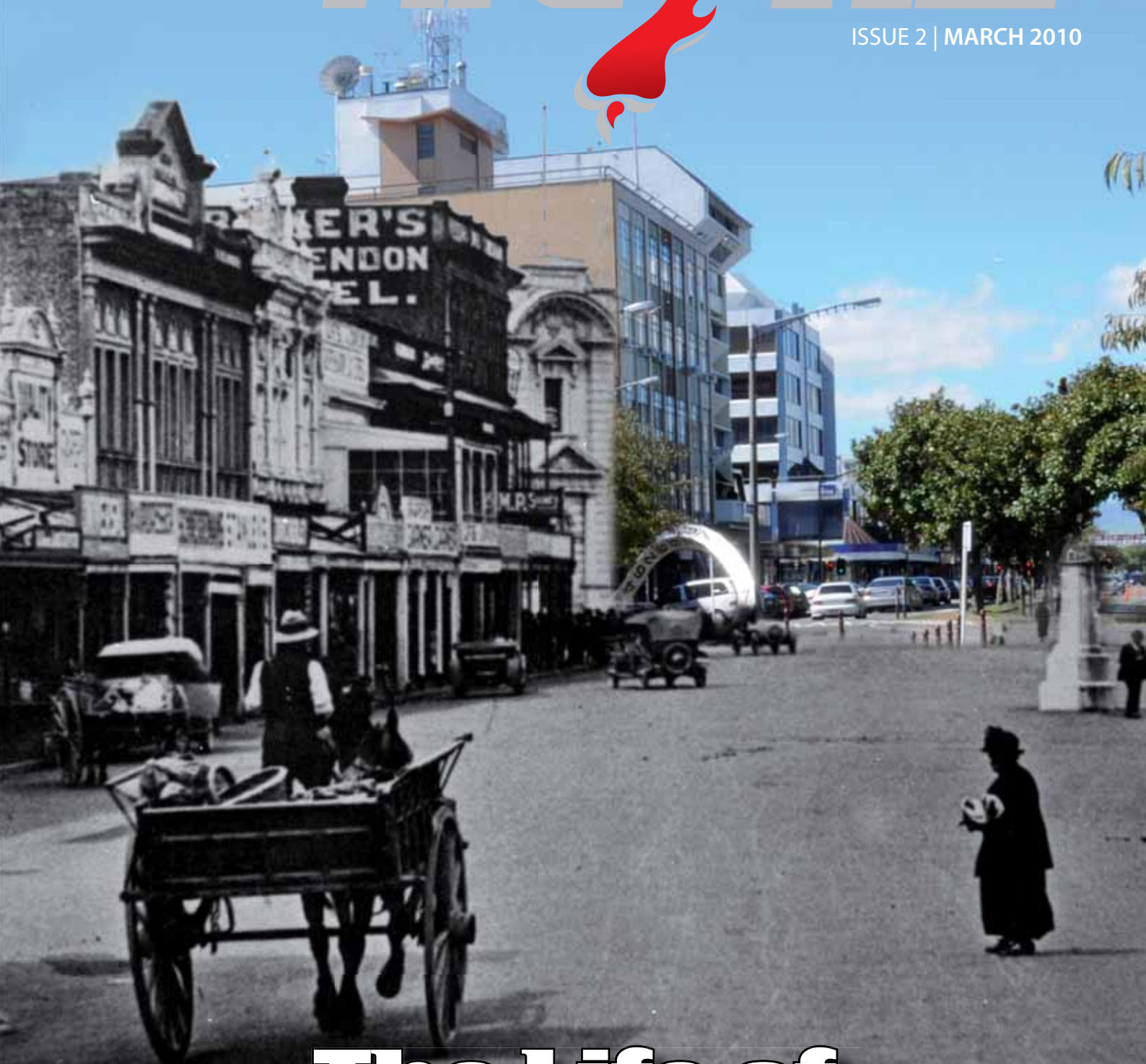


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Fire NZ

ISSUE 2 | MARCH 2010



The Life of a Building



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Presidents' Report

I am honoured to be contributing to this second edition of FireNZ as the new President of the Institution of Fire Engineers New Zealand Branch. I wish to acknowledge the support and encouragement of Western Fire Region Manager Trevor Brown and Area Manager Kevin Smith in allowing me to fulfill this important role.



I also want to acknowledge the outstanding contribution of Brian Davey as President over the last three years. Brian's tenure has seen some exciting initiatives come to fruition including successful partnerships with PSL, APC & KTL and a developing relationship with the Fire Protection Association (FPA) NZ, all of which means that our branch is in a good position. Brian will continue to serve on the Branch Council as Immediate Past President.

My first duty as President was to represent the New Zealand Branch at the General Assembly meeting held at the Fire Service College at the end of January. Reports were received from all the Branches present before IFE CEO Louise Craig and head office staff briefed the meeting on latest developments. The income base for the Institution continues to broaden reducing the risk of relying almost solely on member's subscriptions. The income from examinations has risen significantly, bolstered by many UK Fire & Rescue Services adopting IFE exams to improve the underpinning knowledge of their personnel. The Services with the most applications for the 2010 examinations are Greater Manchester (760) and Northern Ireland (747). Because of this growth area, a new position of Qualifications Manager will be based at head office to further develop examinations including industry specific exams such as for fire alarms.

Members of the General Assembly then assisted the Board of Directors in developing the IFE business plan for the next three to five years.

The Councillor elections held at the end of 2009 have resulted in three appointments to Branch Council. Daryn Glasgow and Duane Harding-Browne have been re-elected, with Daryn taking on the role of Executive Director, and I am very pleased to welcome John Booth to the Branch Council for the first time. The first Branch Council meeting this year, scheduled for early March, is a weekend planning forum and I thank all the councillors involved for giving up their weekend to participate in this important event. At the forum the Branch Council will set the strategic priorities for our Branch and develop a business plan to deliver those priorities.

March also sees the inaugural meeting of IFE Asia Pacific which aims to develop closer ties between IFE Branches in our region and further strengthen the IFE brand. The fire service and the fire industry continue to evolve, and the IFE must be at the forefront of that change in order to maintain our position as the global organisation for fire professionals. Our strength is in our members and the challenge we face is to ensure that we offer the best possible service to our members in New Zealand, so that we can make a difference.

Gary Ward M.I.Fire E
President, NZ Branch
Institution of Fire Engineers



After a successful launch of our FireNZ Magazine provided at no cost to all those who attended the FPA Conference last September, we are pleased to say that the IFE and the FPA NZ have agreed to further productions of this Magazine. This year, 2010, there will be two publications, one to coincide with the BOINZ Conference and one to coincide with the FPA NZ Conference to be held in Christchurch in November.



We are able to provide this free to members only because of the support from advertisers and we thank them sincerely for their contribution to the success of the magazine. Obviously the best way that we can show our thanks for their support is in the utilisation of the products advertised, so those of you who are in a position to make choices of product I am sure you will do so.

As mentioned this year we will produce two copies of the magazine and if the advertisers continue to support it, our target is to make it a regular quarterly publication for the future. Obviously, those that provide suitable articles for our magazine must also be thanked. We would encourage those of you who would like to contribute to contact us as suitable articles are thankfully received.

Wishing you all the best for 2010 and we look forward to seeing you at the Conference in Christchurch if not before then.

Kevin Kennedy
President, Fire Protection Association NZ





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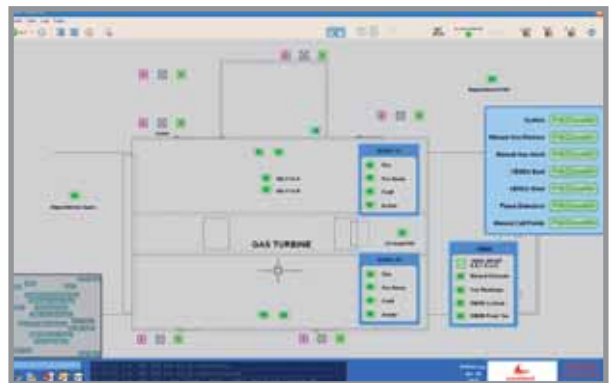
Future proofing fire protection systems in existing power stations

CASE STUDY: OTAHUHU B POWER STATION, AUCKLAND, NEW ZEALAND

Otauhu B Power Station is a 380MW combined cycle gas turbine generator located in south Auckland and was commissioned in January 2000. An earlier Pertronic fire control panel, the F40, supervised Vesda and point type smoke detection as well as the gas flood suppression systems in the main turbine hall, while a smaller conventional fire panel covered the administration building. A basic graphics system was connected to the F40 panel at a later date to provide control room operators with information on the system's status. However, the graphics system was not interactive with the F40 panel, owing to the technical limitations of the equipment.

