



ENGINEERS
AUSTRALIA
SOCIETY OF
FIRE SAFETY
NSW CHAPTER

Practice Note

For

Fire & Life Safety in Existing Buildings During Construction

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NSW Chapter
Engineers Australia

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Preamble

Recent fire incidents in Sydney, Shanghai and Weeroona^(xi) have demonstrated that construction works may present a significant fire hazard where construction works interface or integrate with existing occupied parts of a building.

Current building legislation does not require partially occupied portions of buildings undergoing construction works to meet the building code provisions during construction.

Consideration must therefore be given to managing fire and life safety during the construction phase for those parts of the building that are permitted to be occupied whilst construction works proceed.

If it cannot be agreed that there will be an acceptable level of fire safety during the construction phase, then it may be prudent to consider vacating the building for this period.

This Practice Note (PN) provides a means for dealing with this issue. The key priority is life safety as construction works can provide unique hazards and risks that impact on occupants outside of the construction zone. The principal recommendation of this PN is the development and implementation of a strategy – an Interim Fire Safety Strategy (IFSS).

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1. Introduction

Where building or demolition works interface with existing occupied parts of a building, consideration should be given to managing fire and safety during the construction phase for those parts of the building that are permitted to continue to be occupied.

Construction works can present hazards and risks that may impact on occupants outside of the construction zone - for example, removal or temporary decommissioning of fire safety systems; modification or removal of existing fire-resisting building elements; dangerous processes; flammable liquids and gases; changeable and concentrated increased fire load; obstruction of exits and paths of travel to exits; and interference with the latching/operating mechanisms of fire and other doors in order to allow ready movement of building materials, equipment and workers to and from the construction zone. The types of hazards and the level of risk will vary from project to project and the level of attention paid to safeguarding the occupants outside the construction zone. Also, a fire may occur either within or outside the construction zone.

Recent US statistics presented to the 2011 Fire Safety Engineering International Conference^(xi) on this subject reported an estimated 4,800 construction site fires occur annually with an estimated \$35 million dollars in property loss. The primary reported causes of construction fires are 41% incendiary/suspicious acts, 30% open flame, and 5% smoking related reasons. Another report by NFPA indicates that construction fires represent 6% of those reported and contribute to 13% of financial losses. Other studies have reported that the leading causes of fire are 25% portable heating equipment, 20% cutting/welding equipment and 15% smoking/matches.

The hazards and risks can be lessened if appropriate measures and actions are implemented during the construction process.

Continued occupation of the building during the construction phase should only be allowed if the relevant parties are satisfied that there will be an acceptable level of fire safety. Depending on the scope of the works and hence the significance of its potential fire safety impact, it is recommended that a fire safety strategy be developed for managing fire and life safety for persons occupying buildings undergoing construction works.

This PN specifies a process for developing a fire safety strategy where continued occupation of an existing building is permitted whilst construction or refurbishment works proceed. It also gives guidance on the matters that should be considered under that strategy either to validate existing occupation prior to building works commencing or to permit re-occupation of a vacated building where initially deemed too hazardous to occupy.

2. Purpose and Scope

The purpose of this PN is to provide guidance for the development and implementation of the fire safety strategy where continued occupation of an existing building is permitted whilst construction or refurbishment works proceed. It is an Interim Fire Safety Strategy (IFSS) as its life need only extend for the duration of the construction works.

The IFSS referred to in this PN is intended only to address the safety of persons visiting or occupying parts of the building outside the construction zone. It is not intended to address safety for construction workers.

Although there may be legislative and other obligations to protect these building occupants from the hazards that construction works may present, there is no clear guidance on how this may be achieved. This PN recommends that an IFSS be developed and implemented.

This IFSS should be documented. The document should outline:

- The aims of the strategy; and
- The measures and the actions that will be implemented (during the construction phase) to achieve those aims.

The IFSS should be developed collaboratively by relevant key stakeholders before construction commences. Its recommended measures and actions should be implemented and monitored. The strategy should be flexible and relevant to the particular needs of the development.

A copy of the strategy document should be kept on site, readily accessible and be referred to regularly during the construction phase to determine its continued relevancy. The document may need to be updated as construction circumstances change.

The PN is not intended to provide a definitive checklist. Nor is it intended that it infers liability on any party. It simply provides a recommended means for managing fire and life safety during the construction phase.

3. Application

The recommendations and principles in this PN can be applied to a new building for which permission is granted to occupy in stages.

They may also be applied to an existing occupied building being extended, altered or refurbished. In this scenario, occupation of the building will continue during the construction phase.

3.1. Examples

Two examples are detailed below to illustrate when an IFSS may be applied.

3.1.1. Example 1 – High-rise Building

The building is proposed to be occupied by a single tenant. An intermediate floor is to be refurbished, see Figure 1. The tenant wishes to have an interconnecting stair across the construction levels.

During the construction stage, a lift will be used to transport products to the construction area as well as a fire stair. Also periodic interruptions to the fire safety systems across the entire building are anticipated.

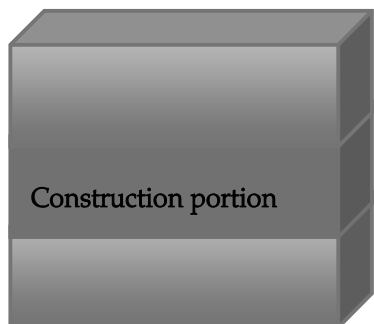


Figure 1 **High Rise Example**

3.1.2. Example 2 – Low rise Building

Two separate existing occupied buildings will be united by a third building, see Figure 2. The construction process will interfere with egress from the two existing buildings and perimeter vehicular access. Again interruptions to fire safety systems within the existing buildings are anticipated.

