



New Zealand Fire Service S47 Advice

October 2009

**An independent review of the New Zealand
Fire Service's role in providing advice to
building consent authorities under section
47 of the Building Act 2004**

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Preface

This report has been prepared for the New Zealand Fire Service Commission by Michael Mills from MartinJenkins (Martin, Jenkins & Associates Limited).

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MartinJenkins was established in 1993, and is privately owned and directed by Doug Martin, Kevin Jenkins, Michael Mills and Nick Davis.

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Background

The Building Act 2004 provides for building consent authorities (BCAs) to refer building consent applications of the types specified in a New Zealand Gazette notice to the New Zealand Fire Service Commission (NZFS) for its advice on:

- provisions for means of escape from fire
- the needs of persons who are authorised by law to enter the building to undertake fire fighting.

To provide this advice the NZFS established the Design Review Unit (DRU) which is attached to its national office and located in Auckland. The DRU receives building consent applications from all BCAs, reviews these applications and provides advice back to BCAs.

On 1 July 2009 Carol Caldwell and eleven other fire engineers wrote to the Chair of the New Zealand Fire Service Commission. In their letter they requested a meeting with the Commission to discuss issues that they have with the processes and procedures adopted by the DRU. Specific issues noted in their letter were:

- the need for a NZFS representative at Fire Engineering Brief stakeholder meeting to be able to represent what the DRU will accept
- DRU not substantiating their technical comments or not providing references that are in the public domain
- DRU not contacting the fire engineer of record to discuss the project
- DRU accepting repetitive submittals from Council on the same project with minimal changes in design
- That DRU does not recognise the equivalent to prescriptive approach and recommends that designs using a mixture of approaches be rejected
- That the quality of advice provided in some of the DRU 'Advice Memos' indicates a lack of knowledge which is necessary to provide appropriate technical reviews.

In response to this letter the Chair decided to seek further advice on whether the DRU is properly discharging the statutory functions imposed on it by the Building Act.

To that end the NZFS engaged MartinJenkins to undertake an independent review of the NZFS' approach to providing section 47 advice to BCAs. A particular consideration for this review is whether the approach taken by the NZFS meets the policy intent that underpins section 47 of the Building Act. The NZFS has separately engaged persons to undertake technical audits of the quality of the advice provided by the NZFS.

Approach

Our approach to the review involved:

- familiarising ourselves with the relevant provisions of the Building Act, the Fire Services Act, relevant regulations, compliance documents and the Gazette notice made under the Building Act
- familiarising ourselves with the policy context that resulted in decisions to include section 47 in the Building Act. To gain this understanding we met with officials from Department of Building and Housing (DBH), read available official documents and guidelines and other commentaries, and familiarised ourselves with the detail of several legal cases that involved disputes over the fire safety code compliance of buildings and alterations completed prior to 2004
- familiarising ourselves with the approach taken by the NZFS to providing advice to BCAs on the building consents that they refer to it under section 46 of the Building Act. This included our reviewing documentation provided to us by the NZFS and meeting with the Engineering Manager who manages the DRU
- familiarising ourselves with the contents and conclusions of two technical audits of the DRU's advice
- reviewing correspondence between Carol Caldwell et al and the Chair of the New Zealand Fire Service Commission
- meeting with Carol Caldwell and others to clarify their issues and concerns
- reading a number of memoranda provided to us by fire engineers containing advice from the DRU to various BCAs on building consents referred to it under section 46 of the Building Act
- meeting with representatives of Auckland City Council to discuss how the relationship between the NZFS and BCAs works in practice
- drafting a report of our findings.

Our review is not a technical review or audit of the DRU's advice. Others have been engaged by the NZFS to do this.

We would like to take this opportunity to thank all of the people who took the time to meet with us and contribute to our understanding of the role played by the NZFS. The findings and conclusions of this report, however, are ours alone.

