire

23 June 2000 - 15 people were killed

It really feels like yesterday when this QLD fire occurred.

Regulators in QLD had to be seen to do something as tourism was immediately at risk; overseas youth visiting sunny QLD being killed; this can't happen……

There were prompt and serious fire safety reforms around smoke alarms, maintenance of fire protection equipment and the introduction of licensing for fire practitioners in QLD quickly implemented.

Well done to QLD Government, but why didn't other States and Territories implement the same Regulatory reforms? Madness!

Black Saturday bushfires

The fires occurred during extreme bushfire weather conditions and resulted in Australia's highest-ever loss of human life from a bushfire, with 173 fatalities. Many people were left homeless as a result.

A Royal Commission enquiry saw some rigour around finalisation of revision of AS3959, Construction in bushfire prone areas and implementation of new fire test methods and Bushfire Attack or BAL ratings for elements of construction.

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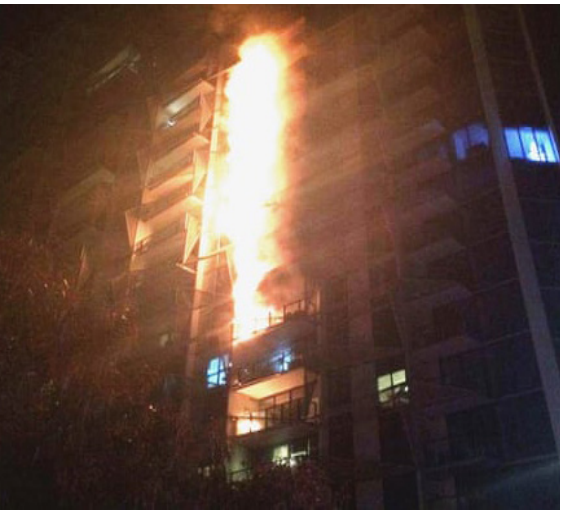
Cladding Fires in Australia

Grenfell Tower

14 September 2017; claiming a total of 72 lives

It is hard to talk about cladding and fires and not mention Grenfell and the tragic fire and terrible fatality toll.

One cannot help but think the huge global media frenzy following this fire swayed regulators globally to revisit their local regulations and fire test methods for cladding on high rise buildings.



Lacrosse Towers, Docklands, Melbourne

Thank goodness no one was seriously injured or lost their lives in this fire.

In the early morning of 24 November 2014, a fire broke out on the balcony of Apartment 805 in the Lacrosse apartment tower in Melbourne Docklands. Starting from an unextinguished cigarette butt, the fire proceeded to climb up 13 storeys on the face of the building in just 11 minutes before firefighters brought it under control.

This fire has been well publicised in Australia, and preceded Grenfell by nearly 3 years. The damages lead to the root causes being tried in court and resulted in serious penalties for the fire safety engineering consultancy and the private certifiers or building surveyors for this development.

Neo 2000, Melbourne

May 3, 2019

Thank goodness again that no one was seriously injured or lost their lives in this fire.

On a balcony crowded with furniture, books and flattened cardboard boxes, a lit cigarette had been smouldering near some clothing, possibly for hours.

Then, with astonishing speed, a blaze began.

Regulatory response to date around so called "cladding"

Whether it was Lacrosse, or Grenfell, or a combination of both, Regulators realised that poor documentation and convenient loopholes existing in the NCC.

Somehow, as much as 4 million sqm of decorative cladding on our buildings, utilised an Aluminium Composite Panel (APC) consisting of a total PE core; I will call this material ACP-PE. Some of the building stock used APC-FR material and quite a lot of the buildings used an Aluminium bonded honeycomb core product, often referred to as G2, which I think might be a proprietary material designation.

This APC-PE material type was used on the Lacrosse Towers projects in Docklands, and the MFB fire services reported that they had never experienced a fire with such rapid fire spread. It spread up 13 storeys in as little as 11 minutes and it was reported that had the prevailing winds not been as they were, it could have been a much worse fire.

It is not for this article, but how did so much ACP-PE get sold and used on some many buildings?

There are some Aluminium Composite Panel products available on the market with less than 30 per cent of PE, mixed with an inert mineral filler; I will call this material APC-FR.

Full scale comparison fire test show that the APC-FR materials create far less vertical flame spread that the APC-PE materials.