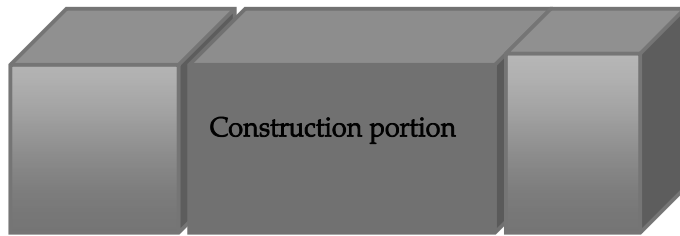


Figure 2 **Low Rise Example**

Note: The above are examples only. The use of an IFSS is not limited to these two circumstances.

3.2. Relationship of Practice Note with Legislation

The need to provide for the safety of persons occupying buildings whilst construction works are taking place may arise under common law, OHS legislation, an insurance policy or other sources.

The Building Code of Australia (BCA) also addresses this issue to a limited extent. Clause E1.9 specifies the fire services it expects to be provided on site as construction works progress.

This PN does not form part of any law. It is intended to simply complement the applicable laws and to assist in legal obligations.

3.3. Roles, Expectations & Responsibilities of Relevant Parties

In general, stakeholders comprise the community, Fire Brigades, tenants/occupiers, local Council, the Accredited Certifier, building owners, building contractors and employees, and insurance companies.

The community expectation is that a building is safe, fire safety apparatus will function correctly in an emergency, and the brigade can undertake fire brigade intervention activities smoothly.

The Fire Brigades expectation is the ability to be able to work safely in and around the building under all weather conditions irrespective of the time of day.

The tenant/s expectation is to have a safe building by virtue of building codes and regulations that is also properly serviced and maintained by the building owner/s.

The local authority expectation is for the building owner to act responsibly, the building having compliance with the relevant building codes and regulations, building and fire contractors to be competent and to ensure the needs of the fire brigade are accommodated.

The accredited Certifier expectation is that the person acting on the consent acts in accordance with relevant Acts / Regulations and the development consent.

The owners expectation is to have reasonable and achievable requirements, appropriate fire protection, tenant or occupant safety, building compliance requirements that wont change at

unreasonable intervals, competent fire contractors, minimum risk insurance protection and equipment that will perform to its design requirements.

Insurance companies underwrite the risk to the owners of the building for its loss or damage and for the safety of the occupants within it who may be subject to illness or injury as a result of their tenancy and expect related stakeholders to comply with relevant statutory responsibilities, consents and industry practice(s) and the terms of the insurance contract and/or otherwise keep them informed of changed circumstances on site.

The following table is a guide as to which stakeholders have some fire safety role to play under *prevailing legislation* for *existing building* interfacing and/or integrating with new building works.

Stakeholder	BCA	OH&S Act/Reg	EP&A Act/Reg	Remarks
Owner	N/A	Some limited obligations in a workplace environment only	Obligation re essential services annual certification and offences signage to fire stairs and the like	Owners generally are not aware of their legal obligations either in whole or in part
Tenant / Lessee	N/A	If employing others, some limited obligations in a workplace environment only	May be some obligation to install and maintain essential services for an existing fit out under contractual obligations	
Occupants	N/A	N/A	N/A	Should benefit from a comprehensive fire safety net of legislative and contractual obligations but it is questionable
Fire Brigades	N/A	N/A	Able to respond and act upon complaints from occupants	Complaints would be the exception not the rule. This is considered a very piecemeal approach to fire safety
Council	N/A	N/A	May have powers under Orders provisions upon complaints from occupants	Complaints would be the exception not the rule. This is considered a very piecemeal approach to fire safety

Stakeholder	BCA	OH&S Act/Reg	EP&A Act/Reg	Remarks
Accredited Certifier	Ensure compliance with BCA E1.9/E1.10	N/A	May have powers under Orders provisions upon complaints from occupants	The role of the Accredited Certifier is essentially limited to compliance (& complaints) with the conditions of the Development Consent
Builder / Contactor	N/A	Obligations under OH&S and work cover	N/A	Confusion as to who is the responsible party- Owner/Builder or Project Manager. There may be contractual conditions shifting responsibility. Fire safety problems caused when project timelines do not align with contractors
Design team	N/A	N/A	N/A	Typically deal with new works only
Insurance company	N/A	N/A	N/A	Need to be informed of changes to their contract requirements to maintain cover. Presumably by the owner

In the case of existing buildings that interface and/or integrate with new building works, in practice it is not clear which stakeholder outlined above actually has responsibility for identifying and maintaining community expectations for fire safety for the occupants of existing affected buildings.

3.4. Limitations

The IFSS recommended by this PN is intended as an interim fire safety “bridging” strategy for a finite term (the construction phase). It is not intended to be used as the basis for a permanent or quasi fire safety upgrade of the occupied portion of the building that is the subject of the IFSS.

The IFSS will of course only be applied when it is agreed by the relevant parties that continued occupation of the building will be permitted whilst construction works proceed. It should not be automatically presumed that this is the case. The relevant parties must be satisfied that there will be an acceptable level of fire safety for occupants adjoining the construction zone during this period. Implementation of an IFSS will assist in this regard.

4. Process (Developing, Implementing, Monitoring and Decommissioning an IFSS)

The IFSS should be developed in close consultation with all relevant stakeholders before construction works commence. Development of the IFSS should be an interactive process involving and securing agreement from relevant stakeholders, inclusive of regulatory authorities (where appropriate).

To secure this agreement, to undertake any necessary analysis, to determine the most appropriate IFSS for the project circumstances, and to expedite production of the IFSS, a person with an appropriate level of knowledge and experience in fire safety and construction matters should take charge of, and be responsible for the development of the IFSS, and the IFSS document. This may be a fire safety engineer or other suitably qualified person.