As part of future proofing the site - and to take advantage of recent technology improvements - the complex has undergone a major upgrade of its fire protection systems during planned maintenance shut downs. In the main turbine hall, two Pertronic F120 analogue addressable control panels now separately support the gas flood suppression and main detection systems (which include flame detection, analogue addressable point detection and Vesda aspirating detection). A third F120 panel protects the administration building, with two additional F120 panels also added to cover remote parts of the site.

All fire control panels are networked together through fibre optic cable, and a pc-based Pertronic Colour Graphics System, also connected to the fibre optic fire network, is sited in the control room. Operators now have full communication and interaction with every device on the extended fire alarm system from one central location, with clear and detailed graphic displays, event logs and system summaries available at all times. Any future expansion of the site can be accommodated by extending the fibre optic fire network and adding new fire control panels as needed, with corresponding additions to the Graphics System.



Lower image is a screen shot from the graphics system

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Executive Directors' Report

IS YOUR FIRE PROTECTION KNOWLEDGE ADEQUATE?

This issue of the Fire-NZ magazine is dedicated to the promotion of the fire protection stream at BOINZ 2010 conference in Rotorua. If you have fire protection questions or need more fire protection knowledge, you must attend.



The Fire Protection Association (FPANZ) recognized some years ago that training of BOINZ members was a priority if effective fire protection systems were to be installed and verified knowledgeably. To this end, in 2008 FPANZ undertook two presentations at the BOINZ Conference held in Auckland. These were on the Passive Research report that was being undertaken and the Sprinkler System Certification (SSC) process. The Association was very pleased to find the room filled to capacity with standing room only, showing a high level of interest in Fire Protection.

Territorial Authorities (TA's) were eager for more knowledge on Fire Protection. For the 2009 Christchurch conference BOINZ provided the FPA a full one day stream with 9 x ½ hour speaking slots. During this day, the FPA provided presentations on a wide range of subjects from design to inspection in a room, again, filled to capacity and overflowing.

Now, in 2010, the FPA has been asked to present a three day fire protection stream at the BOINZ Conference in Rotorua. The programme and speakers are outlined here in this magazine.

The mission statement of the Fire Protection Association is "to provide a professional forum, be the unified voice of the fire protection community and by drawing on our expertise and collective knowledge, reduce the impact of fire in New Zealand".

We can only do this by increasing awareness and knowledge of our industry to a wide audience. BOINZ 2010 in Rotorua gives us the opportunity to expand understanding of our industry.

Bob Taylor
Executive Director
Fire Protection Association NZ



I am pleased to be contributing to this edition of FireNZ in my new role as Executive Director of the Institution of Fire Engineers New Zealand Branch, taking over from Gary Ward who now capably fills the position of President. Gary has taken the administrative and financial aspects of branch management from strength to strength during his term an Executive Director making my transition into the role an easy one. I look forward to working with Gary and the rest of the Branch Council during the next term to continue and improve on the fantastic work undertaken at branch and group level nationwide.



Historically, it's fair to say the IFE has gained the bulk of its membership from the operational and support ranks of the New Zealand Fire Service, and this statistic remains true today. However, our membership base from outside the Fire Service is beginning to show signs of a steady increase. We now receive applications and expressions of interest for membership at all levels from fire protection practitioners, fire engineering consultants, building consent authority personnel and equipment suppliers. As a branch, we are very keen to improve on this trend, and will be promoting the benefits of joining the IFE to these market segments in the months to come.

One of these benefits which I would like to take the opportunity to outline in this column is the ability for members of the Institution at various grades to gain membership of the IFE Registrants Group for the Engineering Council (UK). Membership classes extend from Engineering Technician, Incorporated Engineer and Chartered Engineer.

Membership of the Registrants Group grants the use of the appropriate post nominal (EngTech, IEng and CEng respectively) in conjunction with your IFE post nominal and is a demonstration of your continued maintenance of Continued Professional Development (CPD) and adherence to the Code of Professional Conduct promulgated and advocated by this highly respected organisation.

Should you wish more information on membership into the Registrants Group, visit <http://www.ife.org.uk/engineeringcouncil>.

By the time you read this issue of FireNZ, Gary Ward and myself will have returned from the inaugural IFE Asia Pacific Region 2010 Forum and Conference in Zhuhai, China, where we will represent the NZ Branch in talks on IFE issues pertinent to our local region of the globe, as well as attending a conference which features some very interesting speakers and topics. We will report our findings from the forum and conference in a future issue of FireNZ so stay tuned.

Daryn Glasgow
Executive Director, NZ Branch
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The Life and Death of a Building

Simon K Davis

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Introduction

The general public are, typically, only aware of the reactive side of the Fire Service's organisation. The high profile of fire engines responding to fires or emergencies overshadows the wide range of proactive activities the Service conducts behind the scenes.

The Fire Service can be involved in the complete life cycle of a building - from its design, to its demise. This involvement can begin with the Fire Service being asked by the design team to provide advice on fire safety features. In many instances, the final design will be submitted for design review at the building consent stage. Once built, most non-residential buildings will require alarm connections to the fire service and for evacuation schemes to be approved. Invariably, the demise of a building by fire will be spectacular and result in front page news but even afterwards the fire service will conduct a post fire investigation.

Pre-Design Input

Fire-engineering guidelines

The Fire Service supported the introduction of the International Fire Engineering Guidelines¹ to NZ. This guideline provides methodologies for undertaking a fire engineering design. Central to this design process, is the collaboration of all stakeholders in the development of a fire engineering brief which defines the fire safety objectives for the project. The Fire Service is one of these stakeholders and utilizes this opportunity to provide advice on fire safety systems to achieve life safety and allow for Fire Service operations.

Fire-fighting systems

The Fire Service can provide advice on how a building's fire safety systems can allow the fire service to safely evacuate occupants and undertake suppression activities in the event of a fire emergency. Most fire safety systems will be utilised by the Fire Service to achieve this, and hence, their correct design and installation is essential for a successful outcome.

Design Checking

The introduction of the Building Act 2004 included the opportunity for the Fire Service to provide comments on the fire design. Section 47 of the Act allows the Fire Service to give advice to the Building Consent Authority on the following matters:

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

Evacuation

Traditionally, buildings have been evacuated on an "all-out" basis. This approach is appropriate for low rise buildings, however, is inefficient in high rise buildings. If a building wide alarm sounds, all occupants will enter the available stairs at the same time, leading to over crowding and congestion, and thus slow movement times. The challenge in high-rise buildings is to manage the occupants to ensure their safety, and yet perform the evacuation efficiently in order to minimize congestion and thus speed up movement.

From a Fire Service operational point of view, the flow of occupants down the stairs slows the access of fire fighters to the fire floor. This problem can be alleviated if dedicated lifts for Fire Service use are incorporated into the building. Even if dedicated lifts are fitted, this still leaves the problem when the fire service arrives at the fire floor and want to open the door between the stair and the fire floor. If the stair is not fitted with stair pressurization fans, opening the door will allow smoke to enter the stair and possibly endanger occupants descending from above. Significant smoke is produced even in a sprinkler controlled fire, especially if the fire is shielded from the sprinkler head or the fire has been smoldering for a long time i.e. television fires.

Another danger for escaping occupants is the array of hose deployed under pressure within the stair. This is an obstacle for occupants to pass.

Research conducted overseas² has shown that occupants within apartments, are safer in their own apartments, and that greater life loss has occurred from people trapped in the means of escape. The introduction of performance based fire-engineering has seen a greater variety of building designs, which are based on evacuation to locations within the building.

One challenge all Fire Services face, is checking a residential building for occupants. Invariably most apartment buildings consist of many apartments with locked doors. Checking each apartment for occupants is highly time consuming, and labour intensive.

Attention is also required to ensure the correct selection of a detection system in order to avoid unnecessary evacuation because of false alarms. A correctly operating fire safety system provides the building occupants with confidence in the efficacy of the fire safety systems. Unwanted alarms produce complacency among occupants and disregard for the fire alarm.

To avoid these outcomes the New Zealand Fire Service (NZFS) becomes intimately involved in how occupants are alerted, and mobilised. It also requires the fire service match its operational procedures to the specific type of building. Fire Service staff are now expected to manage the evacuation of occupants.

Fire Service Operations

Unfortunately, many designers give little consideration to Fire Service operations in the design process. The traditional fire service operational procedure in a high rise is to evacuate all occupants in the building. At the same time, the Fire Service will attempt to commence fire fighting. This procedure is acceptable where a stair can be reserved for Fire Service use, and the other stairs used by the occupants. However, this requires the ability to inform the occupants of which stair/s to use.