I am not sure of the exact timing, and it probably is of little consequence in terms of the outcomes, but the NCC was changed to close the loopholes and to ensure that APC-PE could no longer be used. These changes really are interim in nature and suggest that only so called "non-combustible" materials can used, and sadly the fire testing pathway for these is an old, antiquated, quick and cheap, small scale fire test, AS 1530.1.

At State & Territory Government level, new regulations were enacted, to deal with the existing building stock that was now identified as potentially at high risk.

The so called "recladding" pandemic was suddenly borne and the media has had a field day here as building owners are being asked to reclad their buildings, which is an expensive and terrible predicament they sadly find themselves in.

State & Territory Governments all started mechanisms to audit their Building Stock and assess and prioritise the risks pertaining to the cladding on each building.

We do know that there are different types of core materials used in ACPs as discussed briefly above.

Aluminium Composite Panel generic types

APC-PE – total PE core

APC-FR – loosely defined as Maximum 70 per cent PE core and at least 30 per cent inert mineral core

G2 – Bonded Aluminium honeycomb core

APC-NC – new proprietary material with total non combustible mineral core

.....

Solid Aluminium – I include this here for completeness but it is not a composite; hence the use of "solid" by suppliers of these materials to differentiate it from ACP's

Banning of ACP's & replacement or so-called recladding of ACP-PE materials

Unfortunately, Aluminium Composite Panels are a taboo word now.

There has been a hive of regulatory activity around "cladding" post Grenfell which I think was a serious trigger for Governments. Audits of building stock have been mandated, rectification orders implemented, Government support packages, and all sorts of related activities; and most importantly Non-Compliant Building Products (NCBP) Legislation has been enacted.

From the good old internet, some National and State & Territory recladding dates of implementation are as follows:

National

Talks of banning imports:

Centre Alliance SA Senator Rex Patrick has announced plans to reintroduce a bill to ban the entry of flammable cladding materials into the country when Parliament resumes.

The Customs Amendment (Safer Cladding) Bill 2017 was introduced by former senator Nick Xenophon after a Senate Economics Committee Inquiry into non-conforming building products was completed.

But the bill was opposed by Coalition senators and lapsed at the May general election.

"I'm re-introducing Nick Xenophon's cladding bill into the Parliament when we go back," he announced yesterday on his Facebook page. "The bill, if passed into law, would prevent the importation of cladding products containing flammable polyethylene core aluminium composite panels."

"Despite some Liberals expressing concerns about a ban breaching World Trade Organisation rules or harming the signage industry, I am putting people's lives well ahead of those issues."

The insurance industry has long pushed for a consistent rectification strategy to deal with buildings with flammable cladding materials. The ongoing cladding crisis is a major trigger behind the sharp rise in premiums and the introduction of restrictive policies.

NSW

An "ACP" ban took effect on 15 August 2018.

The NSW Cladding Taskforce was established to identify buildings with potentially combustible cladding and support local councils to address the use of non-compliant cladding materials.

The Taskforce audited 185,000 building records and to date 4127 buildings have been inspected.

Not all cladding is dangerous. There are a number of factors which are considered when determining whether cladding on a building may pose a higher risk including the total coverage, vertical coverage, positioning around balconies, windows or doors, as well as the types of building and the way it is used.

VIC

Since the establishment of a State-wide Cladding Audit in November of 2017, The Victorian Building Authority (VBA), in cooperation with the Victorian State Government, have conducted inspections across over 2,500 buildings, delivering over 1,300 building assessments in the same period.

This undertaking has also identified, as documented across local and national media, industry publications and governing bodies, "multiple failures – in buildings, in regulation and in industry."

Since that time, several amendments, updates and revisions have been made across state legislation (notably through the National Construction Code and ministerial orders), which aim to clarify conditions surrounding acceptable use of cladding, performance solutions, avenues to rectification and liability.

To date, more than 400 buildings of the 2500 plus inspected have been categorised as "high risk", an additional 72 further classified as "extreme risk".

The Andrews Government has also committed to a $600m cladding rectification fund in a bid to alleviate the impact of rectification works and corrective measures on owners and occupants.

Banning of ACP's & replacement or so-called recladding of ACP-PE materials

QLD

An estimated 12,000 Queensland buildings are captured by new cladding laws which require building owners to report to the QBCC about the material on the exterior of their building.