Context

Statutory requirements

In their design, construction and operation of buildings, owners must meet statutory requirements related to fire safety including:

Before construction commences

- an owner must apply to a BCA for a building consent. To be granted a building consent an owner must demonstrate in their application how the proposed building work will meet the performance requirements of the New Zealand Building Code. These include the following requirements related to fire safety:
 - Clause C1 - outbreak of fire – to safeguard people from injury or illness caused by fire. The functional requirement of the Code is that fixed appliances using the controlled combustion of solid, liquid or gaseous fuel, shall be installed in a way which reduces the likelihood of fire.
 - Clause C2 - means of escape – to safeguard people from injury or illness from a fire while escaping to a safe place; and facilitate fire rescue operations. The functional requirement of the Code is that buildings shall be provided with means of escape from fire which: give people adequate time to reach a safe place without being overcome by the effects of fire; and give fire service personnel adequate time to undertake rescue operations.
 - Clause C3 - spread of fire – to safeguard people from injury or illness when evacuating a building during fire; provide protection to fire service personnel during fire fighting operations; protect adjacent household units, other residential units, and other property from the effects of fire; and safeguard the environment from adverse effects of fire. The functional requirement of the Code is that buildings shall be provided with safeguards against fire spread so that: occupants have time to escape to a safe place without being overcome by the effects of fire; fire-fighters may undertake rescue operations and protect property; adjacent household units, other residential units, and other property are protected from damage; and significant quantities of hazardous substances are not released to the environment during fire.
 - Clause C4 - structural stability during fire – to safeguard people from injury due to loss of structural stability during fire; and protect household units and other property from damage due to structural instability caused by fire. The functional requirement of the Code is that buildings shall be structured to maintain structural stability during fire to allow people adequate time to evacuate safely; allow fire service personnel adequate time to undertake rescue and fire fighting operations; and avoid collapse and consequential damage to adjacent household units or other property.

- Compliance with the above can be demonstrated by either following an acceptable solution provided for in a compliance document made by DBH or by an alternative 'design based' solution. For alternative solutions, the onus is on the applicant to demonstrate to the BCA in their consent application how their design will meet the performance requirements of the building code. One way of demonstrating compliance is to use a verification method provided by DBH (if one exists) which must be accepted by a BCA.

A BCA must grant a building consent if it is satisfied on reasonable grounds that the provisions of the building code would be met if the work were properly completed in accordance with the plans and specifications that accompany the application. For designs based on alternative solutions this requires a BCA to understand and decide whether or not (on the basis of information provided with the consent application) the design based solution will meet the performance requirements of the code.

On completion of building work

- an owner must apply to the same BCA that granted the building consent for a Code Compliance Certificate. The BCA must issue a Code Compliance Certificate if it is satisfied, on reasonable grounds that the building work complies with the building consent (amongst other requirements).
- One month after the issue of the Code Compliance Certificate the owner may need to apply to the NZFS for approval of an evacuation scheme. The requirements of evacuation schemes are set out in the Fire Safety and Evacuation of Building Regulations 2006 made under the provisions of the Fire Service Act 1975.

If the evacuation scheme is not approved, the National Commander must notify the applicant of the reasons for not approving the scheme and of the amendments that are required to the scheme. Amendments are not to include modifications to the building and must not require the building to meet performance criteria that exceed the requirements of the building code.

Sections 46, 47 and 48 of the Building Act

Sections 46, 47 and 48 of the Building Act provide for:

- BCAs to refer building consent applications for building types specified in a Gazette notice¹ to the NZFS. In short, these are consent applications for commercial and public buildings based on alternative solutions
- NZFS advice to BCAs on the following matters associated with these building consents:
 - provisions for means of escape from fire
 - needs of persons who are authorised by law to enter the building to undertake fire fighting.
- for the BCA to consider NZFS advice before deciding whether or not to grant a building consent.

In giving its advice the NZFS must not set out advice that provides for the building to meet performance criteria that exceed the requirements of the building code.

These provisions were included in the Building Act to provide a practical means for the NZFS to give 'front end' advice to BCAs on issues it might have with a proposed design that might impact on the ability of persons to escape from the building in the case of fire or for the NZFS to enter the building to undertake fire fighting duties and for BCAs to consider this advice before granting a building consent.

This was done to create better linkages between Building Act and Fire Service requirements so as to increase 'front end' certainty to building owners and reduce the likelihood of costly 'back end' disputes over fire safety requirements.