A common mis-conception by the general public, is the ability of the Fire Service to evacuate occupants using fire service equipment. In New Zealand, the term "high rise" relates to buildings exceeding 25m in height. The average CBD apartment building in New Zealand cities is around 17-20 stories and about 45m to 50m high. Newer buildings exceed these heights. This is well over the reach of any NZFS aerial appliance. Building populations average between 200 to 600 occupants. Only a small number of trapped occupants could be rescued by fire service appliances, and only from the lower floors. This has been played out many times overseas, in harrowing accounts where people are trapped above the fire, and well out of reach of fire service equipment. The Fire Service does not have the resource's to rescue more than a few occupants. "Self rescue" is the only viable method.

In New Zealand most high rise buildings are provided with sprinkler protection, and the fire will normally be limited to the apartment of origin. What then becomes important is quickly determining the location of the fire, gaining access to the location of the fire, and extinguishing it. Typically, the fire will be a small shielded fire that can be easily extinguished, usually with the building first aid fire-fighting equipment.

Conclusion

The NZFS use the various opportunities provided during the design phase and, subsequently, at the building consent review stage, to influence designers to consider the realistic evacuation of the building occupants. Too often, this advice is ignored and the resultant building is not fit for the purpose it was built for.

Many of these aspects are now recognized in Standards such as BS 7974.6³ where, different evacuation management processes are reflected by different evacuation pre-movement times.

The successful solution of these conflicting requirements, requires the concerted effort of all the stakeholders involved in the design of a building.

Footnote

1. International Fire Engineering Guidelines, Edition 2005, Collaborative venture between National Research Council of Canada, International Code Centre (USA) Department of Building & Housing (NZ) and Australian Building Codes Board.
2. Proulx, G, The Impact of Voice Communication Messages During a Residential Highrise Fire, Proceedings of the First International Symposium on Human Behaviour, 30th August – 2nd September 1998, Belfast, in print.
3. PD 7974-6:2004, The Application of Fire Safety Engineering principles to Fire Safety Design of Buildings, Part 6: Human Factors



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Introduction

The Annual Conference and Expo of the Building Officials Institute of New Zealand is the key annual event in which building professionals have an opportunity to develop a better understanding of the responsibilities and duties imposed on them by Acts and Regulations. It also provides opportunities for Institute members to meet and exchange knowledge and ideas relevant to the science of building.

In 2010, the Building Officials Institute of NZ Annual Conference and Expo will feature high quality speakers and presentations that will provide a wealth of knowledge and information to those in attendance.

The Institute will also be joined by members of the Metal Roofing Manufacturers Association and the Fire Protection Association who will attend combined conference sessions as well as specialist topic presentations catering to their particular interest.

Who Will Attend?

Over 500 people attended the 2009 Annual Conference and Expo held in Christchurch and this number is expected to grow once again when Institute members meet in Rotorua during April 2010.

Delegates will include building control professionals, surveyors, architects, builders, developers and others interested in this industry. Other delegates will include those involved in fire protection and fire safety along with those in the metal roofing and manufacturing sectors.

Monday 12 April

11.45am – 12.30pm KEYNOTE – PLENARY “THE FIRE SERVICE: MORE THAN JUST FIGHTING FIRES”
Simon Davis – New Zealand Fire Service

When the general public turn their minds to fire, they probably think of a fire appliance thundering down the road under lights and siren. However, the need to respond an appliance means a wide range of proactive strategies have failed. Significantly, the implementation and success of these strategies involves either directly or indirectly, a wide range of organizations beside the fire service. Opportunities exist throughout the life cycle of a building to influence the safety from fire of its occupants. The success of this requires the co-ordinated efforts of these organizations.

12.30 pm – 1.30pm Lunch

1.30pm – 2.30pm “FIRE SAFETY 21ST CENTURY – A NEW AGE OF CONSENT”
Nick Saunders – Department of Building and Housing

This presentation will provide an update on progress of the introduction of new methods to show compliance of fire safety designs. It is expected that at the time of the conference the Department will be close to publishing proposals for public consultation.

2.30pm – 3.00pm “GUIDING FIRE SAFETY DESIGN – A POINTER”
TBA – Institution of Professional Engineers New Zealand (IPENZ)

A document outlining the minimum requirements for the fire safety aspect of building consent applications has been developed and is soon to be published. This presentation discusses the development of the document and introduces its content. Use by BCA's, designers and others in the sector will also be discussed

3.00PM – 3.30PM Afternoon Tea

3.30 – 4.00PM “USE AND ABUSE OF FIRE MODELS”
Charles Fleischmann – University of Canterbury

Over the last twenty years fire modeling has made significant advances starting from simple equations to zone models to computational fluid dynamic models capable of predicting complex fluid flows and combustion processes. The building fire design issues that can be addressed with computer fire models are enormous but the potential for abuse is infinite. Abuse of fire models can range from simple incompetence of the user to deliberate manipulation of the input to achieve the desired results. This presentation focuses on the potential abuse of fire models and highlights specific abuses that a review of fire modeling results should watch out for.

Tuesday 13 April

11.00 – 11.30AM

"NZFS DESIGN REVIEW – 5YEARS ON! SAME BUT DIFFERENT?THE LESSONS LEARNT SO FAR"

Simon Davis – New Zealand Fire Service

In response to feedback from the regulator (Department of Building and Housing) and a number of Building Consent Authorities, the fire service has sought to improve the advice offered in its memo's. In addition, the NZFS has attempted to become more proactive in providing advice to designers. A designers manual has been under development aimed at assisting designers with their design. The lessons learnt to date have prompted the NZFS in 2010 to become more active in following up the results of its reviews. To this end it will seek more specific feedback from BCA's as to their requirements. Developments to date will be discussed.

11.30 – 12.00PM

"HOW TO CHOOSE A FIRE REGULATORY COMPLIANCE REVIEWER"

Alan Moule – National Consultants Limited

Carol Caldwell – Enlightened Solutions Ltd

This presentation will focus on ways to improve the use of Regulatory Compliance Reviewers for fire designs working on contract directly to a Building Consent Authority. The BCA should be in absolute control of this process and have a written procedure. The procedure should set out the expectations of BCA relating to the fire review. A controlled process with definite requirements will improve the quality and consistency of the review and reduce the risk exposure of the BCA.

12.00 – 12.30pm

NZFS AUDITS – "THE GOOD,THE BAD AND THE VERY BAD!WHAT'S CHANGED?"

Simon Davis – New Zealand Fire Service

The NZFS Design Review Unit has undergone its second technical audit, again conducted by two highly reputable organizations. This presentation will outline what's changed and what needs to change. In addition, the unit also underwent a process audit following a letter to the Fire Service Commission. This was undertaken by a consultant intimately involved in the development and implementation of the Building Act 2004. These audits are available on the NZFS web-site.

12.30 – 1.30pm

Lunch

1.30 – 2.00pm

"ALTERING VIEWS OF S112"

Peter Sparrow and Nick Saunders – Department of Building and Housing

Alterations and change of use of buildings continue to challenge by Building Consent Authority staff and consent applicants alike particularly in the area of fire safety. This presentation will provide some insight and some suggestions on how to approach dealing with these challenges.

2.00 – 2.30pm

"THE LIFE AND DEATH OF A BUILDING: PROACTIVE PREVENTION RATHER THAN REACTIVE LEGISLATION"

Simon Davis – New Zealand Fire Service

The NZFS is becoming more involved in the complete life-cycle of a building. To support this involvement the service is undergoing a fundamental change in culture. Typically, the service has been seen as the ambulance at the bottom of the cliff. Instead, the organization is being repositioned to reduce and prevent fire events occurring or at least reduce their consequence. This provides the opportunity to interact with other interested parties so as to resolve design issues rather than correcting expensive construction mistakes. This requires the goodwill and involvement of all sectors of the construction industry.

2.30 – 3.00pm

"A COMPLIANCE SCHEDULE :A NOVEL, NOT A SHORT STORY!"

Nick Saunders – Department of Building and Housing and

Andrea Evason – Tauranga City Council

Compliance schedules are an important piece of building regulation and need to be both informative and correct. It is intended to provide information on the requirements and some good practice in this presentation.

3.00 pm to 3.30pm

Afternoon Tea

3.30 – 4.30pm

"FIRE PROTECTION INSPECTIONS – THE APPROVAL PROCESS"

Chris Mak – AON / Nigel Robinson – Verifire / Peter Broome – Fire Protection Inspection Services

This presentation will briefly cover the historical background that has led to the current approval processes for both fire sprinkler and fire alarm systems in New Zealand. This will lead to a description of the various steps in the approval processes and the functions of each organization involved. Certificates and approval documentation will be discussed, with particular emphasis on their relevance to Building Code compliance and the information contained in each certificate. Issues associated with ongoing system compliance following initial certification, and their relevance to the building WOF and 12A's will also be covered.