The Building and Other Legislation (Cladding) Amendment Regulation (2018) came into effect on 1 October 2018 meaning that, by law, some building owners must complete the online Safer Buildings combustible cladding checklist to assess their building's safety.

WA

The Building Commissioner announced on 4 July 2017 that, in response to the Grenfell Tower fire, the WA Building Commission (now the Building and Energy division of DMIRS) would broaden the scope of an initial audit it had been carrying out on aluminium composite panels (ACPs) into a state-wide cladding audit that would include all high-risk, high-rise buildings with cladding attached.

SA

The Attorney-General's Department (AGD) is coordinating a building audit in response to recent concerns regarding the use of Aluminium Composite Panels (ACP) on buildings.

ACP is frequently used for external cladding or facades, insulation and signage along with internal applications.

30 buildings have a risk rating of High or above. Owners' actions to address the audit findings and recommendations will be monitored on a regular basis.

ACT

A summary of the response of the Australian Capital Territory government is as follows:

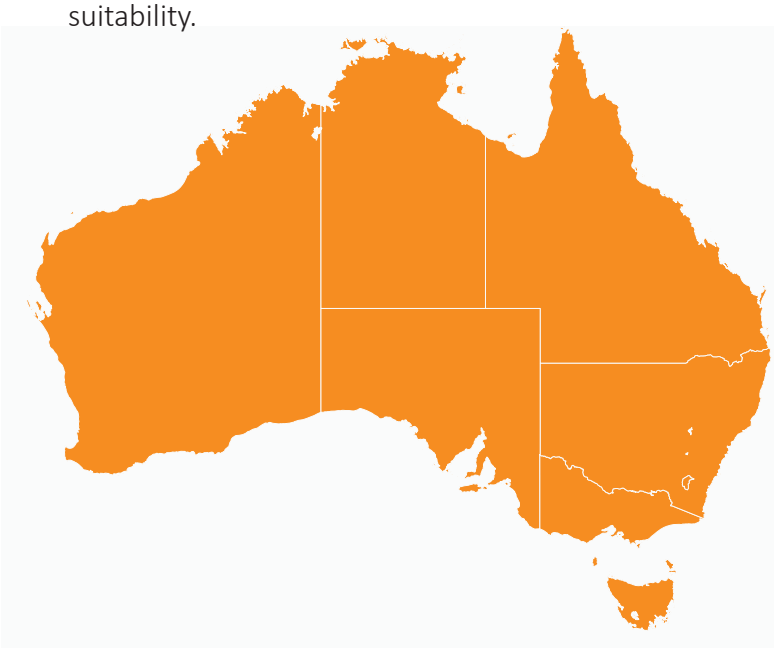
- in July 2017, the ACT government announced the establishment of a taskforce to coordinate work to identify and address buildings that are at a high risk from combustible cladding;
- the taskforce included representatives from the Environment, Planning and Sustainable Development Directorate, the Emergency Services Agency and Access Canberra;

TAS

Amendments to the Building Regulations 2016 (Tas) came into effect on 27 December 2017.

The amendments provided the following:

- classifying ACPs containing a PE core as a high risk building product when it is used on buildings of 2 storeys or more;
- empowering the Director of Building Control to determine if the use of the product is classified as high risk and to determine how it should be accredited, installed and used;
- that the Chief Officer remain as the determinant of fire safety requirements and their ongoing suitability.



Technical changes that are required in our NCC

I would like to conclude this article, with my own personal opinions as to where and how the NCC needs to be changed and how and why we can easily have a more robust NCC supported by sound Standards for technical requirements.

We need to look at both other countries and other similar product types here in Australia I think to find the answers.

They are staring us in the face, and with all the hype and organised panic, perhaps we are not stopping and looking?

It is my personal and strong view that we need another out of cycle NCC amendment.