¹ These buildings are specified in a notice in the New Zealand Gazette, No. 56. They are buildings that that are based on alternative solutions or modifications to acceptable solutions or involve an alteration, change of use or subdivision of an existing building. They are buildings or parts of buildings used for 1 or more of the following purposes: (a) the gathering together, for any purpose, of 100 or more persons: (b) providing employment facilities for 10 or more persons: (c) providing accommodation for more than 5 persons (other than in 3 or fewer household units): (d) storing or processing hazardous substances in quantities exceeding the prescribed minimum amounts: (e) providing early childhood facilities (other than in a household unit): (f) providing nursing, medical, or geriatric care (other than in a household unit): (g) providing specialised care for persons with disabilities (other than in a household unit): (h) providing accommodation for persons under lawful detention (not being persons serving a sentence of home detention, or community detention, or serving a sentence of imprisonment on home detention, or on parole subject to residential restrictions imposed under section 15 of the Parole Act 2002). They do not include (a) Crown buildings, or class of Crown buildings, that is specified by the Minister by notice in the Gazette; or (b) premises of the mission (as defined in Schedule 1 of the Diplomatic Privileges and Immunities Act 1968).

Section 21A: substituted, on 1 October 2006, by section 8 of the Fire Service Amendment Act 2005 (2005 No 52).

Section 21A(1)(h): amended, on 1 October 2007, by section 58 of the Sentencing Amendment Act 2007 (2007 No 27).

Policy Rationale for section 47

Prior to enactment of the Building Act 2004 there were a number of high profile cases of the NZFS disputing territorial authority decisions to grant building consents and issue code compliance certificates.

One particular example concerned the change in use, from an office to a residential apartment, of a 10 story building located at 37-39 Federal Street in Auckland². The developer marketed and sold apartments in the building on the basis of advice from Auckland City Council that it would grant a building consent based on a particular design involving a single means of escape. A building consent was subsequently granted for this design and building work commenced. The NZFS subsequently sought a determination under the previous Building Act 1991 against Auckland City's granting the consent. The Building Industry Authority heard the determination and required some changes to the design³. This decision was subsequently appealed to the High Court by Auckland City. The process of dispute and appeal took in the order of two years to complete.

Delays and uncertainty created by disputes such as this resulted in costs to developers and others involved. Costs included those to developers of breaches of contractual conditions with purchasers and financiers, delays in the commissioning of buildings and lost revenue. To developers and other parties they also included legal costs. Decisions favouring NZFS interpretations sometimes required owners to make costly changes to their buildings prior to occupation. In other cases, deficient buildings were granted waivers from building code requirements in order to allow them to operate without costly changes.

NZFS Design Review Unit

The DRU was established by the Commission specifically to provide advice to BCAs on consents referred to it under section 46 of the Building Act.

The DRU has been operating since 2005. It is attached to the National Office and is located in Auckland. It employs a mix of qualified and near qualified fire engineers. It operates on a cost recovery basis and recovers the cost of its advice to BCAs at the rate of \$175 / hour.

Around 700 building consent applications are referred to the DRU each year by BCAs. The Building Act gives the NZFS ten days to provide advice on each consent.

Of all of the consents referred to the DRU each year the DRU finds deficiencies with the majority. Its manager reported that of the around 700 consents reviewed over the past year about:

- 25% were found to have insufficient documentation at the initial review stage

² High Court Judgment of Gallen J., in the matter of Determination No.93/0004 by the Building Industry Authority between Auckland City Council and The New Zealand Fire Service and Symphony Group Limited

³ Building Industry Authority Determination No.93/0004 refers

- of what remained, only around 10% were found to be adequate.

Some of the underlying reasons for why the DRU finds so many deficiencies are discussed later in this report.

Findings

We conclude that the operation of the DRU and the nature of advice tendered by it are consistent with the provisions of the Building Act 2004.

We also conclude that despite the implementation of section 47 there continues to be uncertainty for building consent applicants as to what is required to meet the means of escape and fire fighting requirements of the Building Code.

We report our findings in terms of:

- the consistency of NZFS advice to BCAs with Building Act requirements
- the consistency of advice provided by different parts of the NZFS at different stages in the building design and consent process
- the broader regulatory context in which the NZFS provides its advice.

Consistency of DRU advice with section 47 requirements

Apart from the ten day timeframe, the requirement that the advice must be on matters related to means of escape and fire fighter needs, and the requirement that the advice not exceed the requirements of the New Zealand Building Code, the Building Act does not prescribe how the NZFS should provide its advice.