4.30pm to 5.00pm

Fire Protection Discussion Panel

Wednesday 14 April

11.00 – 11.30AM	"PASSIVE FIRE PROTECTION – THE CURRENT STATE OF AFFAIRS" Greg Baker – BRANZ Ltd During this presentation, Greg will give delegates a comprehensive update on all things passive fire protection in New Zealand, with a particular emphasis for building officials. Following publication by FPANZ in 2008 of a research report into the standard of passive fire protection in New Zealand buildings, an extensive and wide-ranging programme of work has been underway in the intervening 18 months to improve the standard of the delivery of passive fire protection in the building and construction industry. These initiatives have dealt with systemic aspects, industry education and qualifications, the industry profile of the sector, as well as a coordinated and effective flow of technical information.
11.30 – 12.00PM	"FIRE RESISTANCE RATINGS AND COMPARTMENTATIONS" Hans Gerlich – Winstone Wallboards Ltd The role of passive fire protection with particular reference to Fire Resistance Ratings and what to look out for.
12.00 – 12.30pm	"OPENINGS THROUGH FIRE RATED WALLS" Geoff Willis – Norfolk Building Products Are they acceptable or alternative solutions? What constitutes failure of a fire test? What does a fire test actually look like? How can I tell if a fire door complies with the Standard and how does the manufacturer prove it?
12.30 – 1.00PM	Fire Protection Discussion Panel
1.00 – 2.30pm	Lunch With Invited Guest Speaker
2.30PM	Close of Conference

Biographies for BOINZ Fire Protection Stream Speakers

Simon Davis, NZ Fire Service

Simon Davis is the National Fire Engineering Manager for the New Zealand Fire Service. The fire engineering unit consists of a team of engineers, technicians and administrative staff. This unit provides technical expertise to the Service and is also responsible for the discharge of the NZFS regulatory functions in terms of the Building Act and the Fire Safety and Evacuation of Building Regulations. The engineering unit works on a broad range of both regional and national projects, both in fire safety and operational aspects.

Simon completed a Bachelor of Mechanical Engineering at Auckland University in 1981 followed by a career in Building Services. He has worked as a consultant, contractor and in the manufacturing fields in New Zealand and overseas. Simon completed a Masters in Building Science from Auckland in 1997 and a Masters of Engineering (Fire Engineering) from Canterbury in 1999 and also completed a Graduate Diploma in Management in 2009. The National Commander has nominated Simon as a person deemed competent to give advice to Territorial Authorities in terms of section 121 of the Building Act.

Nick Saunders – Department of Building and Housing

Nick Saunders is a Senior Advisor at the Department of Building and Housing. He has been associated with the fire profession for over 20 years, firstly in the UK and the past 11 years in New Zealand, the last five of which has been at the Department with the responsibility for fire engineering matters. He has been closely involved in the review of the Building Code and the development of a new framework for fire compliance.

Charles Fleischman, University of Canterbury

Charley Fleischmann is an Associate Professor at the University of Canterbury where he has been a major contributor to the Graduate Fire Engineering Program since its inception in 1994. Charley received his Bachelors degree in Fire Protection Engineering from the University of Maryland and his Masters and PhD from the University of California at Berkeley. Much of his research focuses on fire modeling both experimentally and numerically with particular interest in compartment fire phenomena including backdraft and flashover.

Charley has over 20 years of experience in fire engineering research and practice. His consulting work includes fire cause, origin, and development as well as specialist consulting on fire design issues. He has given expert witness testimony in civil, criminal, and family court. Since 2004, he has served on the Fire Advisory Panel for the New Zealand Department of Building and Housing. In 2006 he was engaged as a consultant to work on developing a new framework for performance based design for fire safety in New Zealand. He has over 80 academic and professional publications and has presented many invited and key note presentations internationally.

Carol A Caldwell, Enlightened Solutions Ltd

Carol A Caldwell is a practicing fire engineer with close to 30 years of experience. She is a "Fellow" of Institution of Professional Engineers of New Zealand and a "Member" of the Society of Fire Protection Engineers. She is a registered professional engineer in

both the State of California in the USA, and fire protection in New Zealand. Her academic degrees are a Bachelors degree in Fire Protection Engineering, 1981, from the University of Maryland, USA and a Masters degree in Safety from the University of Southern California, USA.

Carol is currently the director of Enlightened Solutions Ltd, a specialist fire engineering company established in 2004. She provides a wide variety of fire engineering design solutions, both prescriptive and performance solutions. Projects have included museums, heritage buildings, offices, hotels, department stores, shopping malls. She has also provided fire peer review services for a number of Councils, including 2½ years working in Auckland with Auckland City Council. She was the author of Guideline for the Council to implement their own procedures for fire peer reviewers.

Alan Moule, National Consultants Ltd

Alan Moule is a qualified and experienced fire engineer with over 22 years experience in fire and fire engineering in both the UK and NZ. He is the principal of National Consultants Limited, a specialist fire and compliance consultancy. He holds a degree in Fire Engineering from the University of Central Lancashire, is a Member of the Institution of Professional Engineers (NZ), a Chartered Engineer and a Member of the Institution of Fire Engineers. He has a wide experience in many roles concerning fire from military service through to working at the highest regulatory level. Before entering the private field in NZ he was employed in New Zealand with the Department of Building and Housing.

Peter Sparrow, Department of Building and Housing

Peter is Senior Advisor Performance Monitoring and Review. He has worked for the Department since its establishment in November 2004. Peter works in the Consent Authority Capability and Performance Group undertaking technical reviews. Peter has held various positions in the construction industry over the past 15 years including positions in local government, the military and the private sector.

Andrea Evason – Tauranga City Council

Andrea has worked in Building Services at Tauranga City Council since March 2005. Andrea works in the Building Warrant of Fitness area, primarily issuing Compliance Schedules and carrying out audits. Andrea has been the driver in developing the processes, documentation and Compliance Schedules for the Building Warrant of Fitness regime in line with the Building Act 2004. Prior to working in building Services, Andrea has had a variety of positions working in the private and public sector covering leisure, housing and monitoring.

Nigel Robinson, VeriFire

Nigel Robinson (BSc, MSFPE) is the Technical Manager for VeriFire. After graduating with a BSc in chemistry from Victoria University in 1978 Nigel worked as a research and development chemist before joining the Insurance Councils technical department in 1987. With the closure of the Insurance Council regional offices in 1989 he joined Fire Protection Inspection Services soon after it was formed, where he was responsible for inspection and certification of both fire sprinkler and fire alarm systems. Nigel moved to VeriFire in 2005, having spent some time subcontracted back to the Insurance Council in 1999/2000 and assisting with the initial setting up of VeriFire in 2001. He has been associated with various NZ4541, 4515 and 4517 standards committees over the last 15 years and completed a Victoria University course in fire safety design in 2001. He has over 20 years experience in all aspects of sprinkler system and fire alarm system certification and assumed the role of technical manager for VeriFire in 2008.

Chris Mak, Aon New Zealand

Chris has over 25 years experience in the fire protection industry in engineering and management positions. He is currently employed to head Aon's Sprinkler System certification business unit. Previously, he was the engineering manager for NZ's largest fire protection installation and service company. He is a Chartered Professional Engineer and is the current President of the Society of Fire Protection Engineers (NZ Chapter). He has been involved in the preparation of numerous fire protection standards, including Chairing the committee that drafted the latest revision of NZS4541 "Automatic Fire Sprinkler Systems".

Peter Broome, Fire Protection Inspection Services Ltd

Peter Broome is the General Manager of Fire Protection Inspection Services Ltd, an IANZ accredited inspection company committed to maintaining Fire Safety Standards in New Zealand. FPIS operates a network of Technical Officers throughout the country working with building owners, local authorities, fire contractors, fire engineers, the NZ Fire Service and insurers. The company also plays a significant role in maintaining the largest database of sprinkler protected buildings in New Zealand with this information readily available for stakeholders to reference Fire Sprinkler Systems. FPIS is committed to improving Fire Safety Systems in New Zealand through an accredited inspection process that takes an active part in protecting property and people.

Greg Baker, BRANZ

Greg Baker has worked for almost 25 years in the building and construction industry. Having started in engineering consultancy, Greg then worked for 14 years in manufacturing, construction and contracting and since 2002 has been Fire and Structural Engineering Manager at BRANZ in Wellington. For the last four years, Greg has been Chair of the FPANZ Passive Fire Protection Group, a technical committee which provides the only unified voice for the passive segment of the fire protection industry. Greg has an undergraduate degree in civil engineering from the University of Auckland and a post-graduate degree in fire engineering from the University of Canterbury.

