



**FIRE**  
**EMERGENCY**

NEW ZEALAND

# ASSOCIATION OF BUILDING COMPLIANCE

Simon Davis: Fire Engineering Manager



# RAISING THE BAR

COMPLIANCE: THE LAST LINE OF DEFENCE

# INTRODUCTION

- Recent fires highlight the potential for catastrophic failure
- Strength of the NZ Building Act is the Compliance Regime post occupation
- These fires emphasise the need for all fire safety systems to operate effectively, both active and passive
- Fire will find the weakest link

# BACKGROUND:

## Fire and Emergency NZ

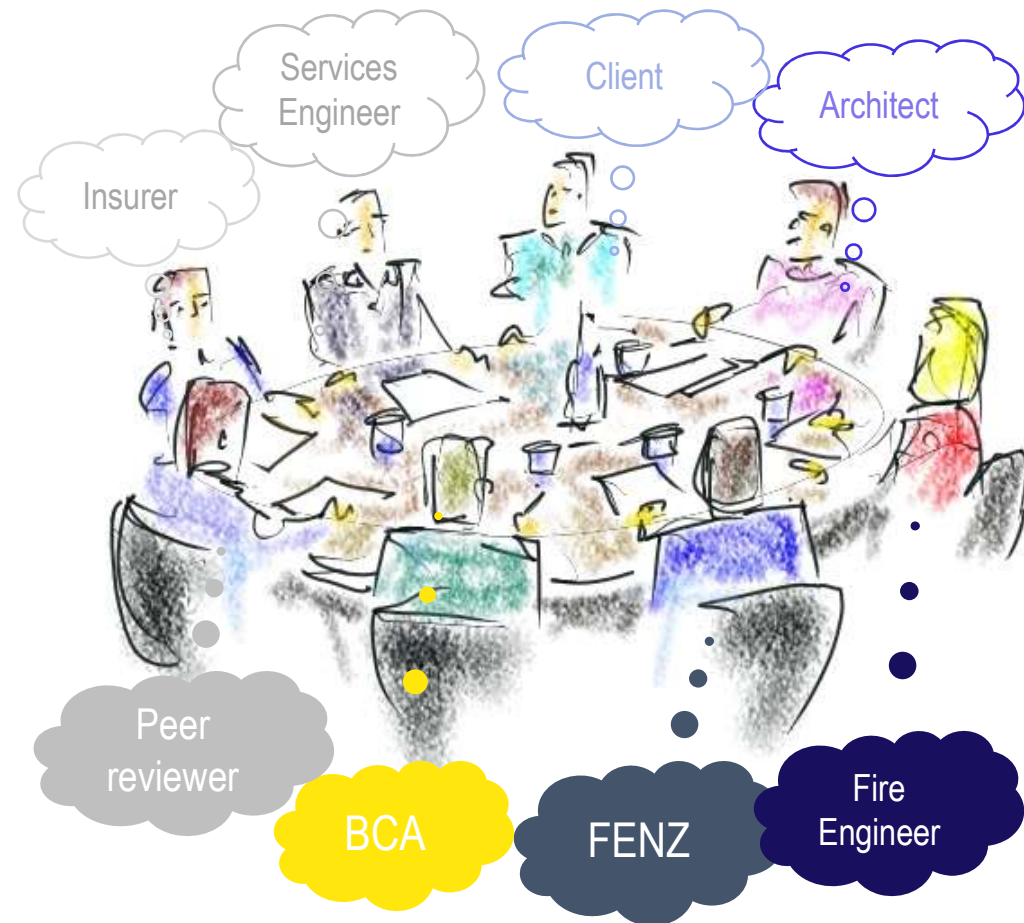
- Established 1<sup>st</sup> July 2017
- Amalgamation of urban and rural fire organisation's
- Fire engineering unit currently part of the national risk reduction section
- FEU consists of 12 engineers in three centres
- Work consists of:
  - Building Consent reviews (S46)
  - Fire engineering briefs
  - Post incident analysis
  - Research
  - Technical advice & training