The process followed by the DRU involves:

- specified consents being referred to the DRU
- an initial review of each consent by the DRU to determine its completeness and the amount of work required to fully review it. Consents are divided between large, medium and small consents. In cases of consents with insufficient information, further information is requested from the BCA before consents are further processed.
- full technical review of each complete consent by DRU engineer on the basis of a standardised check sheet
- preparation by the engineer of a standardised memo detailing NZFS' advice in respect of:
 - means of escape
 - fire fighting needs.
- review and sign off of the memo by either the Engineering Manager or a senior fire engineer
- forwarding of the memo and an accompanying invoice to the BCA.

This approach is consistent with the approach provided for by section 47 of the Building Act.

Specific issues raised by fire engineers

Fire engineers spoken to in the course of the review raised a number of concerns with how the DRU goes about providing its advice.

DRU not contacting the fire engineer of record to discuss the project

Fire engineers expressed frustration that the DRU refuses to discuss the detail of specific building consent applications with the fire engineer of record. We were told that this leads to undue delay and cost for consent applicants. We were told of instances where a phone call from the DRU to the fire engineer of record might have resolved a simple misunderstanding or provided a simple means of correcting an omission or error in a consent application.

We conclude, however that:

- it would be inappropriate for the DRU to engage directly with a consent applicant or the applicant's professional advisors. This is because:
 - from a statutory perspective, the DRU's relationship is with the BCA, not the consent applicant
 - the role of the NZFS is to provide advice to the BCA
 - the relationship with the consent applicant is the BCA's. It is the BCA's statutory role to accept consent applications, to seek and consider advice from the NZFS, to decide whether or not to act on the NZFS' advice (and how), to make a decision on whether or not to grant the consent application and to notify the consent applicant of its decision.
- to the extent that discussion is required to clarify issues with the consent application we would expect this to be between the NZFS and the BCA, and the BCA and the consent applicant
- consent applications should be self contained and provide all of the information needed to support the application. DRU concerns with the quality of building consent applications are discussed later in this report.

DRU accepting repetitive submittals from Council on the same project with minimal changes in design

Related to the above concern we were told that the advice provided by the NZFS to a BCA is frequently forwarded by the BCA to the building consent applicant for response, and the applicants response subsequently forwarded by the BCA back to the NZFS for further advice. We were told that this process can continue for several iterations. Both fire engineers and the DRU expressed concerns with this.

We agree that this approach is bureaucratic, potentially frustrating to applicants, and administratively costly.

We were told of several reasons for why it is occurring:

- some BCAs take an iterative approach to processing consent applications
- some BCAs have little or limited in house capability to make decisions on the building code compliance of alternative solutions for fire design. Whereas larger BCAs may engage a consultant to provide specialist advice on these consents smaller BCAs may instead rely on NZFU advice
- BCAs are risk averse. We were told that the experience of leaky buildings has resulted in BCAs being concerned with legal liability for consenting decisions, and as a result some are reluctant to grant consent applications in the face of outstanding NZFS concerns.

All of these reasons appear to be contributing to an environment where BCAs appear unable or unwilling to make decisions on consent applications involving alternative solutions and instead are looking to the DRU and the consent applicant to reconcile differences of interpretation. This is not, however, the NZFS' role.

DRU not substantiating technical comments or providing references that are in the public domain; and that the quality of advice provided in some of the DRU 'Advice Memos' indicates a lack of knowledge which is necessary to provide appropriate technical reviews

Fire engineers said that the DRU should be more transparent in its advice and should substantiate the basis and rationale for its advice. They also expressed some concern with the experience of some DRU staff and commented that some have insufficient experience of the New Zealand building code and environment.

We were presented with anecdotes from both the DRU and fire engineers of differences of interpretation of building code requirements, disagreement on the input parameters required to assess alternative solutions for code compliance and disagreements on the amount of risk tolerance that should be allowed. Some reasons for these disagreements and differences in judgment are discussed later in this report.