Hans Gerlich, Winstone Wallboards Ltd

Originally from Holland, Hans Gerlich has a Bachelors degree in Civil Engineering and Masters degree in Fire Engineering. He has worked in contracting, local authority, research and product appraisals and for the last 20 years has been the Technical Manager Building Systems for Winstone Wallboards Ltd, responsible for technical publications such as GIB® Bracing, Fire and Noise Control Systems.

Geoff Willis, Norfolk Building Products (Metabolt)

Geoff Willis is the General Manager – Doors for Norfolk Building Products. He has had over 30 years in the fire protection industry, starting as an Engineering Cadet with Wormald, followed by extensive involvement with the design, fire testing, manufacture of, and regulations applying to, hinged and sliding fire doors and fire rated roller shutters. Geoff is also the Fire Protection Association NZ representative on NZ Standards and joint AUST/NZ Standards committees for these products.

HOW TO CHOOSE A Fire Regulatory Compliance Reviewer

Carol Caldwell, Enlightened Solutions Ltd

*Wouldn't It Be
Nice If You Had
Confidence That
Your Fire Reviewer
Was Suitable For
The Job?*

FIRE DESIGNS

Fire designs submitted for building consent can still present a challenge for the Building Consent Authority, BCA. Some designs are relatively straightforward using 100% C/AS1 Acceptable Solution while others can be extremely complex and innovative pushing the boundaries of our engineering knowledge. Complicated fire engineered solutions typically involve detailed analysis incorporating numerical equations, fire modelling and even predictions of people movement and behaviour.

When fire modelling is used to justify the design – it can range from less complex zone models, such as BRANZFire to more complex computational fluid dynamics models like FDS. If modelling the movement of people, one may use a simple hydraulic model or complex computer codes that incorporate human interactions and look more like a computer game than an engineering analysis.

Fire engineered designs frequently rely on technical journals, articles and text books to support the analysis, yet often the engineer cites only the name of the article or book without providing specific section, page, or equation numbers. This requires the reviewer to be familiar with the literature and makes it difficult for other fire engineers to follow much less BCAs.

THE BUILDING CONSENT PROCESS

It is important to remember the building consent process is YOUR process – the BCA can establish their own process to ensure building consents are appropriately reviewed. Ideally, the fire engineered design would have gone through the Fire Engineering Brief, FEB process involving the BCA before the final submittal for consent. If this occurred then hopefully most issues related to technical references and methodology were resolved. Regardless, the design still requires fire regulatory compliance review. Selecting the fire regulatory compliance reviewer is responsibility of the BCA and is ultimately your choice. The BCA is often liable when things don't go right so it is important to control the process to suit the needs of the BCA.

QUALIFIED STAFF

Most BCAs do not have qualified fire regulatory compliance reviewers on their own in-house staff. Therefore they are forced to rely on outside fire regulatory compliance reviewers to assist them in determining if a fire engineered design meets the Building Code. It is prudent for the BCA to assess and document the qualifications of the engineer providing the fire regulatory compliance review

services. It should be specific to the individual and not the company as it is too important to leave the review to a less experienced engineer with only oversight from a senior engineer.

It is recommended that the following questions be answered satisfactorily:

- Are they a Chartered Professional Engineer?
- Was 'fire' the Practice area assessed for CPEng?
- What will the fire regulatory compliance reviewer do if the fire engineer uses methods, equations, computer models, or research that they unfamiliar with or have not used before?

The questions above are very important to ensure the technical quality of the fire regulatory compliance review. A yes to #1 and #2 is not a guarantee that the fire regulatory compliance reviewer will provide a satisfactory review on behalf of the BCA but it goes a long way towards it. Registration as a Chartered Professional Engineer (CPEng) is gained by demonstrating competence in the specific practice area and requires the CPEng to be reassessed every 5 years. Simply having a CPEng registration is not sufficient for the reviewer, it is vital that the reviewer's practice area be in fire engineering.

Requiring the reviewer to be a CPEng in fire engineering provides the proper documentation that the BCA has taken the appropriate steps to ensure they have engaged an appropriate reviewer. There are special circumstances when the CPEng is not necessary such as an individual with special expertise but these situations need to be addressed on a case by case basis.

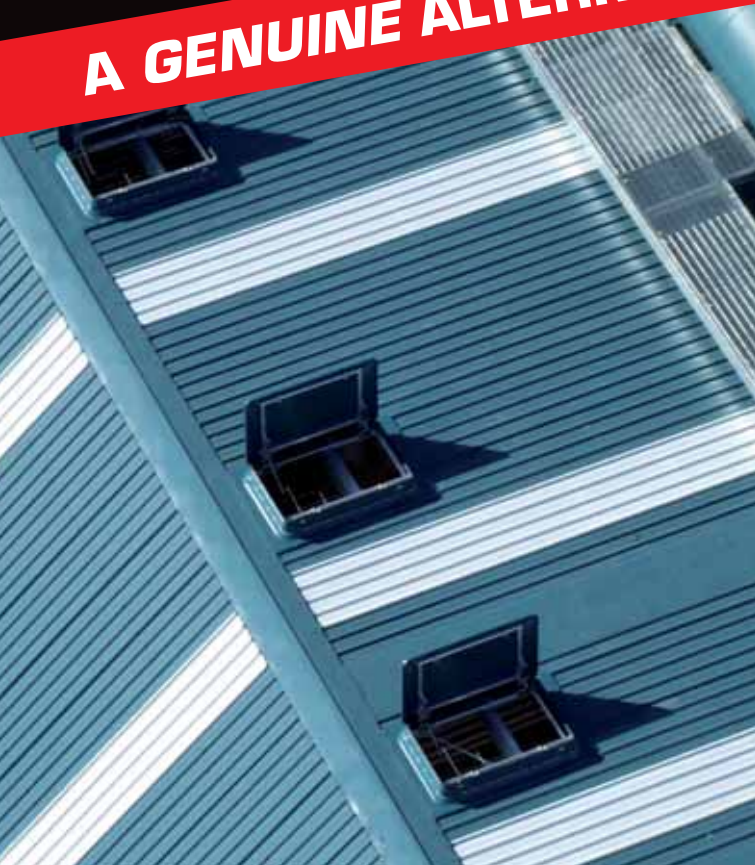
CAUTION

There are examples of CPEng engineers (not assessed in the practice area of fire) providing fire engineering services. These fire engineering services have involved fire engineered solutions not just the use of C/AS1 Acceptable Solutions. Their practice areas have been civil engineering and mechanical engineering. Simply being registered as a CPEng is not sufficient to demonstrate competence for fire engineering design or fire regulatory compliance review. The reviewer must demonstrate expertise in fire engineering.

BOTTOM LINE

The BCA has the responsibility to ensure that the individuals providing the fire regulatory compliance review services are appropriately qualified. These same comments are applicable to all areas of engineering regulatory compliance review.

A GENUINE ALTERNATIVE TO SPRINKLER SYSTEMS



Alsynite Emergency Ventilation Hatches are roof-mounted smoke/heat release vents, used as part of a building fire control system.

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They ensure that heat and smoke are vented, increasing the time available to evacuate therefore giving the fire service a greater chance of getting a fire under control.

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- New Zealand manufactured for New Zealand buildings
- Fully compliant with the New Zealand Building Code of Compliance documents for fire safety
- Appraised by BRANZ



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South Island, NZ: Philip@alsynite.co.nz





Why Go To Conferences?

Mitchell Brown *M.I. Fire E.*

IFE Branch Councillor,
FPA NZ Executive
Committee

I have been in the fire industry for 27 years and very early on, as part of my personal drive for learning and appreciation of what was out in the wider world, I attended conferences.

Now that I have attended many conferences here in New Zealand, over in Australia and the massive events put on in the USA, I ask myself the question – **“Why go to conferences?”**

I did some research and, coupled with my own experiences, I share with you the following principles to answer the question!

Learning

Essential to attract delegates to conferences is a range of keynote and relevant speakers that provide information and learning that enhance conference attendees' knowledge.

Of course learning at conferences can be achieved in many ways. Attending the key note, main stream and any themed streams conference presentations allows delegates to attend and focus on relevant information.

More learning is achieved from the exhibitors and sponsors. The latest in technology and information is always on display by commercial entities who are looking to promote and sell products to the industry. It is a varietal lolly shop of latest and greatest devices and products which again provide learning and knowledge about the current fire industry landscape.

Learning is informally achieved through the discussions had with other delegates and attendees to conferences outside of the main presentation times.

Networking

One of the best reasons to attend conferences is the networking with other professionals in your industry. Apart from reacquainting with friends and agencies from previous conference attendance, the opportunity for meeting new contacts and exchanging contact details with business cards, will benefit your personal and organisational network building. They say it's not what you know, it's who you know. I like to think that what you know is pretty important too, but who you know can't hurt either.