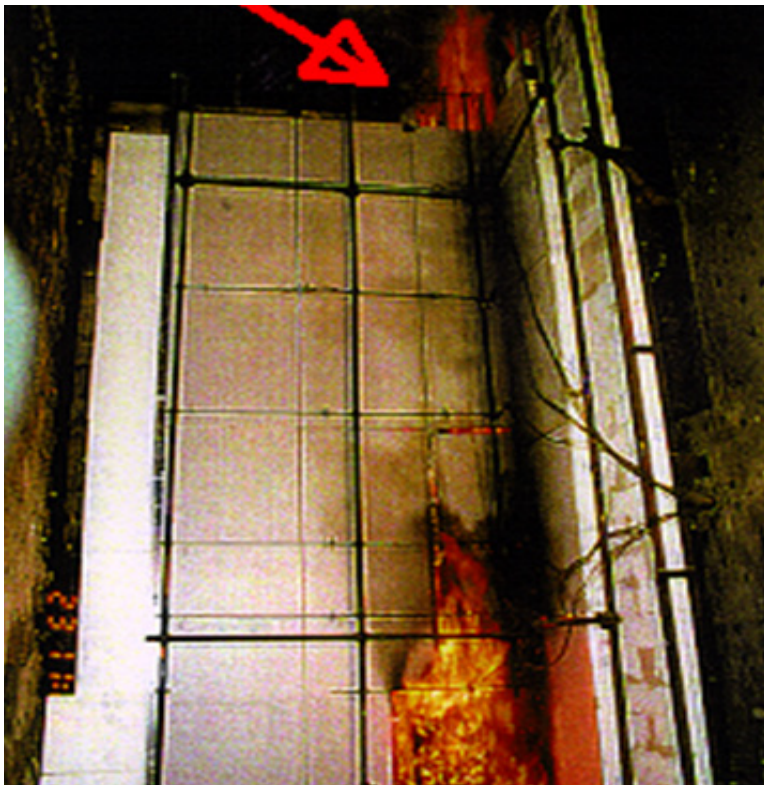
There are some very good overseas full-scale SYSTEM fire test for vertical fire spread pertaining to the external building envelope.

I say SYSTEM here, as our judgement is being clouded collectively over the APC-PE issue.

Yes APC-PE is highly flammable once the core is alight and vertical fire spread has been shown to be rapid, but there are other System components we need to consider.

System fire test methods exist for conventional curtain wall construction where glass facades cover many of our high-rise commercial office towers.

System fire test methods also exist for what are often termed as rainscreen or ventilated facades, which are the category for what we are commonly referring to as “cladding”



I have used the term SYSTEM deliberately, as it is the entire building envelope SYSTEM that need to deal with a fire, not just the cladding.

A building envelope (cladding) SYSTEM consists of:

- the framing that supports the façade
- the fixings of the framing to the structure of the building,
- the flexible or rigid weather protective membrane protecting the inside of the building (often referred to as sarking or building wrap)
- thermal insulation materials used to comply with Section J requirements
- the aesthetic covering or so called cladding, whether it is an ACP, fibre cement, metal, masonry or the like inclusive of paint, render or coating system,
- any joint or ceiling materials,
- any external paint coating or render system.

Would you all agree with this definition?

What important element have I missed?

Think about it for a minute and no NOT cheat and read ahead!!!!!

Got it?

So called **CAVITY BARRIERS**

I really do not like this term, but cavity barriers are perimeter fire stop materials used to help stop vertical fire spread in the cavities behind a curtain wall, or within the cavities behind external and so called rainscreen or ventilating cladding material.

These horizontal cavity barriers are often called perimeter fire stopping or slab edge protection and they stop vertical or internal fire spread inside the cavity which acts like chimney in a real fire.

It is important to note that there are also vertical cavity barriers use to stop horizontal fire spread, inside the cavity around an entire floor of a building.

Passive Fire NCC requirements

I am going to digress here and talk about the analogies with passive fire protection requirements in NCC and associated technical standards.

NCC uses a 3 step approach:

Step 1 – Test method for SYSTEM fire testing

NCC requires passive fire protection SYSTEMS to be fire tested to AS1530 Part 4 – 2014

Step 2 – Companion standard for variations to fire tested system and ancillary benefits

AS1530 Part 4, has some has a companion documents, which NCC also reference which help deal with allowable variations or rules for variations for what is fire tested to AS1530 Part 4 – 2014 along with guidelines for installation, and documentation to assist with identification and ongoing inspection and testing (maintenance of fire equipment).

Some companion standard examples are:

Penetrations and control joints – AS4072.1

Steel protection – AS4100 – fire section

Fire dampers – AS1682.1 & AS1682.2

Fire doors – AS1905.1

Fire shutters – AS1905.2

Duct fireproofing – AS1668.1 partially

Cavity barriers – NIL?

Step 3 – Performance level or fire classification system for regulatory purposes under deemed to satisfy or prescriptive requirements

The actual fire rating required, are provided in the NCC itself, and we know they manifest themselves as FRL's (commonly referred to as fire ratings).