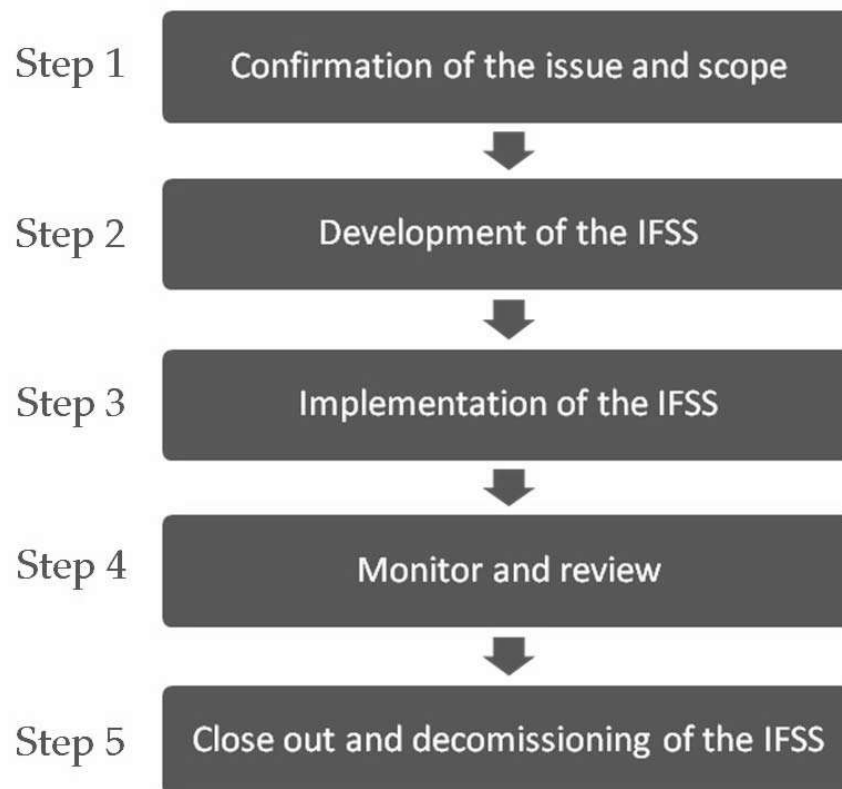
Implementation of the IFSS should be effected by those responsible for the building project.

The IFSS should be continually monitored during the construction phase to ensure the IFSS measures and actions are implemented and continually effective. This is best achieved when the IFSS is developed as a “living document” to adapt to changing construction needs and circumstances on site.

Upon completion of construction works and before occupation or use of a new building stage or modified part of the building, the IFSS should be decommissioned. The permanent fire safety system designed for the building will then apply.

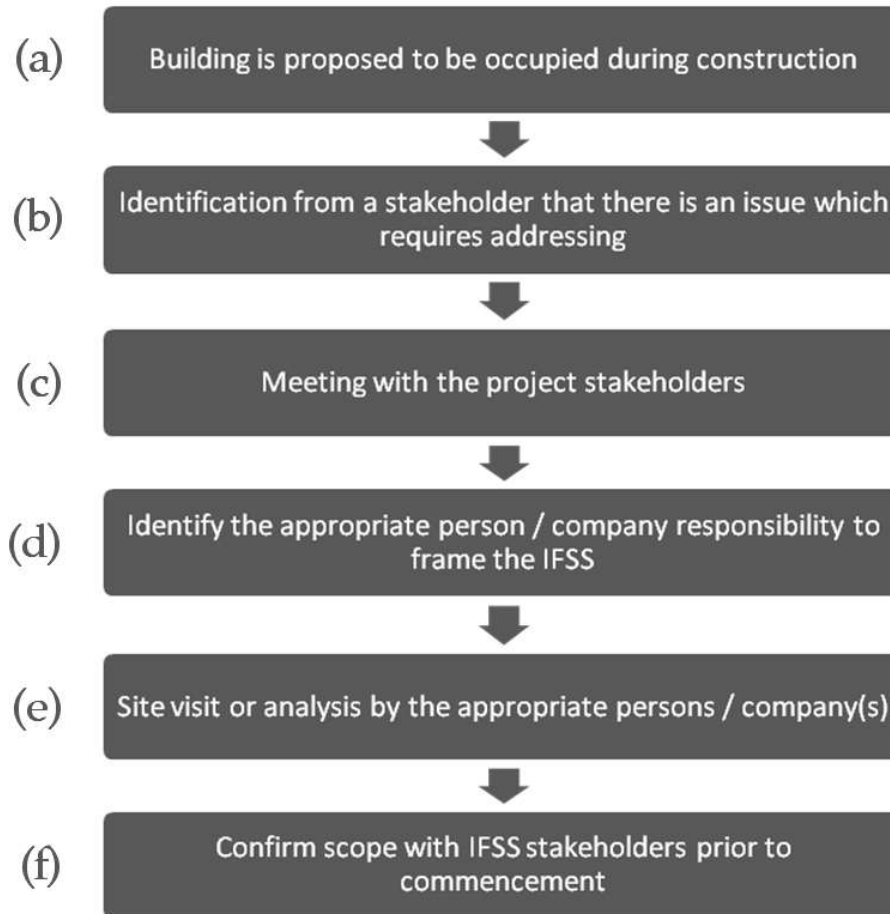
These steps are illustrated in Section 4.1 and each step is then further elaborated upon hereunder.

4.1. Overall Recommended Process for Developing, Implementing, Monitoring and Decommissioning an IFSS



The recommended process for an IFSS is intended to complement the applicable laws governing construction and occupation of a building.

4.2. Step 1: Confirmation of the Issue and Scope



Note: Refer to explanatory notes for each of (a) to (f) below.

The outcomes for step 1 should be a clearly defined scope, identification of the appropriate persons/ to develop the strategy and the commencement of analysis of the design.

Initially it is expected that through stakeholder consultation that the issue of staged occupation of the building will be raised and this will generate some discussion about how best to deal with staged occupation. This may mean stakeholders need to investigate regulatory compliance (and non-compliances) during this period together with the ability of the buildings active services to facilitate staged operations.