Branding

In the process of this networking you will be branding your business and yourself as a professional and/or an expert in your industry. If you do this well enough (and attend enough conferences), along

with maintaining a positive reputation through a number of avenues including publications and the web, you can become one of the people that other people in your industry want to get to know. If you achieve that status, chances are your business will be doing fine. For companies and organisations that are supporting the networking opportunities you can also hand out branded promotional items that ensure your organisation remains foremost in peoples' minds.

Your Niche

When attending conferences, exhibitions, seminars and other events you should look for learning, information and networking that is relevant to your particular part of the industry.

There are going to be events that you really benefit from as far as networking and branding. There will be events that are fringe and perhaps will not provide as much benefit from your attendance. The reasons for going to these events still need to be weighed up. The economic times will dictate to what level you are able to afford to attend a conference or other event.

Food!

Great conferences have great food! Not only do they have great food, but the conference proceedings provide enhancements to delegates enjoying the breaks for refreshments with browsing and interaction with networking and learning through contact with other delegates exhibitors and sponsors. The venue can be a factor in how this able to be achieved. Exhibitions close to the auditoriums with external environments that promote enjoyment and relaxation for conference delegates will leave a lasting successful event memory.

Local Entertainment

Conference delegates need to have opportunities to get out and enjoy the local culture and activities that are relevant to the location that the conference is being held. Partners programs are a feature of a number of conferences. This allows for the conference attendees to make the conference part of a opportunity to visit and experience new places with their partner.

The Manchester Convention Centre answered a range of questions on their web site:

So Why Are Conferences Important?

Business meetings and conferences have a valuable role to play for any organisation seeking to increase



profitability, efficiency and the all important communication flow; both internally within the organisation - and externally with affiliate colleagues, partners and clients. Good conference events can help with team building, provide training and development; deliver incisive marketing, build client relationships and be a useful reward for staff and colleagues. They can also be rewarding social occasions in their own right.

What Can I Learn From Attending A Business Conference?

Business conferences are a valuable opportunity to learn more about yourself, your role and relationship to others; as well as agenda setting, evaluating the make up of an organisation or department in greater depth; or just giving or receiving a pep talk. The main thing to remember about enjoying a successful conference event is that it is your conference. For your conference to work for you - you have to have focus and be clear about your own goals, during its planning and execution.

Why Should I Attend or Organise A Conference?

There are many factors which will contribute towards a successful business but clear communications and good professional relationships are certainly high on the list. A quality conference environment allows you as an organiser or as a delegate to set aside time to foster these areas while evaluating, promoting or targeting key organisational goals relevant to you. In a nutshell: good conferences are an opportunity for high quality communications, working out corporate strategy, team bonding, promotion and staff development; as well as providing superb opportunities for networking, and forming new business relationships.

Is Conference Networking Good For Team Building?

From our experience of conferences and speaking to conference goers at all levels and from the diverse sectors we encounter it is clear that spending time with colleagues and potential clients face to face in a

professional tailor made environment is highly productive. Business colleagues communicate and work more effectively together if they know the face at the other end of the telephone.

What Outcomes Are There From Successful Conference Networking?

People like spending money with a business; and or employing the services of that business or organisation if they have had contact with someone on a personal level from within the organisation. Business colleagues are more likely to enter into other kinds of worthwhile reciprocal relationships if they have discussed issues in the focused professional environment of a conference event.

Can Conference Networking Be Enjoyable?

Conferencing networks are not just about commercialism. Networking can create more informal relationships as well, and can even mean forging friendships. Forming relationships with colleagues with similar backgrounds or with similar roles, from outside your own organisation, can be a very positive experience. It can be liberating and beneficial to talk about business or organisational issues with people who understand them and are experiencing them just like you are. It is also rewarding to pass on advice to others as well as take it from those with greater or more specialised experience.

What Other Benefits Can Result From a Successful Conference?

Clearly a conference event is organised as a time to prioritise your own business objectives but there are several obvious benefits which can result from a successful conference. Staff at all levels can leave motivated and invigorated; refreshed by making new contacts and learning new initiatives. Sometimes just being in a different environment from the norm can be extremely helpful in refreshing batteries, refocusing and clarifying personal and business goals.

Are Business Cards Important?

Yes. Make the most of your conference event by taking business cards with you. Take a box of them. Try to avoid free business cards because they do not create a good impression. Instead use a quality plain printed card or embossed card and ensure you have enough of them with you. Business cards are a low-cost and highly effective way of marketing yourself and your organisation. A good conference tip is to make a note for future reference on the back of any cards you receive.

How Does One Conference Network and Speak With People They Don't Know?

It's easy. Relax. Be yourself. Break the ice. Think of a few ice breaking remarks. Remember queuing for a coffee or a cup of tea is as good a place to meet people as it is in the conference hall. Enjoy the experience, try and learn something and have a nice time. Get to know people and the business side of things will usually follow.

Any Quick Conference and Networking Tips?

Here are some quick recommendations and tips to ensure you obtain the most from your next conference event:

- Be positive. Enjoy yourself and try to get the most out of the experience you can.
- Don't be shy to ask questions.
- Take a seat down the front to make the best of any presentations.
- Don't be embarrassed about wearing name tags. You are there to mix and relate. Read other people's tags and make contact.

Also, finally: don't work too hard. Make some extra time if you can to see some of the local sights. It is allowed and it's beneficial. All part of the conference experience.

See you at the next conference, Fire NZ 2010, 3-4 November, Christchurch Convention Centre.

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LIFE OF A BUILDING

Introduction



Preventing

Advice offered to the community and businesses:

- Fire Fighting Crews
- Promotion & Education teams
- Fire Safety Officers
- Fire Engineers

Protecting

Best solutions for:

- Planners
- Designers
- Owners
- Occupiers

Responding

We respond to all emergencies. However proactive measures in prevention and protection will save lives and minimise loss.



Fire Safety



Fire safety is the responsibility of all building owners.

- Means of Escape
- Fire Fighting Equipment
- Active Fire Systems
- Evacuation of Buildings
- Appliances

Unwanted False Alarm Activation

Recommendations for the Fire Alarm Contractor

- Offer professional advice to owner.
- Correct and appropriate installation.
- Prevent false alarm activation.
- Determine cause, not just reset system.
- Attend meetings with owners and Fire Service to address issues.
- Gain Fire Service assistance when required.

Evacuation Schemes

Approval Process

The scheme approval process is managed by a National Unit. The responsibility for the scheme is placed squarely on the applicant. The Fire Service has to be confident that the scheme as submitted will work. Refer to <http://evaconline.fire.org.nz> for more information.

Building Survey

If a scheme were evacuation to a place of safety inside the building is proposed, the Fire Service may need to survey the building to ensure that the place or places of safety meet the Fire Service criteria.

Scheme Maintenance

If building owners are not providing notification of trials or training at the appropriate time, this could trigger the need for a building survey under Section 21F of the Fire Service Act 1975.



Fire Engineering



Good documentation = improved profitability

A range of organisations within the New Zealand construction industry have realised that poor documentation impacts heavily on the profitability of a building project.

Fire Fighting Facilities



The "Fire Service Operations in Buildings" guide is updated at regular intervals and can be found on the Fire Service website at www.fire.org.nz

Building Act

The Engineering Unit is required to provide advice to the Building Consent Authority on the fire engineering design of the Gazetted buildings. This advice is in the form of a memorandum covering the following matters:

- Provision for means of escape.
- The needs of the Fire Service to enable it to undertake fire fighting.



vation

hwanted alarms.



Building Survey

Building Fire Safety Survey

Building surveys form the backbone of Fire Service strategy for managing fire risk within building stock. Buildings may have a lifetime of 100 years or more, and the fire safety risks within that building need to be managed over the life of the building.



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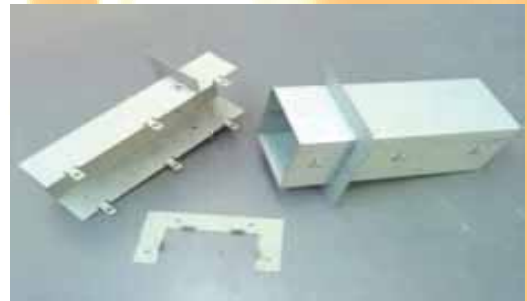
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SHOWING COMPLIANCE OF FIRE SAFETY DESIGN IN NEW ZEALAND FOR THE 21ST CENTURY

The Department of Building and Housing is Currently Working on Updating the Building Code and Compliance Documents for Fire

Background To The Projects

A review of the Building Code was completed in November 2007. A major recommendation was that the fire safety requirements should be more clearly specified and that "specifying fire design scenarios and performance requirements to be taken into account when designing for fire safety be investigated" (Department of Building and Housing, 2007). Furthermore the report of the review suggested that: "the Building Code would: specify performance requirements for fire design, specify design scenarios and the design fires that must meet performance requirements and define fire design scenarios including: fire parameters, occupant behaviours and active and passive fire systems. (Department of Building and Housing, 2007).