So let's get back to cladding and external building envelopes.

Proposed cladding NCC requirements

If we use the passive fire protection analogy, I just explained above, and overseas best practice, what should or what could the NCC deemed to satisfy requirements look like for the building envelope and mitigating flame spread?

Step 1 – Test method for SYSTEM fire testing

BS8414-1, BS8414-2 and equally ISO 13782-2 are well documented and widely used test methods in other countries.

Step 2 – Companion standard for variations to fire tested system and ancillary benefits

BS9414 is part of the way to doing this job for us here locally

Step 3 – Performance level or classification system for regulatory purposes under deemed to satisfy or prescriptive requirements

Fire rating or performance level based on classification against a fire test method.

It just makes sense, but why don't we have one yet?

I think we are trying to, but the speed is slow and the old bureaucracy I talked about earlier might be at play.

A Nationally agreed approach might be too slow and we may never get consensus.

One state or territory might need to do their own amendment and jump the gun and help lead the others to the starting gate?

Let's talk about NCC Clause CV3 as some of you reading this might think I was unaware of it?

CV3 is a new Verification method implemented around cladding!

By referencing AS5133, CV3 incorporates 2 of the important 3 requisite steps for the proposed NCC deemed to satisfy requirements, identified, akin to passive fire protection I identified by way of referencing AS5113.

AS5113, is not a fire test method, like many people think and many suppliers of cladding are stating in their literature. It is a classification system.

It does reference the requisite fire test methods which include BS8414-1, BS8414-2 and equally ISO 13782-2

CV3 introduces a psuedo fire rating or performance level by way of the EW classification which is based on results from the fire testing.

Nearly everything we need is there!

So why isn't all this in the NCC as a deemed to satisfy provision now? For mine it should be

Sadly CV3, requires a job specific report from a fire safety engineer and for some reason there is an additional requirement to put sprinklers of balconies, which if my reading is correct, is not a requirement anywhere else unless you opt to use CV3.

A quick comparison..
AS5113 vs BRE BR 135 & LPS 1582 used in the UK

BRE BR135 and LPS 1582 are pretty much the same as our own and relatively new AS5113

All of the above allow the use of BS8414 fire testing.

There are 2 very different performance criteria in AS5113, compared to either of BRE BR 135 and LPS 182.

Temperature of failure at Level 2 – 5 metres above the fire test specimen

The UK classification documents both use 600 deg C and AS5113 requires 250 deg C

Debris criteria

BRE BR 135 & LPS 1582 do not allow burning debris at floor level and define times for failure for any burning debris.

AS5113 requires a minimum of 2kg of debris in total for the duration of the fire test.

Personally, I can see why a debri criteria has been included, but I think the current criteria is too conservative and currently the only reason why globally accepted cladding SYSTEMS are not being used in Australia.

My quick fix suggestions for NCC

Deemed to satisfy provisions

1. Tidy up Clause C2.6 for cavity barriers in to ensure these important system components are included in our buildings; that is remove the convenient loopholes that are being used.
2. Remove EW classification in AS5113.
3. Add new EW classifications into NCC perhaps by building Class? Review temperature of failure and quantity of debris failure limits.
4. Add AS5113 into prescriptive clause as the only pathway for compliance.
5. Remove existing clauses referring to AS1530.1 as a compliance pathway.
6. Add sprinkler on balconies if they stay in CV3.

Verification Method - CV3

1. Consider the omission of the need for a fire safety engineers involvement considering conservative nature of AS5113.
2. Remove the need for sprinklers on balconies if not being added to Deemed to satisfy provisions.

Solid Aluminium

The product of choice by default at present for new build and for recladding is Solid Aluminium.

It worries me that the poor definition of cavity barriers in C2.6 at present sees them omitted from most buildings on the basis that sprinklers are installed in all building above 25 metres.

It also worries me that no spandrels are incorporated in building above 25 metres, as lightweight spandrels and cavity barriers are used to pass fire testing to BS8414 and the like…..

I will finish with a photo of 2 fire tests conducted on solid aluminium.

I let you guess which one has effective cavity barriers, both to stop vertical and horizontal fire spread in the cavities behind the solid aluminium cladding

Both fire tests incorporated non-combustible mineral fibre insulation aka Rockwool for those who know it as Rockwool !!!!