# Examples of FEU work:

## The Fire Engineering Brief

- A meeting of stakeholders
- Opportunity to raise concerns & discuss requirements at early stage



# Examples of FEU work

## **POST INCIDENT ANALYSIS:** Heads up Reports

A summary of findings from unusual fires

<https://fireandemergency.nz/research-and-reports/product-recalls-and-heads-up/?category=Heads%20Up>

## **RESEARCH:**

A study of the use of fire extinguishers (2015)

<https://fireandemergency.nz/assets/Documents/Research-and-reports/Report-148-Impact-of-HOFFE-changes-for-nonresidential-buildings.pdf>

## Lessons to learn?

Overseas and NZ experience give us the opportunity to learn from incidents.

Regard every fire as a failure but also an opportunity to learn!

# Lakanal House:

## London 2009

- 6 Dead (3 children)
- Passive fire protection corrupted by installation of HW system in 2006
- £570,000 Fine for Council

Assistant Commissioner for Fire Safety (London Fire Brigade) Dan Daly said:

*All landlords, including large housing providers, such as councils and housing associations, have a clear responsibility under the law to ensure that their premises meet all fire safety requirements and are effectively maintained to provide protection in the event of a fire and keep their residents safe*







# Shirley Towers

## Southampton 2010

2 fire-fighters died

Poor operational procedures as fire-fighters got above a developing fire





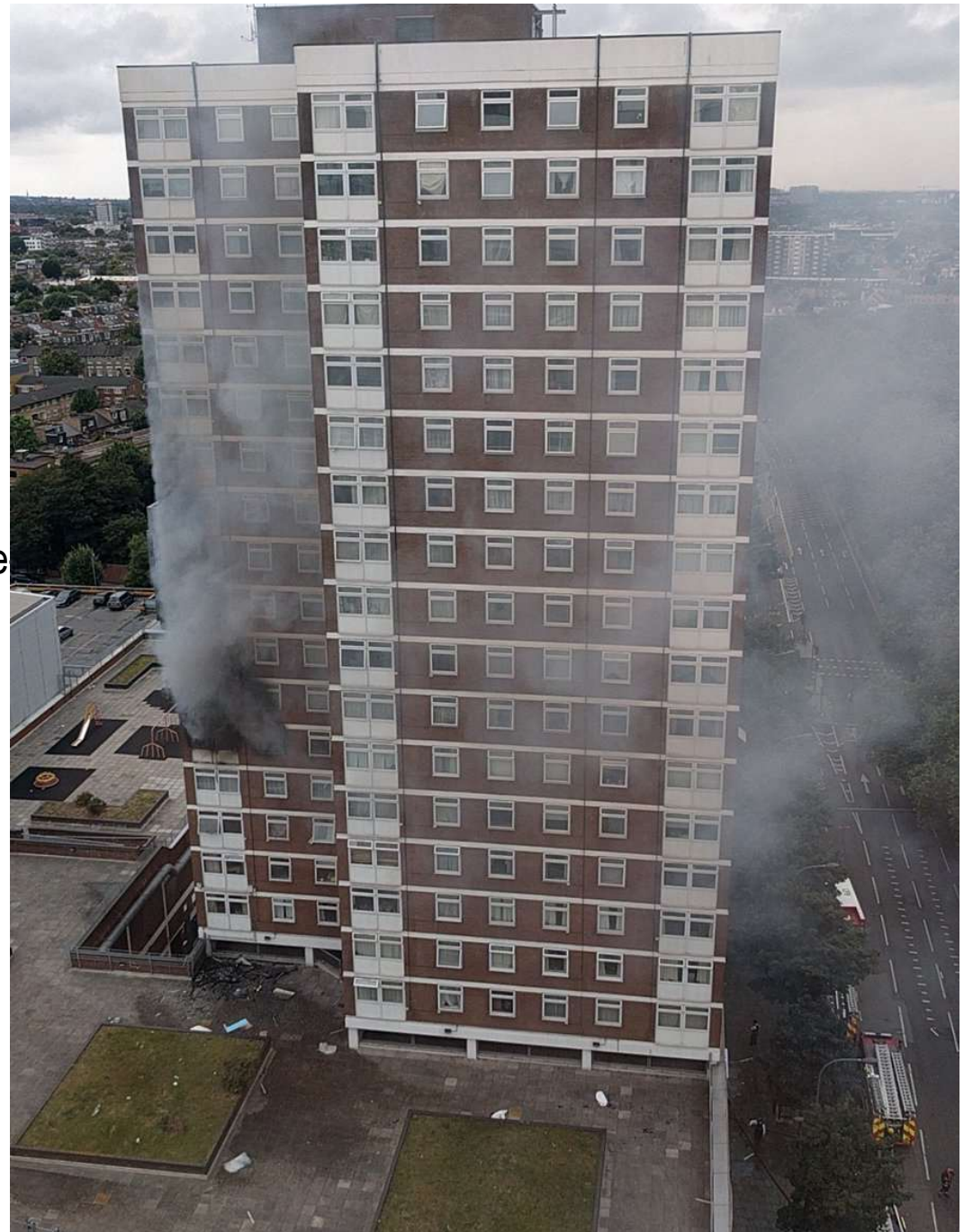
# Shepherd's Bush

## London 2016

17 storey with car parks below

No deaths but 5 flats affected

Just in reach of external fire attack but fire fighters died internally



# Bankstown

## Sydney 2012

2 people jumped from 5<sup>th</sup> floor apartment  
1 died and 1 is a paraplegic  
52 rescued by FRNSW

Side note:

Coroner concludes apartment buildings  
under 25 m should be sprinklered  
FRNSW and CSIRO investigating  
sprinkler systems run from domestic  
plumbing or hydrant



# Facade Fires

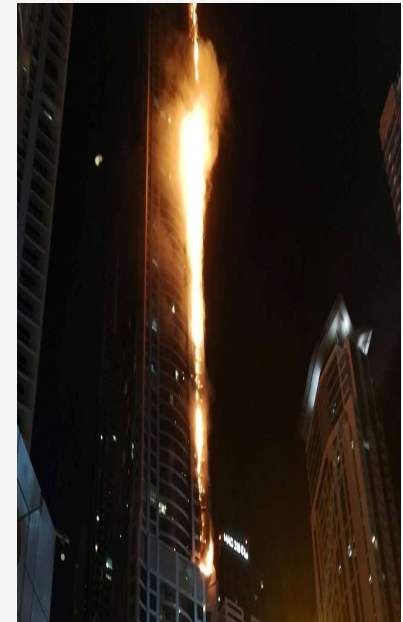
Saved by the installation of sprinklers:  
One system mitigating the failure of  
another!

## DUBAI 2012

Address Hotel

Torch (twice): 79 Storeys

## GROZNY 2013



## Docklands

### Melbourne 2016

- No fatalities
- 23 levels, 400+ residents
- Fire started on 8<sup>th</sup> floor on balcony
- 26 heads operated