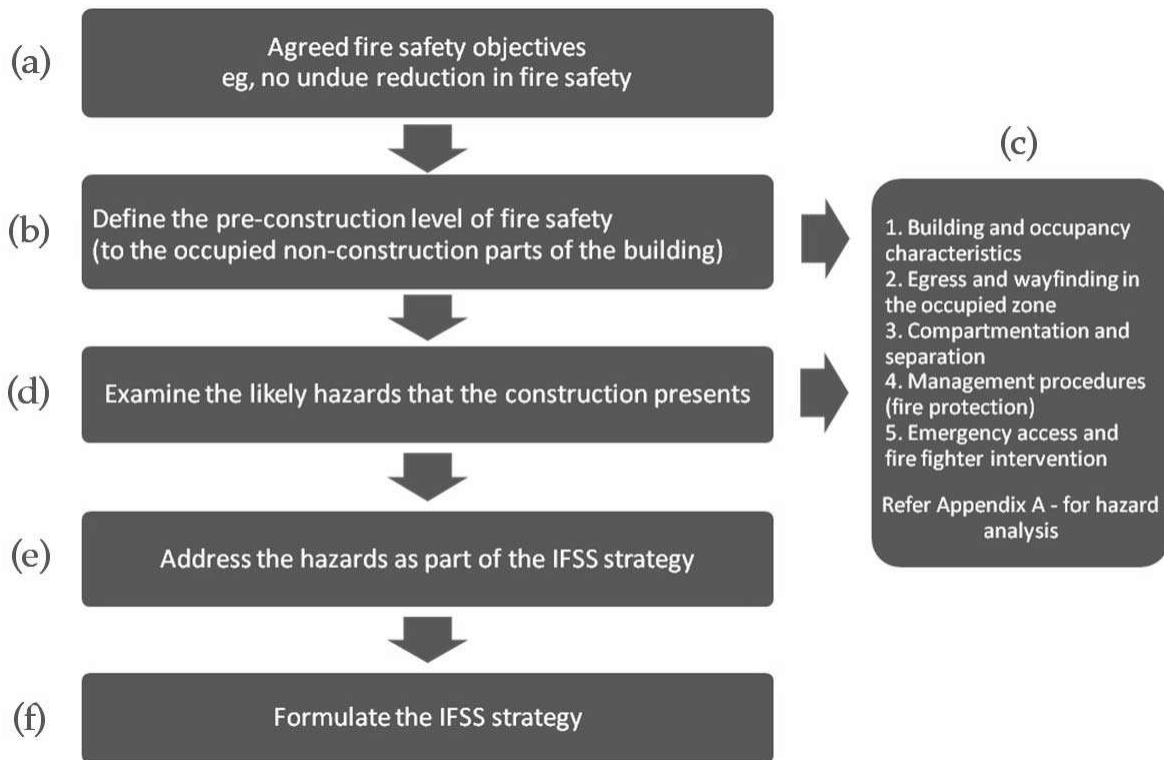
When consultant stakeholders have initiated discussions, reviews and possibly assessments, it is recommended that a meeting or meetings be held to discuss strategy options and identification of the person/s most suitable to developing the IFSS for the construction period. A site visit may not always be necessary or appropriate, however is included as this may assist to understand the situation where appropriate.

The following sub-points correspond to the steps in the figure above:

- (a) The occupied portion may be situated above or below or adjacent to the construction zone. In certain cases such as retail or commercial fit outs the construction zone may be within the occupied area, or a combination of any of the above;

- (b) The issue(s) to be identified may be minor in nature such as access to a fire hose reel being temporarily blocked or comprise several significant issues with potentially significant detrimental impacts to life safety;
- (c) Relevant stakeholders (IFSS Management Committee) to be identified and agreed as appropriate to the nature of the risk as either minor or significant;
- (d) In the case of a minor issue this may be the project manager or in the case of a potentially significant hazard this may require the services of a specialist fire safety consultant or fire engineer;
- (e) Recommended in all but very minor potential risk scenarios; and
- (f) This is to establish and agree in principle the relevant fire safety objectives and likely outcomes, including the agreed time period for implementation and close out of the IFSS.

4.3. Step 2: Development of the IFSS



The outcomes for step 2 should be a draft IFSS that addresses the agreed fire safety objectives. The backbone of the strategy is an analysis of the expected (or current) level of fire safety during occupation.

This includes assessment of the dominate occupant characteristics, the passive and active fire safety measures, egress and wayfinding, together with an examination of the fire safety hazards associated with construction and occupation as well as fire fighter intervention.

For consistency in design and assessment of an IFSS, it is recommended to encourage an interactive process involving, and securing agreement from, relevant stakeholders and for ease of approval should adhere to the following heads of consideration:

4.3.1. IFSS Suggested Heads of Consideration

- (a) Identify construction and non construction areas;
- (b) Identify the likely programme and staging milestones;
- (c) Identify hazards;
- (d) Identify preventive and protective measures;
- (e) Profile occupant and building characteristics;
- (f) Select and secure agreement on a suitable acceptance criteria;
- (g) Utilise specific means by which to benchmark achievement of the acceptance criteria; and
- (h) Ensure that stakeholders, including regulatory authorities, are kept informed of developments adversely impacting upon the agreed and approved IFSS.