Fire Safety Design

A small workgroup was established to develop a fire safety design framework as recommended in the report on the Building Code Review. By mid 2009 the framework was at a stage where wider input and comment was sought. A period of field testing of the framework was embarked on, commencing at the FPA annual conference in September 2009. Feedback on the field testing was provided in November.

Acceptance Criteria

Acceptance criteria are a critical part of a framework for the rational design of fire safety. The acceptance criteria considered have two options for assessing the life safety threat to occupants of a building; either

- occupants are not exposed to smoke by demonstrating that the smoke remains 2.5 m above the floor (above head height) and does not exceed a certain temperature; or
- if occupants are exposed to smoke, then undertake a specific analysis of the expected visibility through the smoke and calculate a 'fractional effective dose (FED)' for exposure to heat and toxic gases and compare these to detailed acceptance criteria that must not be exceeded. An FED of 0.3 is proposed as the acceptance criteria within the fire safety design framework.

The fractional effective dose is a measure of the accumulated dosage of heat or toxic gases and takes into account both the concentration and the duration of exposure and is a measure of the fraction of an incapacitating dose. i.e. when the FED reaches 1 incapacitation is assumed to occur.

Acceptance criteria for tenability for fire fighters and for structural performance are also proposed.

Design Fire Scenarios

The framework uses a number of scenarios to test a fire design. Some of these test scenarios are derived from scenarios used in a US design code (National Fire Protection Association NFPA 5000). The test scenarios are designed to ensure that a realistic range of fire exposures are addressed by the building design. It is also expected that various fire safety measures that are currently required under the current building code would also be required using the framework, but there could also be other innovative means of satisfying the acceptance criteria. Part of the analysis

done by the fire safety designer would include calculating the available safe egress time (ASET).

In the fire safety design framework the design fires associated with each scenario are specified and characterised using one of several parameters including how fast the fire grows and its maximum size (in terms of heat produced).

Occupant Behaviour

The final piece of the framework relates to the time taken for the occupants of the building to move out of danger (the required safe egress time or RSET). The framework provides information that allows the calculation of detection time, pre-movement time and travel times that together sum to the time to reach a place of safety. If this time occurs before tenability is lost (ASET > RSET) then the design would be considered to be safe.

Revision of the Acceptable Solution

A revision of the acceptable solution for fire safety, C/AS1 has recently commenced.

To assist the Department scope this revision a workshop was held in October. A large number of fire engineers and building control staff attended. The workshop focussed on the scope, format and technical details of C/AS1.

Scope

The consensus of the workshop was that the scope of the acceptable solution should be restricted in terms of the types of buildings that C/AS1 addresses (but there is a need to ensure that the large proportion of New Zealand buildings would still be able to be designed using C/AS1). It also suggested that the acceptable solution should not cover some specific situations such as atria, smoke control design and buildings with a large occupancy (such as stadia).

Format

The attendees at the workshop requested that navigation through the acceptable solution was made easier.

Technical Changes

The workshops also identified a number of technical areas that might need reviewing to improve clarity or better specify the requirements, this includes specification for:

- Effective venting in single storey buildings
- Limits on firecell floor area
- Fire resistance ratings
- Car parks and car parking buildings

The Department will develop a draft acceptable solution and seek comment from the industry.

Public Consultation

The Department intends to seek public comment on changes to the Building Code and Compliance Documents for fire safety when the development work on the fire safety design framework and acceptable solution has been completed.



Nick Saunders
Department of
Building and Housing
Te Tari Kaupapa Whare



Technical Training in FIRE PROTECTION INDUSTRY

R J Fraser
OBE, BE, FIPENZ.

The recent decision by Universities and the Institution of Professional Engineers of New Zealand to follow the International Accord for University Degrees to be extended from 3 to 4 years, and 4 to 5 years is targeted to produce more research oriented graduates and will enable New Zealand engineers to continue to be employed overseas.

The other change is – from 2011 – to offer a common curriculum through the Polytechs for a National Diploma in Engineering in mechanical, electrical and civil engineering. In addition there will be an 'applied' option involving the Industry Training Organisations to include on job experience. This will allow the fire protection industry to introduce Level 5 and 6 units specific to industry needs.

Technician graduates with an adequate level of marks should be eligible for entry into a degree programme and the Master of Fire Engineering at Canterbury University but this will need to be worked through with the University. In our experience practical people-oriented technician graduates are the key in the successful fire protection contracting companies.

Last year in September/October, consultation occurred on a proposed unified diploma system for technician engineers. The outcome was unanimous support from industry, tertiary providers and industry training organisations (ITOs) for the development of a unified system. Work has begun on the development of this system and initially the academic diploma (NZDE) by lead groups in the civil, electrical and mechanical disciplines. Members of the lead groups are representatives from tertiary providers and relevant ITOs. The goal is to have the governance structure in place and the NZDE approved for delivery in 2011. A fire engineering stream is yet to be considered. Development of the work-based diploma (Diploma in Engineering Practice) will occur later this year.

The NZ Institution of Professional Engineers has established membership at this technician level which is a very positive benefit in future registration for specific certification recognition under the Building Code.

Based on experience of past cadet schemes using the old National Certificate of Engineering programme, this new NDE should maintain quality assurance in performance of fire protection systems at the present high level.



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FIRE DETECTION SYSTEMS MAINTAIN OR ABOLISH?

Warwick Isemonger
NSW Fire Brigades, Australia

From a worldwide perspective fire services attend over ½ million system generated false alarms per year from installed fire detection systems.

With the average cost of fire services attending a call estimated at over A\$1000.00 a call is it any wonder that fire services worldwide began :

- Charging for attendance to false alarms
- Began to modify or vary their weight of response to false alarms

And

- Have little faith in the quality of fire detection technology.

Clearly this should sound alarm bells for the industry as building owners:

- start to feel the cost of a fire service attending a false alarm
- begin to question the calibre and quality of service they are receiving from fire protection companies
- begin questioning the justification of having a fire detection system installed at all when the fire service considers them needless or nuisance calls and doesn't take responding to them seriously

So is there any reason a building owner in the future may seek to engineer out of his building a monitored fire detection system when in all likelihood he is most likely to have a considerable

number of false alarms and consequently false alarm charges levied against his premises.

It may even be said that such systems should be abolished if the fire service does not take response to needless or unwanted false alarms seriously. The Building Code of Australia requires Smoke detection to provide early warning to occupants of a fire not of a false alarm.

SO WHAT IS THE ANSWER?

Fire Services, Fire Protection Professionals and the Fire Protection Association have joined forces to try and address this world wide trend that has some serious implications for the industry worldwide.

It is an Australian initiative and has the potential to capture interest on a universal scale. So what is it ?

To some it may be called collusion but really it is information sharing and working together to achieve viable solutions to a global trend and problem.

So 2007 sees Fire Services and the Fire Protection Industry in Australia through AFAC and the FPAA forge working relationships that it is hoped will address the problems and general poor performance of fire detection and how new technology and innovative solutions can contribute to a sustainable future in the fire detection and protection industry.

In 2009 what has changed, the cost of attending false alarms has increased so have the false alarms charge applied to any false alarm and more and

more fire services are charging for attendance at false alarms yet the number we have attended still keep rising each year.

Most states in Australia and New Zealand under the AFAC banner have a measured increase in the number of premises connecting their buildings to the monitored fire alarm networks but not enough to justify a false alarm call increase of between 12% and 15% per annum.

So why the increase, CSIRO scientists have initially suggested that Global warming may be responsible but fire services think this is just a cop out to avoid the real problems with false alarm activations.

So where does the blame lie? It would be easy for fire services to place the blame on the industry but that in reality is unfair and somewhat off the mark, Governments tend to think local Government and regulators are the problem and yet others believe the buck stops at the certifiers who sign off on the system, and of course fire protection companies are pointing responsibility to the poor service and maintenance work done by non authorised and untrained staff.

Initially, I was one who blamed a number of the above culprits but to be fair I believe that there are a number of factors that govern and control the increasing problems that beset the false alarm incidence in Australasia. These are:-

1. The number of old style and redundant systems currently installed in buildings which still comply because of non retrospective building codes not outlawing them. Some of these systems are 20 years plus in age and spare parts and finding a technician that understands them is near impossible.
2. The environments the systems are installed in and the changing weather patterns that we are experiencing do have an impact on the way these systems work and how effective they remain during their life time
3. The difficulty in understanding so many different and variable products means you need a University Degree to fully understand the operation of many of the systems and of course as design companies move to limit access to the specifications of their systems the many technicians at the coal face have little chance of forecasting or foreseeing any problems.

