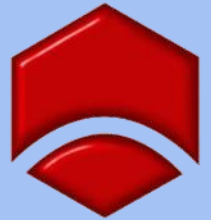


Performance Requirements 2022

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ENGINEERS
AUSTRALIA
SOCIETY OF
FIRE SAFETY

ABCB Proposal

- Quantify Fire Safety Performance Requirements for 2022
- Remove/reduce subjectivity in level of safety
- “Engineers should not set the minimum level of safety”



Goal #1 - ABCB Goals for NCC Contents

When determining the content of the NCC, the ABCB seeks to -

- 1. Ensure requirements have rigorously tested rationale; and*
- 2. Effectively and proportionally address applicable issues; and*
- 3. Create benefits to society that outweigh costs; and*
- 4. Consider non-regulatory alternatives; and*
- 5. Consider the competitive effects of regulation; and*
- 6. Not be unnecessarily restrictive.*

#Goal 2 - Hazards, Goals & Consequences Not Mitigation Measures

EP1.1 Fire Hose Reels

A **fire hose reel system** must be installed to the degree necessary to allow occupants to safely undertake initial attack on a fire appropriate to...

Fire hose reel is a mitigation measure

Only a fire hose reel, or removal of it, can meet this requirement.

SFS Proposal for FS4 - First Attack

A **means of which to allow occupants to undertake initial attack on a fire must be provided** to the degree necessary, appropriate to...

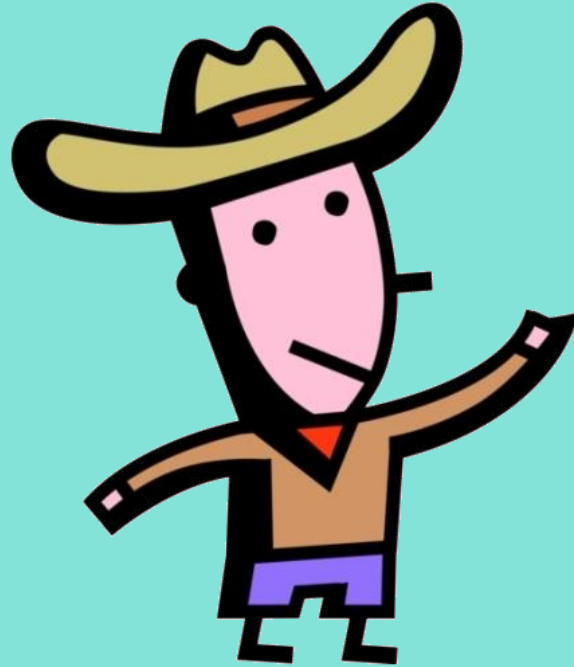
Providing a means of a first attack is a goal

Any means of first attack can meet this requirement.

Goal #3 - Verifiable Targets



Goal #4 Capture the Code



Designs &
DtS Provisions

**Goal #5
Methods
Approaches
Tools**

<i>Approaches</i>	<i>Methods</i>	<i>Tools</i>
Qualitative	Deterministic	Comparative
		Absolute
	Probabilistic	Comparative
		Absolute
Quantitative	Deterministic	Comparative
		Absolute
	Probabilistic	Comparative
		Absolute

ABCB Concept

FS1 Occupant safety in the case of fire

- (a) In the event of a fire in a building, occupants must be provided with an *Available Safe Evacuation Time* that is greater than the *Required Safe Evacuation Time* with a *reliability of safety* of 99.9%.
- (b) For the duration of the *Available Safe Evacuation Time* and *Required Safe Evacuation Time* referred to in (a) occupants must not be exposed to—
 - (i) a temperature exceeding XXXX; or
 - (ii) a level of visibility less than XXXX; or
 - (iii) a level of toxicity exceeding XXXX; or
 - (iv) injury caused by structural instability.
- (c) The period of time occupants take to evacuate referred to in (a) must be appropriate to—
 - (i) the number, mobility and other characteristics of the occupants; and
 - (ii) the function or use of the building; and
 - (iii) the travel distance and other characteristics of the building; and
 - (iv) the *fire load*; and
 - (v) the potential *fire intensity*; and
 - (vi) the *fire hazard*; and
 - (vii) any active *fire safety systems* installed in the building; and
 - (viii) *fire brigade* intervention.





- Safety factors (SF)
- Individual risk limits
- Different SF for classes
- Base case and sensitivity SF
- *Visibility reliability of safety vs Thermal reliability of safety*

FS1 - Occupant Life Safety (EP2.2 v2.0)

- A. In the event of a fire in a building the conditions in any *evacuation route* must be maintained for the period of time occupants take to evacuate the part of the building so that:
 - i. The temperature, including radiation, will not endanger human life; and
 - ii. The level of visibility will enable the *evacuation route* to be determined; and
 - iii. The level of toxicity will not endanger human life.
- B. The period of time occupants take to evacuate referred to in (A), and the impact of fire fighting operations in (C), must be appropriate to:
 - i. The number, mobility, and other characteristics of the occupants; and
 - ii. The function or use of the building; and
 - iii. The travel distance, other characteristics of the building; and
 - iv. The *fire load*; and
 - v. The potential *fire intensity*; and
 - vi. The *fire hazard*; and
 - vii. Any *fire safety systems* installed in the building and the reliability and effectiveness of those systems, and
 - viii. The dimensions, numbers, and locations of exits and paths of travel to exits; and
 - ix. Level of protection provided to the evacuation routes; and
 - x. Height of the building; and
 - xi. The **evacuation strategy**.
- C. For buildings where with firefighting operations may coincide with, and impact on, occupant evacuation, smoke and fire spread via fire isolated shafts must be limited for the duration of occupant evacuation.