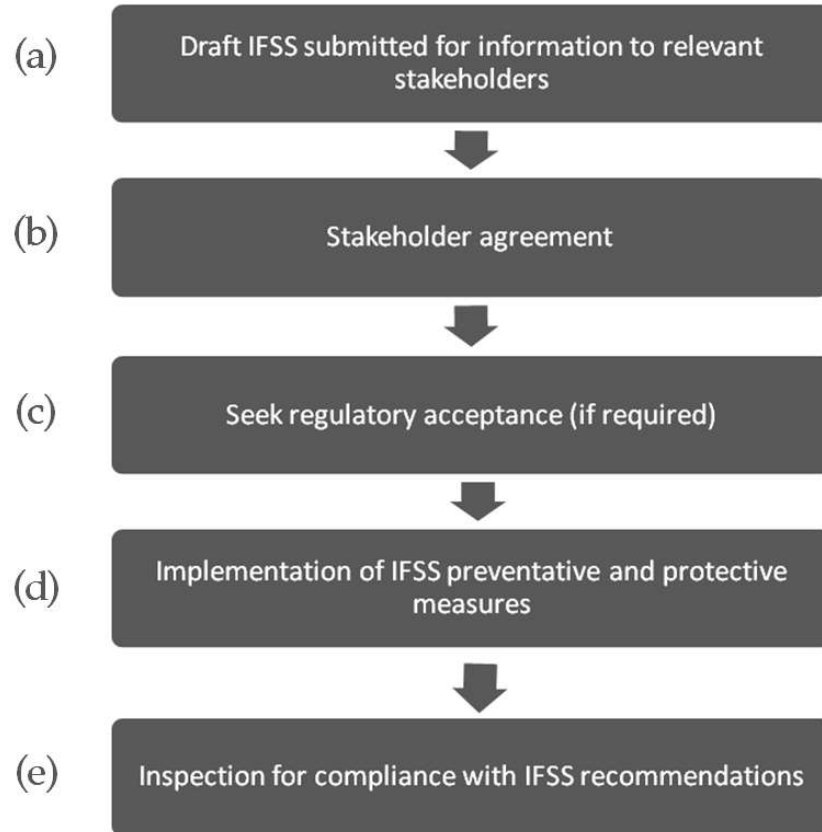
Persons responsible for the formulation of the strategy are encouraged to utilise the information contained in Appendix A – Fire Safety Considerations, or other benchmarking tools provided in Section 5. Annexure A is based loosely upon NFPA 241 – Standard for Safe Guarding Construction, Alteration and Demolition Operations.

To the maximum degree practicable, the IFSS is to be underpinned by verification such as test data, calculations, fire and smoke modelling, hazard frequency and consequence analysis (among others) to demonstrate achievement of the agreed acceptance criteria/criterion.

The following sub-points correspond to the steps in the figure above:

- (a) Is an outflow of the preceding Step 1 (process (f) relating to agreed fire safety objectives (Acceptance Criteria)):
- (b) Assessment establishes the existing level of fire safety to the occupied, non-construction parts of the building;
- (c) These are suggested fire safety considerations, however the IFSS is not limited to these considerations;
- (d) This process assesses the potential impact of the construction on the assessed pre-construction levels of fire safety;
- (e) An intrinsic step of the IFSS to address the stated fire safety objectives; and
- (f) This is the outcome of the assessment from (a) to (e).

4.4. Step 3: Implementation of the IFSS



Step 3 for the more complex IFSS, and subject to stakeholder agreement, may warrant some degree of involvement of the authority/s having jurisdiction (AHJ) and/or Fire Brigades prior to implementation of the IFSS between the occupied zone and the construction zone.

This could extend to a referral for their information and/or comment as appropriate to the circumstances. It should be noted that there is presently no legislative obligation for AHJs or the Fire Brigades to have an IFSS referred for information and/or comment.

Where the regulatory authority(s) choose to comment, the AHJ may not agree with the outcomes of the IFSS, in which case proponents of the IFSS may be required to go back a step and repeat step 2 for the purposes of gaining acceptance of all key stakeholders in step 3.

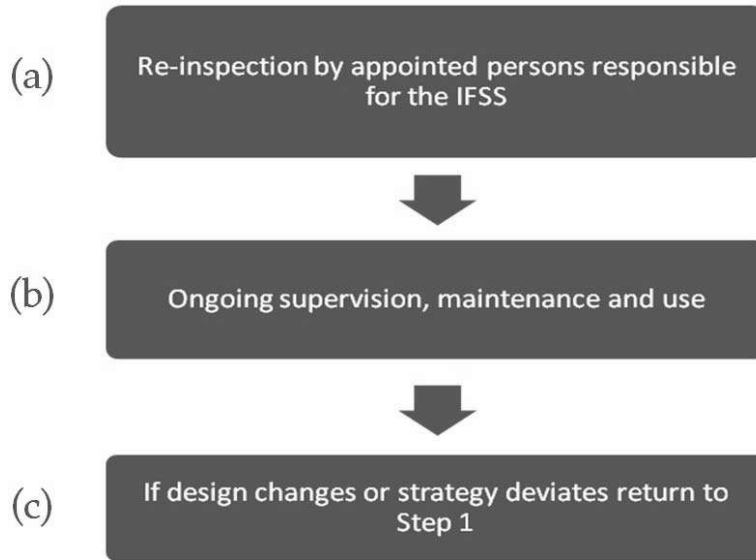
It is important that the implementation of the IFSS be governed by the writers of the strategy to mitigate the opportunity for ambiguity in its implementation. This also provides for a more robust process similar to that of an interim occupation certificate process.

The following sub-points correspond to the steps in the figure above:

- (a) Dependent upon the degree of risk identified as minor or significant, some stakeholders will simply need to be informed by way of a report for their record and/or others may need to be interactive participants within the design review process;
- (b) As above;
- (c) The degree of complexity of the IFSS and/or the urgency of the IFSS should be the determining factors with respect to the need for regulatory involvement. This could extend to a referral for their information and/or comment as appropriate to the circumstances;

- (d) This may be done relatively quickly on site in the event of a minor identified risk or for more complex issues it may take several days/weeks to implement the IFSS on site. Person appointed on site for day to day responsibility for implementation and day to day review; and
- (e) This process is recommended for both minor and significant issues and/or hazards identified on site.

4.5. Step 4: Monitor and Review (Ongoing)



Step 4 is relatively straight forward. The IFSS should be managed and part of that management should be that as construction proceeds, the measures chosen to protect occupants should be maintained.