# Grenfell Tower: London 2017

80+ deaths

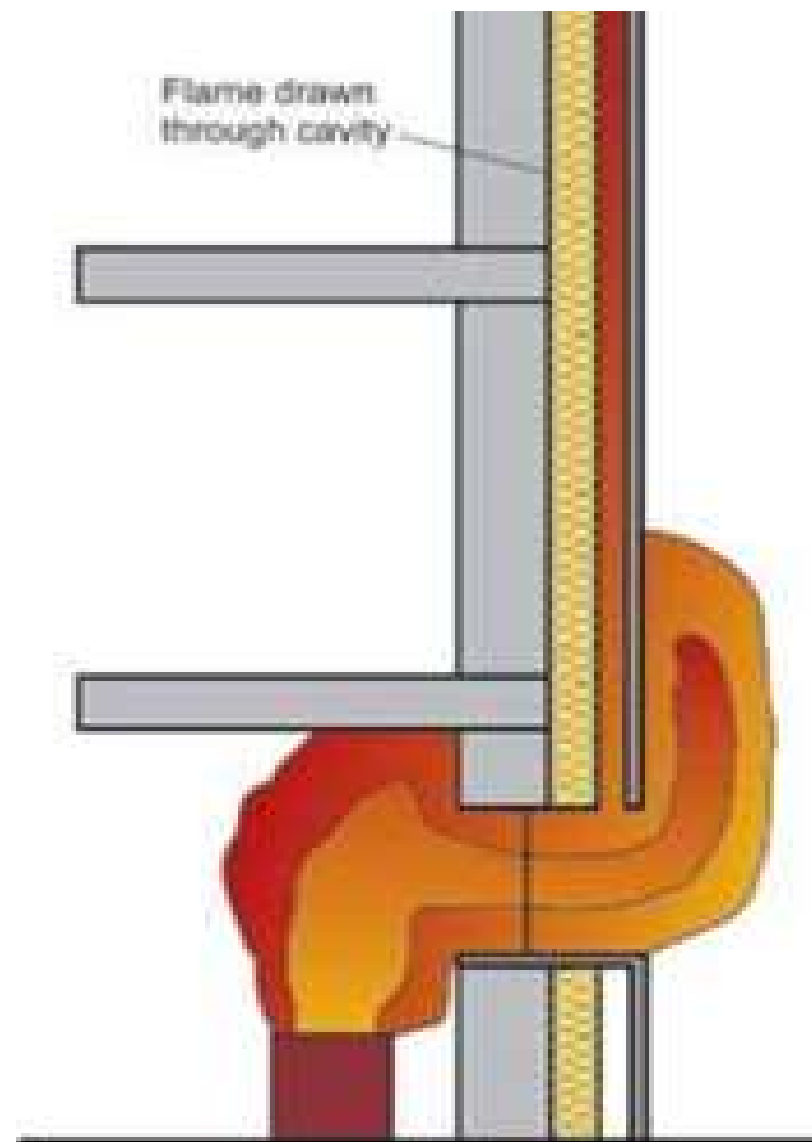


## Cladding

Many of the fires described had extensive fire spread attributed to cladding.

In the Docklands fire, the ABCB have decided to have sprinklers installed on balconies. This is a reversal of a previous position.

Suggestions as to cause of Grenfell Tower include a leaking refrigerator and that fire-fighters pushed the fire externally and set fire to the cladding





# NZ Experience?

- National Commanders Instruction (NCI 56/P3) outlines escalation triggers
- Triggers to involve engineers:
  - Fire in large crowd occupancy (>100 people)
  - Fire in sleeping accommodation - non-residential
  - Fire spread across boundary or fire compartment
  - Failure of occupants to escape/rescue required
  - Inadequate fire-fighting water supply
  - Failure of fire safety system
  - Anytime where a PIA will be of significant benefit in capturing relevant information.

# Christchurch YMCA Fire

September 2013

## Building Description

- Ground-floor café and facilities (gym, etc.)
- Level 1 to 5 bedrooms
- Building sprinklered
- Concrete floor slab



# Fire Details

- Very simple fire operationally
- System activated and automatically called NZFS
- Fire was out on arrival of appliance
- Minimal damage
- No one was injured

# Cause of Fire

- Fire started in ground-floor café kitchen
- No sprinkler activation in kitchen





# Why the PIA?

- However, sprinklers in roof cavity activated - five levels above the known point of origin!



# Fire Spread

- Lack of sprinkler activation in kitchen
- Very light soot deposit in extract duct  
→ the fire travelled up quickly





# Fire Spread

- No dampers in kitchen extract – typical
- Levels 4 and 5 ductwork was 'Flexiduct'
- Traps grease deposits
- Unable to contain the fire



# Riser Issues

- Not only kitchen extract duct in riser
  - HVAC, Water, Sewage, Electrical, Comms
- Lack of effective fire stopping
- Poor riser layout makes servicing impossible



# Lessons Learnt

- Never use flexible ducts in kitchen extract
- Designers should specify which fire stopping option is to be used for each riser
- Consider dedicated kitchen risers
- Consider servicing requirements for risers (e.g. 'hot' and 'cold' risers)



# Fat Badgers Pizzeria

May 2013

## Building Description

- Two level plus mezzanine floor
- Bar and restaurant
- Two firecells
- Automatic alarm