ABCB FS2 Concept

FS2 Fire brigade intervention

Where a *fire brigade station* is no more than 50 km from the building as measured along roads—

(a) access must be provided to and around a building for *fire brigade* vehicles and personnel to facilitate *fire brigade* intervention appropriate to—

- (i) the function or use of the building; and
- (ii) the *fire load*; and
- (iii) the potential *fire intensity*; and
- (iv) the *fire hazard*; and
- (v) any active *fire safety systems* installed in the building; and
- (vi) the size of any *fire compartment*; and

(b) a fire hydrant system must be provided to facilitate the needs of the *fire brigade* appropriate to—

- (i) fire-fighting operations; and
- (ii) the *floor area* of the building; and
- (iii) the *fire hazard*; and

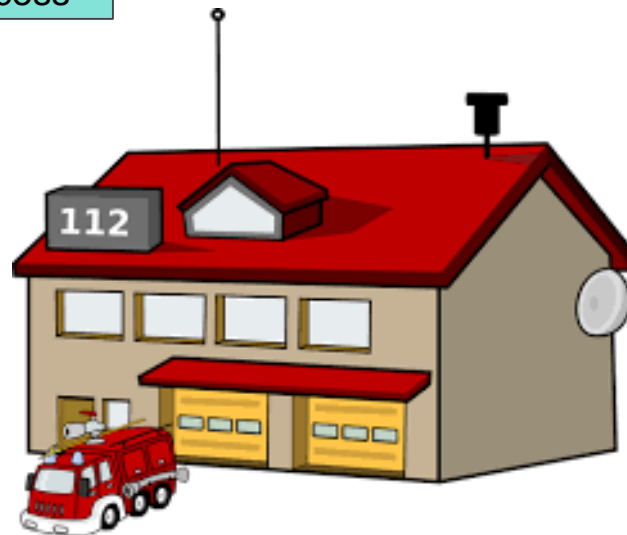
(c) suitable facilities must be provided in a building to co-ordinate *fire brigade* intervention during an emergency appropriate to—

- (i) the function or use of the building; and
- (ii) the *floor area* of the building; and
- (iii) the height of the building; and
- (iv) the *fire hazard*.

Access

Hydrants

Coordination Facilities



FS2 - Fire Brigade Intervention (Part 1 of 2)

A. Access must be provided for fire brigade vehicles and personnel to facilitate fire fighting operations appropriate to the following:

- i. The function or use of the building;
- ii. The fire load;
- iii. The potential fire intensity;
- iv. The fire hazard;
- v. Any installed fire safety systems;
- vi. The size of any fire compartment;
- vii. The height of the building;
- viii. Firefighting activities; and
- ix. Available fire fighting equipment and appliances.



Access



Safe Access for Attack

B. Where fire-fighting operations necessitates entering a building, access within the building with appropriate *brigade tenability* must be maintained for the period of time of brigade intervention in **firefighter access routes** and **set up areas** appropriate to the following:

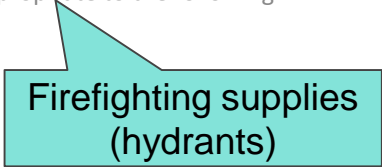
- i. *Fire fighting activities;*
- ii. The hazard to which firefighters are exposed;
- iii. **Wayfinding characteristics for intervening firefighters;** and
- iv. The installed fire safety systems.

FS2 - Fire Brigade Intervention (Part 1 of 2)

- C. Suitable facilities must be provided in a building to co-ordinate *fire fighting operations* during an emergency appropriate to:
- i. The function or use of the building;
 - ii. The floor area of the building;
 - iii. The geometry and the building layout;
 - iv. *Firefighting activities*; and
 - v. The fire hazard.
- D. In the event of a fire, suitable means to facilitate *firefighting activities* must be provided appropriate to the following:
- i. The fire load;
 - ii. The potential fire intensity;
 - iii. The **appropriate extinguishing mediums**;
 - iv. *Fire-fighting operations*;
 - v. The geometry of a fire compartment;
 - vi. Installed fire safety systems and the reliability and effectiveness of those systems;
 - vii. Ability of the fire brigade to undertake external attack operations; and
 - viii. Risk of fire spread to another property.



Coordination Facilities



Firefighting supplies
(hydrants)

FS3 Risks to Public



FS3 Risks to the public

In the event of a fire in a building—

- (a) likelihood of fire spread to adjacent buildings must be minimised; and
- (b) likelihood of structural collapse must be minimised; and
- (c) a concrete *external wall* that could collapse as a complete panel must be designed so that the likelihood of outward collapse is avoided.

FS4 - First Attack

Fire Distinguisher



A means of which to allow occupants to undertake initial attack on a fire must be provided to the degree necessary, appropriate to -

- A. The function or use of the building;
- B. Any other *fire safety systems* installed in the buildings;
- C. The *fire hazard*; and
- D. The characteristics of occupants.

Existing Performance Requirements

Nothing definitive but:

FS1 = DP4 + DP5 + DP6 + EP2.2

FS2 = EP1.3 + EP1.9 + CP9

FS3 = CP2(a)(iii) + CP5

FS4 = EP1.1 + EP1.2

Unnecessary repetitions are often useless, redundant and unnecessary.

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Collectively they also address: CP2(a)(i)(ii)(iv), CP3, CP4, DP7, EP1.4

Design, Test, Refine, Repeat

- Test against both DtS Designs & Performance Based Designs
- Data, data, data!
- Statistics on current FSE practices
- \$\$\$ / change
- Industry engagement
- Framework for qualitative assessments
- Education