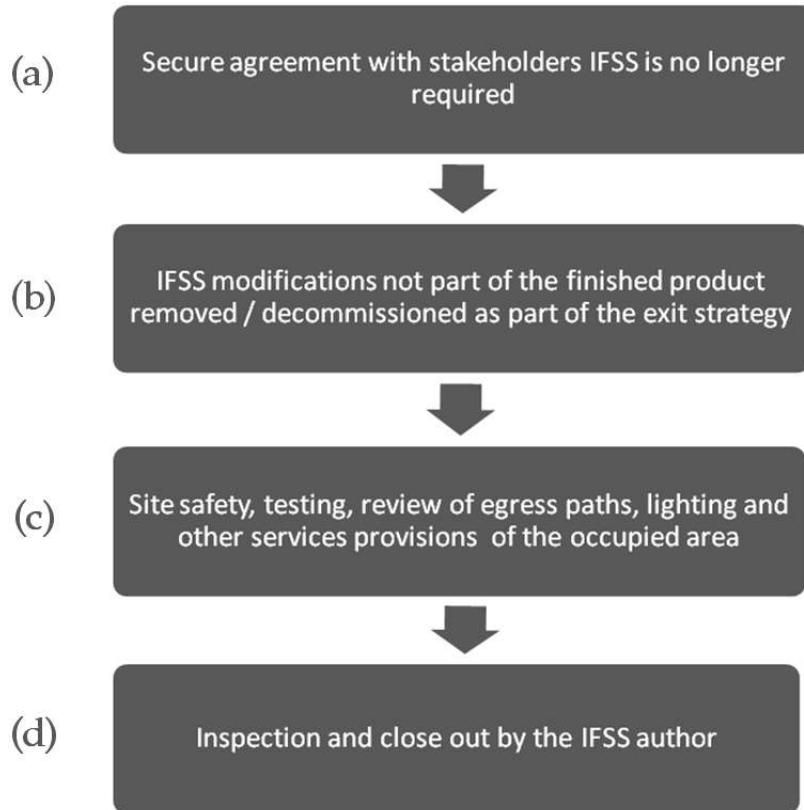
Responsibility needs to be delegated to ensure the IFSS remains consistent over time and where appropriate, maintenance is undertaken.

Should circumstances change, a review of the strategy may be needed. If the strategy is at risk of becoming heavily modified or void, the cycle through steps 1 to 4 may need to be repeated.

The following sub-points correspond to the steps in the figure above:

- (a) Circumstances may change due to operational needs which may impact on the IFSS;
- (b) On-going supervision on site by appointed person or person's familiar with the IFSS; and
- (c) Appointed person or persons on site to instigate remedial action or notify the author of the IFSS.

4.6. Step 5: Close Out and Decommissioning



This represents the final step in the IFSS. For example, when the construction works have been completed for a tenancy and there is no longer a need to maintain separation between areas, or two zones are to be amalgamated into a single occupancy.

The step involves de-constructing barriers and making good, as well as inspecting, testing and commissioning of paths of travel and active and passive fire safety measures that are to be part of the completed building.

The last phase of the IFSS process should be closed out by the IFSS author who should report to the IFSS stakeholders that works have been completed satisfactorily.

The following sub-points correspond to the steps in the figure above:

- (a) An IFSS by its very nature is a finite strategy over an agreed period of time;
- (b) This is in the best interests of all stakeholders due to Occupational Health and Safety (OH&S) considerations;
- (c) As above; and
- (d) As above, also to extend the strategy beyond the requisite period is not recommended due to unnecessary exposure to risk on the part of the author.

5. Suggested Acceptance Criteria

- (a) One should look to existing legislation for the agreed Acceptance Criteria. For example, Clause 143 of the EP&A Regulation “*the fire protection and structural capacity of the building will not be reduced.*”

If this is not practical, then perhaps modify the wording and seek agreement on *the fire protection and structural capacity of the building will not be unduly reduced*, Note: unduly is defined by The Oxford Dictionary and Google Wiktionary as fire protection not reduced beyond what is proper, appropriate, warranted or justified.

Such an approach should be verified by risk mitigation strategies and recognised methodologies such as AS/NZS ISO 31000:2009 to leverage in “offsets” such as to make the occupied building or part thereof adequately safe.

- (b) If this is not practical then seek guidance from the Fire Engineering Guidelines at Section 0.2.3.1 which makes reference to BCA Performance Requirements and states;
“*The BCA performance requirements provide the means by which fires in buildings may be managed to an acceptable degree.*”

This may be adapted to;

“*The IFSS provides the means by which fires in buildings may be managed to an acceptable degree.*”

Sensible and achievable acceptance criteria/criterion that provides a fundamental and acceptable level of fire safety is what must underpin this process. It is recognised that there are varying levels of knowledge on installation and performance of fire safety systems and services. Workshops may be needed to identify and affirm the requirements of a construction IFSS.

Any building works that potentially impact on the existing fire protection level of an occupied part of a building warrant notification to the building occupants, the building owner and the building insurer.

5.1. Suggested Means By Which to “Benchmark” Achievement of the Agreed Acceptance Criteria

In some circumstances it may be appropriate to use one or a combination of the following:

5.1.1. BCA Performance Requirements

Assess suitability for existing buildings that interface or integrate with new building works.

5.1.2. NFPA 241

This standard can be used for both new and existing buildings and provides a checklist type assessment methodology and requirements relating to (but not limited to):

separation distances of temporary offices and sheds, equipment, hot work, fire watch (warden), welding, storage and handling of flammable and combustible materials, electrical wiring, lighting, pre-fire plans, site security, access for fire fighters, access roads, stairs, water supplies, separation walls, scaffolding materials, means of egress, hydrant and standpipes, PPE, evacuation procedures, fire communication systems, hazardous operations and procedures.

Generally this standard is a useful means by which to benchmark achievement of the acceptance criteria.

5.1.3. International Fire Engineering Guidelines Fire Safety Sub-Systems A-F

- (i) SS-A Fire Initiation & Development & Control
- (ii) SS-B Smoke Development & Spread & Control
- (iii) SS-C Fire Spread & Development & Control
- (iv) SS-D Fire Detection Warning & Suppression
- (v) SS-E Occupant Evacuation & Control
- (vi) SS-F Fire Services Intervention

Use of the International Fire Engineering Guidelines as a means of benchmarking is recommended by specialist practitioners such as fire engineers.