It is beyond the scope of this review to comment on the technical accuracy of the DRU's advice or competence of its staff. We do note, however, that:

- the DRU's process provides for its advice to be reviewed by a senior engineer before it is signed out to a BCA
- the operations of the DRU undergo periodic technical audit. Two audits were undertaken in 2006 and a further two audits are currently underway. The 2006 audits involved technical review by Australian fire engineers of a sample of the advice provided by the DRU to

BCAs. The findings of the 2006 audits generally endorsed the technical quality of the DRU's advice. The conclusions of one audit included "that the DRU is effectively fulfilling their obligations under the Building Act Section 47 taking into account the quality and detail of the submissions". The conclusions of the other audit included that "the DRU appears to competently assess and advise on building consent applications as required by law and regulations".

- Concerns expressed by the DRU's manager with the quality of building consents received by the DRU are supported by the findings of the 2006 audits. Both were critical of the quality of consent applications provided to the DRU with conclusions such as "the quality of submissions to the review is generally poor", and that "the technical quality of memorandums is generally better than the quality of the fire engineering submissions".

We also note that the statutory obligation to make a regulatory decision is the BCAs, not the DRU's. As such it is the BCAs duty to assess the building consent application, to consider the NZFS' advice and to decide, on reasonable grounds, whether or not to grant the building consent. In doing so, we would expect the BCA to consider the robustness of the NZFS' advice and to raise any issues with the quality of its advice directly with the DRU.

Role clarification

We conclude that some of the concerns raised by fire engineers' result from a misunderstanding of the role of the NZFS in advising on building consents referred to it by BCAs. In order to address this we recommend that the NZFS take steps to clarify its role to both BCAs and consent applicants.

The provisions of the Building Act seem clear that the NZFS' role is to provide advice to BCAs rather than make regulatory decisions.

The Building Act is also clear that NZFS can choose whether or not to provide this advice.

In performing this advisory role the NZFS' relationship is to the BCA, not the building consent applicant.

We heard sufficient comment from engineers, NZFS and DBH personnel to lead us to believe that some BCAs may unduly rely on the DRU to review consents for compliance with the fire safety clauses of the building code. This is an issue, because this is not the NZFS' statutory role. Instead, we would expect NZFS advice to BCAs to focus on particular issues and concerns that it has with particular consent applications from the perspective of its statutory role and its operational requirements.

To the extent that BCAs rely on DRU advice as a substitute for their own review and peer review of consent applications this needs to be addressed by DBH and BCAs.

In our review of materials describing the role of the DRU and our discussions with NZFS, BCA, DBH and fire engineering personnel we identified the following additional issues concerning perceptions of NZFS' section 47 role:

- NZFS describes its role as regulatory – we believe that it would be more accurate to describe its role as advisory within a statutory context – certain consents must be referred to the NZFS, the NZFS can advise on them and a BCA must consider its advice
- fire engineers consider the NZFS role to be akin to a peer review role. We do not accept this interpretation. The role of the NZFS is to give advice to BCAs on issues that it has with certain building consent applications so that there is an opportunity for these issues to be considered and addressed prior to BCAs granting building consents. This is not a peer review role. If peer review is required we believe it should most appropriately be sourced at the design stage by the consent applicant or at the consenting stage by the BCA.

NZFS design input

Fire engineers told us that they value front end input from the NZFS to fire engineering briefs and designs. They also told us that they want a clear view from the NZFS on what it requires for fire fighting purposes. They told us that they are not getting this.

In addition to the NZFS' section 47 role, NZFS seeks to provide advice at several points in the design and consenting process. A useful overview of this advice is described in the NZFS brochure 'Life of a Building'. In summary, NZFS seeks to provide advice:

- **Prior to an owner applying for a building consent** - NZFS seeks to be consulted in the development of a pre design 'Fire Engineering Brief'. In its written materials NZFS states that "the Fire Engineering Brief should contain the agreed parameters of the design and include such aspects as: scope of project, principle building attributes, dominant occupant characteristics, performance requirements, methods of analysis, acceptance criteria, standards for construction, commissioning management and maintenance". Similar consultation with the NZFS is also recommended in the International Fire Engineering Guidelines published by the Department of Building and Housing.
- **During the detailed design stage** - NZFS seeks to be consulted on "the location of fire safety systems within the building and Fire Service Access". In its published materials the NZFS states that "...the technical fire safety officer can bring a wealth of knowledge to this part of the process, particularly with regard to knowledge of the various codes and standards. As with the Fire Engineering Brief (FEB) process, it is critical that Fire Service staff are involved in discussions about fire fighting facilities with the designer".