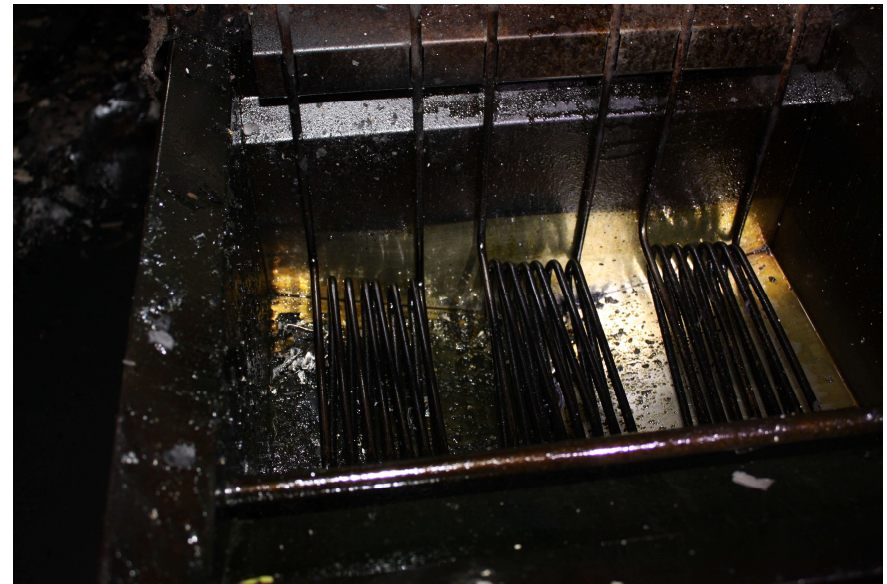


# Fire Details

- 5<sup>th</sup> Alarm, 9 appliances
- Small fire three days earlier
- Protection of adjacent buildings
- Building demolished and so far not rebuilt
- No one was injured

# Cause of Fire

- Fire started in deep-fat fryer in Pizza restaurant
- Oil level below level of thermostat
- Loss of temperature control of fryer unit





# Development of Fire

- Kitchen extract included an expansion/  
vibration joint allowed fire to spread into the  
riser



# Development of Fire

- Penetrations through wall allowed fire to spread into the upper level bar
- Residue in ductwork?



# Design Issues

- Effective fire separations provide significant benefit – new construction
- Failure of fire separations resulted in the damage to the World Bar



# Lessons Learnt

- Lack of effective fire stopping contributed to fire spread
- Effectiveness of sprinklers at mitigating damage
- Sprinklers are usually effective – with risks for which they are designed
- Circumstances change – can affect fire and failure scenarios
- Critical assessment at each inspection
- No substitute for checking!



# Summary:

- No large fire loss recently in NZ yet!
- HOBANZ report serious fire safety systems in all 20+ apartment reclads
- Grenfell Tower fire will have on-going impact
- Importance of vigilance
- Prepare for more stringent requirements



## Fire Safety and Evacuation of Buildings Regulations

Department of Internal Affairs have issued a discussion document for public comment:

Opportunity to have your say on aspects such as owner responsibilities, first aid fire-fighting and practicality of fire designs.

[https://www.dia.govt.nz/vwluResources/Proposals-for-FENZ-regulations-August-2017-PDF/\\$file/Proposals-for-FENZ-regulations-August-2017-PDF.pdf](https://www.dia.govt.nz/vwluResources/Proposals-for-FENZ-regulations-August-2017-PDF/$file/Proposals-for-FENZ-regulations-August-2017-PDF.pdf)

# The Future?

- Introduction of inspectors (FENZ Legislation) with legal recourse
- New Fire Safety Regulations and Building Fire Framework (more integration)
- Requirement for all IQP's to have formal qualifications and assessments
- National register
- Introduction of better documentation (operating and maintenance manuals for buildings)



## FIRE SAFETY SYSTEMS 7 HUMAN BEHAVIOUR

Nothing goes as planned or expect the unexpected!

[Pak N Save Fire with clock.wmv.wmv](#)