5.1.4. Fire Safety Study Guidelines Hazard Industry Planning Advisory Paper No.2

This paper provides a risk based methodology in a table format for identifying hazards and detection, protection and preventive measures that can be implemented to mitigate the risk and thus a means to benchmark achievement of the agreed acceptance criteria.

5.1.5. AS/NZ ISO 31000:2009 Risk Management Principles and Guidelines

This standard embodies a five step risk management framework which incorporates the same risk management process from its predecessor, being AS/NZS 4360:1999.

The FSE 11 International Conference Paper presented by Dr Amer Magrabi astutely adapts the above five step risk management framework (and process) to the Fire Engineering Guidelines. The flow chart provided in his presentation is attached as Annexure B and is recommended for an IFSS risk based approach as adequate verification to leverage in fire protection offsets to make an occupied part of a building adequately safe during construction.

As with Item 5.1.3, use of the International Fire Engineering Guidelines within the ISO 31000 framework as a means of benchmarking achievement of the acceptance criteria is recommended by specialist practitioners such as fire engineers.

5.1.6. IPENZ Practice Note 7 “Design for Safety of Buildings and Older Structures”

This standard can be used for both new and existing buildings for both permanent works and temporary works and provides a checklist type assessment methodology and requirements relating to (but not limited to):

installation of temporary fire alerting, detection, site communication and fire protection systems during construction, temporary evacuation procedures and signage, temporary emergency lighting and unfettered egress to an adequate number of exits free of locks, appropriate fire resistance for escape routes and to suit temporary fire loads, control of fire spread and temporary fire suppression among other things.

This PN is also a useful means by which to benchmark achievement of the acceptance criteria.

5.1.7. FM Global Property Loss Prevention Data Sheets

This standard can be used for both new and existing buildings for both permanent works and temporary works and provides a checklist type assessment methodology and requirements relating to (but not limited to):

Disposal of rubbish, hot work, construction sheds, equipment storage, material storage and use, temporary heaters, temporary hose reels and extinguishers, fire watch service, flammable liquids handling, and smoking restrictions among other things.

Overall, these methods of benchmarking can be used to assess the current pre-construction level of fire safety of the occupied areas and also the likely impact/hazard represented by the construction areas that integrate or interface with occupied areas.

These suggested heads of consideration can be adapted to local codes and standards as indicated herein and may be used as the basis for design and/or assessment of an IFSS for existing occupied buildings to achieve the agreed acceptance criteria.

6. IFSS Outcomes

- a) An IFSS that provides a coherent and agreed plan of managing fire and life safety for occupants during construction, or staging of construction, that interfaces with, or integrates with, existing occupied buildings;
- b) To minimise the likelihood and the consequence of a fire occurring during the transitional levels of fire safety of partially occupied buildings (new or existing) undergoing construction;
- c) An IFSS that facilitates the provision of adequate fire safety for occupants to at least satisfy minimum regulatory obligations, for example OH&S to building owners and lessees;
- d) Enables the client to avoid installing expensive fire safety systems that will have a low cost benefit ratio over the duration of interim building works;
- e) Aids in obtaining an Interim Occupation Certificate or other regulatory approval, in the most timely and cost effective way possible; and
- f) An IFSS that is consistent with this PN provides a uniform approach to such things as agreed objectives, outcomes and guidance in preparing and implementing an IFSS.

7. Fire Safety Considerations

A summary of Fire Safety Considerations (guiding principles) is attached at Appendix A.

8. Conclusion

There is an OH&S requirement to ensure that employees and non-employees legally entitled to be within a workplace must be provided with an acceptable level of safety in the workplace at all times.

Adherence to the principles and methodologies of this PN will provide a means by which a consistent approach can be achieved in the design, assessment and implementation of an IFSS for new or existing buildings that either interface, or integrate, with building works.

The SFS PN may of itself serve as an interim fire safety tool pending a review of prevailing legislation and possible amendments to legislation to negate or supplement this PN.

9. Further Reading

- (i) Building Code of Australia (current version or as amended)
- (ii) Environmental Planning and Assessment Act (current version or as amended)
- (iii) Environmental Planning and Assessment Regulation (current version or as amended)

- (iv) Occupational Health and Safety Act (current version or as amended)
- (v) Occupational Health and Safety Regulation (current version or as amended)
- (vi) National Fire Protection Association 241 (current version or as amended)
- (vii) International Fire Engineering Guidelines (current version or as amended)
- (viii) FSE 11 International Conference “Raising the Bar” Sydney Australia 23-24 March 2011
“Fire safety In Partially Occupied Buildings What is Reasonable? What is Acceptable?
Are We Doing Enough?”
- (ix) FM Global Property Loss Prevention Data Sheets January 2006
- (x) IPENZ Practice Note 07 “Design For Safety in Buildings and Other Structures”
- (xi) AS/NZS ISO 31000:2009 – Risk Management Principles and Guidelines

Appendix A. Fire Safety Considerations

The function of this Appendix is to provide a series of fire safety considerations – triggers – which may need to be taken into consideration in the development of an interim fire safety strategy in accordance with the PN. These triggers are loosely based on NFPA 241 – Standard for Safe Guarding Construction, Alteration and Demolition Operations, as well as fire safety considerations as determined by BCA compliance.

This list is not finite, but purposeful in stimulating review towards the development of an agreed IFSS whilst construction and occupation co-exist.

Building and occupancy characteristics

- a. Existing passive fire safety features (fire rated walls etc)
- b. Existing active fire safety features (sprinklers, smoke detection, mechanical exhaust etc)
- c. Principal occupant characteristics for the occupied zone during construction

Egress and wayfinding (occupied zone)

- a. Exit signs and emergency lighting at the interface between zones (i.e. is clear wayfinding available?)
- b. Stair and exit availability
- c. Any special staging considerations or impact on current fire engineered solutions
- d. Consideration of fire separation of temporary exits through construction zones
- e. Is it appropriate to consider travel distance and exits from the occupied zone through the construction zone for life safety?