In our discussions with fire engineers, DRU and BCA personnel we were told that the advice provided by fire safety personnel and the DRU is sometimes inconsistent. We were told, for instance, of examples of designs being based on advice from fire safety personnel that were later criticised in DRU advice.

While we are unable to form a definitive view on whether or not there really are disparities in the advice provided by the NZFS at different points in the design and consenting process, we believe that there is sufficient cause to further explore this issue and that there is clearly a widespread view amongst fire engineers that there are disparities. We also note that there may be risk to the NZFS that advice could currently be sourced by consent applicants and their advisors from, and provided by, NZFS personnel without the necessary skills or technical knowledge to provide it. We think it is critical that the NZFS take steps to ensure that:

- its advice at the pre design and design stages is consistent with its advice to BCAs
- NZFS advice is sought from and provided by appropriate personnel within the organisation.

For this reason we recommend that the NZFS consider the relationship between advice provided by regionally based fire safety personnel and the DRU and how to ensure that its advice is aligned and seen to be aligned.

Broader regulatory issues

New Zealand's building regulatory system is performance based. In theory:

- performance requirements for buildings are specified in the building code
- these requirements can either be demonstrated by a consent applicant by:
 - following an acceptable solution, which is one means of achieving the performance requirements that must be accepted by a BCA
 - an alternative, design based solution, which a BCA must determine, on reasonable grounds, whether or not it will meet the building code performance requirements.

Our discussions identified a number of issues with how the system works in practice:

Code requirements are open to interpretation

At the heart of concerns raised by fire engineers are what appear to be genuine differences of interpretation of building code requirements between building consent applicants and their advisors and the NZFS. Previous technical audits of the NZFS' advice have commented on the difficulty of the regulatory environment under which the DRU operates. In particular the difficulty of interpreting building code performance requirements and terms such as 'near as reasonably practical'. Both audits also commented on the need to improve guidance to designers on the documentation and technical information needed in building consent applications.

The reasons for this difficult environment appear to be that:

- the building code performance requirements are not well specified and are open to interpretation. We were told that (for example):

- the performance requirements include words such as a ‘near as practicable’, ‘adequate’ and ‘low probability’, which lend themselves to interpretation unless defined. The functional requirements of clause C2, for instance, require the means of escape to give people ‘adequate’ time to reach a safe place, and give the fire service ‘adequate’ time to undertake rescue operations
- that the input variables needed to interpret compliance, such as the amount of time needed for occupants to escape a building, the energy of a model fire, or the amount of time required for fire fighters to enter and search a building, are not specified in the building code

We were told that to the extent that there is specification of performance requirements and input variables, this currently occurs in particular compliance documents rather than the code. As a result compliance documents which were intended to provide one means of achieving code requirements have become benchmarks.

- there is ambiguity and differences of interpretation as to whether or not the performance requirements relate solely to the health and safety of occupants and fire fighters in rescuing occupants or also extend to fire fighting to protect property. Generally the performance requirements are specific to health and safety, but in clause c.3.3.10 (for instance) the performance requirements call for the fire safety systems installed to facilitate the specific needs of fire service personnel to both: carry out rescue operations, and control the spread of fire.

We were told by engineers, BCA officers and DBH personnel that the incentives on the NZFS are to be conservative in their interpretations of the building code and for designers to be liberal. This is because:

- the NZFS directly faces the risks of fire in its operations, but not the benefits of lower construction cost
- designers and their clients want to reduce construction costs.

To the extent that there is room for interpretation of code requirements, we would expect designers and the NZFU to come to different conclusions on what is required unless there is some practical means to resolve differences.

For this reason we think that means need to exist to clarify consistent differences in the interpretation of building code requirements, such as ventilation requirements.

To this end, officials from DBH described to us the following initiatives currently underway to improve the building code and its interpretation:

- the fire safety clauses of the building code are currently being reviewed. This includes work to better specify the performance requirements, to clarify the purpose of the code requirements re health and safety and property protection, and to specify key input parameters need to develop designs and to assess their compliance

- a subsequent review of related compliance documents
- the development of improved guidance materials to consent applicants, including checklists of what is required to support a consent application.

As described to us, the above initiatives have good potential to reduce scope for differences of interpretation in code requirements and to provide greater front end certainty to consent applicants.

Mechanisms for clarifying code requirements

We were told that apart from the DBH determination process, there is no forum or other mechanism for DBH, NZFS, BCAs and fire engineers to meet to resolve and clarify differences in their interpretations of code requirements. For this reason, the NZFS continues to seek determinations from DBH on important points of interpretation such as the code compliance of particular ventilating systems. When code requirements are unclear we think it is appropriate for the NZFS to seek clarification in this way.

The only alternative to this, we believe, is for the building regulator to be more proactive in providing guidance to achieve clarity where genuine differences in interpretation are identified to it by the NZFS, BCAs and other stakeholders.

Sector Capability

We were presented with evidence and anecdotes of poor quality consent applications and some poorly designed and built buildings. Evidence presented to us included:

- comments from the DRU manager to the effect that 25% of all consents referred to the DRU are accompanied by inadequate documentation
- the findings of two 2006 technical audits of DRU advice. Each raised concerns regarding the poor quality of consent applications forwarded to the DRU
- comments from some professional fire engineers (outside of the NZFS) to the effect that there are still 'cowboys' offering fire design input
- some specific examples of poorly designed and constructed buildings.

We were told that capability and skill deficits contribute to poor quality consent applications and decisions on them. While not all of the following are supported by all of the people we spoke to it seems likely to us that:

- there are issues with the skills and capability of some consultant designers, advisors and fire engineers
- there are unqualified and under-qualified persons presenting themselves as advisors and consultants

- many BCAs do not have people with the skills or capability necessary to decide on the code compliance of alternative fire engineering designs (or even those based on acceptable solutions) and instead rely on advice from the NZFS.

Skill deficits are a serious problem for the implementation of a performance based regulatory system. This is because performance based systems rely on skilled and capable people to develop design-based solutions, to solve difficult technical problems, and to interpret the compliance of design-based solutions with performance requirements. High levels of skill and capability are required of both designers and regulators. Without this skill and capability the system will likely produce poor outcomes or default to reliance on acceptable solutions.

Conclusions and recommendations

We conclude that the DRU is operating in a way consistent with the requirements of section 47 of the Building Act but that there continues to be: 'front end' uncertainty for building owners as to what is required to meet the fire safety requirements of the Building Code and some 'back end' end disputes and unanticipated costs of meeting fire safety requirements.

In order to address the issues raised in this review we conclude that the NZFS should:

- 1 Seek to clarify and clearly articulate to BCAs and consent applicants the nature of its section 47 advisory role.
- 2 Review, clarify and improve the organisational alignment between its various advisory roles including consideration of the consistency of advice provided by regional and DRU personnel. We propose that this include consideration of a model whereby:
 - The NZFS would provide advice on its requirements at the pre design and detailed design stages. In doing so it would ensure a robust and consistent approach to providing its advice consistent with building code and fire evacuation scheme requirements.
 - At the consent review phase, the NZFU would check whether:
 - It had been previously consulted
 - Advice on its requirements had been adequately addressed.
- 3 Ensure that its advice is robust, professional and to the point by:
 - a) Continuing current processes of technical audit
 - b) Reviewing its advice to ensure that its presentation, style and tone are consistent with its advisory role (having consideration to the environment in which its advice is being put).
- 4 Continue to work with the Department of Building and Housing to Clarify Building Code Requirements by:
 - a) Continuing to work with DBH to clarify building code requirements through review of code clauses, compliance documents and guidance materials
 - b) Working with DBH (and others as appropriate) to develop mechanisms for identifying and resolving current issues of interpretation other than through the determination process.
- 5 Continue to work with the Department of Building and Housing and BCAs to clarify Building consent application requirements by:

- a) Working with DBH, BCAs and others to ensure that there is clear and sufficient guidance on the information required to support building consent applications
 - b) Providing periodic feedback to each BCA on the quality and adequacy of consents provided to it for advice.
- 6 Work with IPENZ, DBH and other stakeholders to raise awareness of sector capability and skill constraints and develop strategies address skill gaps and build sector capability in support of quality fire engineering design