Compartmentation and separation (occupied zone from construction zone)

- a. Consider the extent of storage / combustibles in the construction zone adjacent the occupied zone
- b. The impact of any demolition works
- c. Consider temporary passive fire separation during this phase
- d. Consider active services required during this phase

Management procedures (fire protection)

- a. Pre-fire planning (staging of handovers etc)
- b. Understand and consider the essential fire safety measures available and their adequacy (i.e. AFSS)
- c. Fire watch for temporary isolation of services
- d. Review of emergency procedures for all building occupants
- e. Housekeeping
- f. Communication

- g. Signage and / or manual or automated alarms
- h. Consider option of third party oversight and/or review on a periodic basis to ensure on-going compliance

Emergency access and fire fighter intervention (both zones)

- a. Vehicular access in and out not be to obstructed
- b. Is temporary signage necessary and where?
- c. Position of boosters, pumps fire control and any on site obstructions (temp fencing, storage etc)
- d. Temporary and permanent fire services (in the building) and availability for fire fighters
- e. Water supply
- f. Consider local brigade invitation for advice and review of temporary measures

Processes and hazards

- a. Hot works required?
- b. Use of power tools / electrical / fuel based combustion equipment adjacent the occupied zone
- c. Temporary electrical / lighting / power
- d. Storage and combustibility of materials
- e. Demolition of materials and removal of fire any fire rated protective materials
- f. Consideration of temporary facilities (site sheds, processes etc)
- g. Altered fire loads and any services that will be isolated during construction works.

Appendix B. AS/NZ ISO 31000 Framework and Process Modified for an IFSS Framework and Process

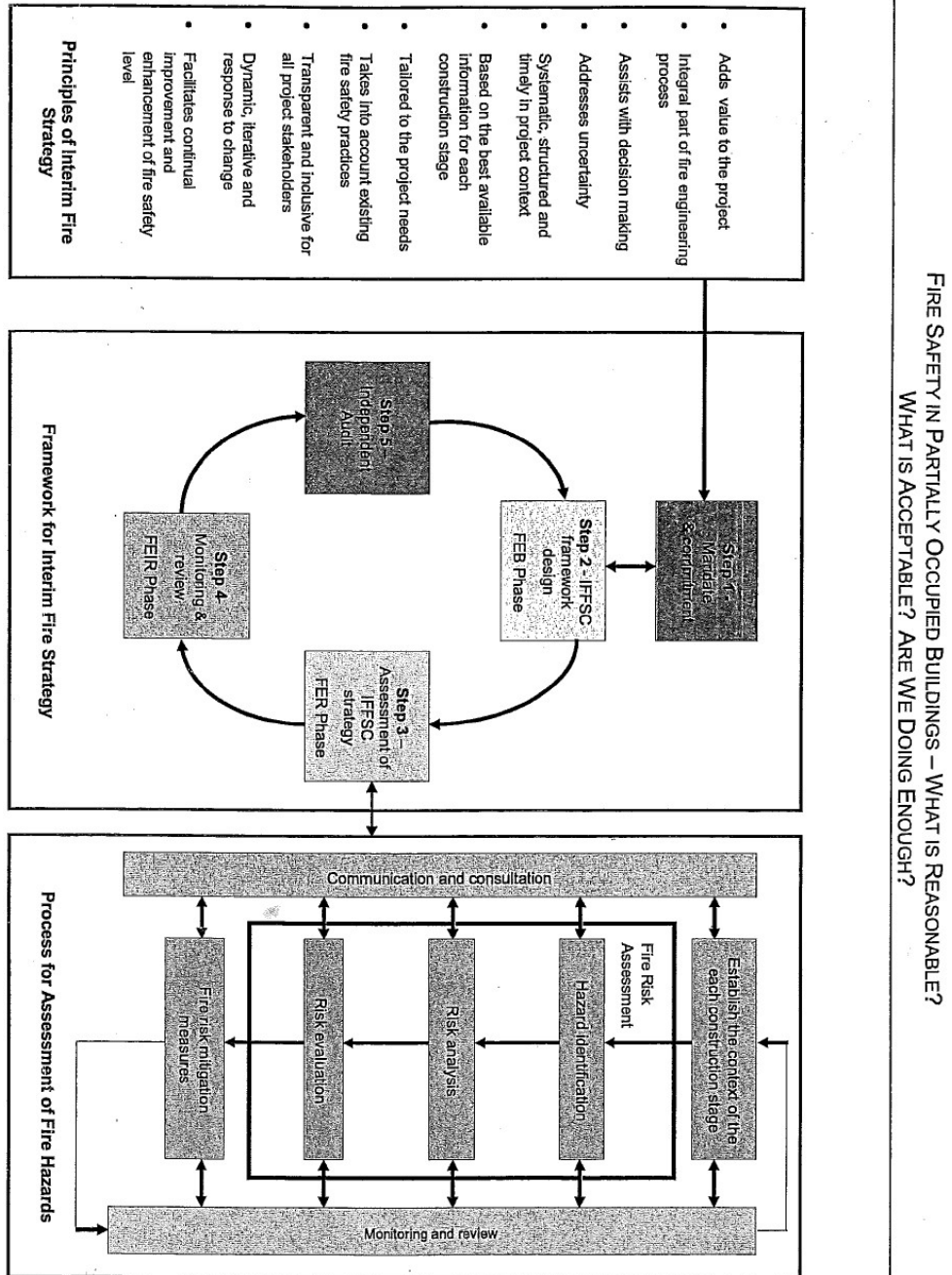


Figure 1 – The principles, framework and processes for the development and implementation of an Interim Fire Safety Strategy during Construction (IFSSC).

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