4. The exposure of technicians to solid training and workshop testing has diminished over the years as industry schools and training have been scaled back meaning many technicians no longer receive training that gives them a good grounding in the industry
5. Understanding the environment and the elements that the system will be exposed to means that a system can be designed and installed to address these factors but where buildings usages are changed or varied or designed differently then systems perform differently and this makes what are good designed systems look and operate poorly in the wrong application.
6. Not having a "use by date" on systems is the biggest fault of Government regulators as this means that old systems will never meet current industry expectations.
7. Lack of understanding of the function and operation of systems by certifiers, Local Government and Fire Services means we can't in a technical manner, impart vital information to the industry that could assist them in better design and function of systems
8. And finally - the wide variance of cost and capability is not communicated to the potential owner of the building who is left with what can be a very cheap and nasty system that will not live or perform up to expectation. Obviously industry, must ultimately take the blame for this one as they are responsible for some absolute lemons that would be better used as boat anchors than fire systems designed to save lives

CONCLUSION

Until the industry as a whole take responsibility for the detection and suppression system as a whole and restores credibility in both the design commissioning and certifying of fire systems we will have a higher than expected false alarm outage from systems and until Fire Services, Regulators, Fire Companies and Governments accept responsibility for ensuring that each system must have an end life and meet minimum specifications to operate and meet industry and building owner expectations we will always have a false alarm industry that is thriving on our mistakes and misgiving, taking valuable earnings away from our industry.



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THE FIRE SERVICE: More Than Just Fighting Fires

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Introduction

The Minister for Building and Housing presented the keynote speech at last year's FIRE-NZ 2009 conference. In this speech he identified the need to, and indeed the Governments intention to "reduce regulatory and compliance costs through streamlining and simplifying the building controls process". Following on from this announcement, the Minister released in February of this year, a discussion document on proposed Building Act reforms.

As flagged, this discussion document seeks to amend the purposes and principles of the Building Act so as to provide clarity around the purposes and principles stated within it. In particular the review seeks to streamline the consent process for complex commercial building work.

Specifically noted in the discussion document, is the role of the Fire Service Commission or more correctly, the NZ Fire Service (NZFS). The general public are probably ignorant of the role of the Fire Service in this process. When they turn their mind to the role of the Fire Service they probably only think of a fire appliance thundering down the road under lights and siren. However, the need to respond an appliance means a wide range of proactive strategies has failed. Significantly, the implementation and success of these strategies involves either directly or indirectly, a wide range of organisations beside the fire service.

At the same time as the review of the Building Act, the government has set in motion the integration of the seven existing Auckland local bodies into one "supercity". This will probably be only the first of a number of "integrations" to occur.

The amendments to the Building Act and these reorganisations provide an ideal opportunity to reflect on what improvements can occur in the interaction of the various agencies and specifically how the fire service integrates its role with that of local government.

In this respect, opportunities exist throughout the life cycle of a building to influence the safety from fire of its occupants. The first place this opportunity occurs is at the design stage prior to the consent application process.

Current Design Methodologies

It is the authors contention that the current design methodology employed by the New Zealand construction industry has not changed with the advent of the 2004 Building Act. The 2004 Act specifically requires the submission of plans and specifications that demonstrate how the provisions of the building code are met. A significant proportion of the design documentation forwarded to the NZFS for advice during the building consent process lacks information on the most fundamental life safety aspects. Assuming fire safety designs are representative of the documentation submitted, this is very worrying. The poor quality of fire designs was identified in the

independent technical audits undertaken on designs submitted to the NZFS in 2006 and again in 2008. Unfortunately, in the interim period between both audits, little appears to have changed.

Many designers point to the late inclusion of the Fire Service in the consent process as bureaucratic and unnecessary red tape. They also berate the consent authorities for being "timid and indecisive". Again, a review of much of the documentation provided for consent indicates poorly described designs. The clarity and presentation of the fire design relies not on an obtuse regurgitation of the acceptable solutions within a fire report, the paint by numbers many fire engineers adopt, but in how comprehensive the conclusions of this report are translated into drawings and specifications. The successful installation of a life safety system requires the design output to be definitive to allow the range of trades involved to successfully implement the design. Many trades are involved in the provision of life safety systems and thus successful implementation requires information to be clear, concise and unambiguous. Drawings are the normal way of communicating these requirements in the construction industry, not reports.

The proposed introduction of definitive performance criteria within the fire framework may go some way to lifting the quality of fire design work. This, together with an overhaul of the current acceptable solutions, will also reduce the current reliance on the acceptable solutions by fire designers and allow general design practitioners to undertake straight forward projects.

Approval Process

Efficient and streamlined consent approval requires documentation to be clear, comprehensive and presented in a methodical manner. Design documentation that is incomplete or requires reviewers to hunt through scree'd's of un-indexed paper-work is time consuming and wasteful.

The author has attended many determination hearings where the number of lawyers exceed the number of construction industry representatives. Invariably, when it becomes clear the submitted design does not demonstrate compliance, both the building owners lawyer and the fire engineer take refuge behind the fact that the building was consented and thus must comply. They then infer if this is not the case, the onus and subsequent liability rests then with the Building Consent Authority (BCA). Whilst this needs to be tested in court, the debacle with the leaky building cases would seem to indicate that indeed when it all goes wrong, the BCA is left holding the liability.

These issues can be resolved relatively easily by each BCA upholding a minimum standard of documentation to allow lodgment. To this end the Department of Building & Housing have been working collaboratively with the Institute of Professional Engineers to define this criteria.

We are beginning to see a trend where the fire reports lodged indicate they are not for the purpose of demonstrating compliance with the Building Act, but to inform the other designers in the project of the various fire safety systems they need to provide. Where then does the liability lie if this document is then subsequently accepted as part of the consent documentation?

Building Compliance

The recent Raven case demonstrated how the Territorial Authority and fire service can work together. This case started with a Station Officer from Auckland City responding to what transpired to be an unwanted alarm having noted that the fire alarm was not sounding throughout the building. This was investigated by a fire safety officer who concluded the system had been incorrectly wired. This was confirmed by an independent inspector. The City was notified and following investigation, the fire alarm servicing agent was successfully prosecuted for falsifying a 12(a) warrant of fitness declaration. The resulting large fine and loss of his IQP status from Auckland City Council is hopefully a salutary lesson to others. This is a good example of two agencies (NZFS and Auckland City) working co-operatively.

Inspection Protocols

A fire protection industry sponsored study by the Building Research Association NZ (BRANZ) identified some serious deficiencies in the installation and maintenance of passive fire protection. This has motivated the training arm of the fire protection industry, Firetech, to develop some unit standards in the

inspection of passive systems. The development of these units will develop capability within a variety of sectors within the industry; including, it is hoped uptake by the building officials group.

This is a good example of how an identified weakness in the compliance regime can be rectified by utilising the combined strengths of the construction industry.

Data Sharing

The Fire Service and local bodies have both adopted the use of geographical information systems (GIS) as the main platform of data storage. This provides the opportunity to share information on a wide range of building related activities such as:

- Pre-design data such as the fire-fighting checklist
- Transfer of building consent applications
- Fire-fighting water classification and flow tests
- Hydrant inspections
- Building audit data
- Fire alarm connections

Conclusion

Many BCA's are now requiring pre-lodgement meetings to alleviate incomplete applications being lodged. To continue to influence the design and construction of fire safe buildings requires the proactive involvement of all sectors of the construction industry. The end result is to produce a fire safe building that is "fit for purpose". The main emphasis is to avoid the fire in the first place. The fire service mission sums this up well, "reduce the incidence and consequences of fire".

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Fire Systems at SKYCITY AUCKLAND

John Stevenson Grad. I Fire E.
Fire Safety and Risk Manager
Sky City, Auckland

Skycity Auckland is made up of 7 separate buildings, each having different levels of protection in line with the occupancy and use. Skycity has a wide range of fire protection systems, ranging from pre-action sprinkler systems, conventional panels right through to fully addressable state of the art panels and EWIS (Emergency Warning Intercommunication System) and in the New Year the EWIS at the casino will be upgraded to a new Honeywell IS200. There will also be a hot aisle gas flood system installed in our new server room.

The easiest way will be to look at each building on its own and describe the systems in each.

SKYTOWER

This iconic structure has been part of the Auckland skyline for over 12 years, and has been visited by many people over this period. The tower was designed by Craig Craig Moller, built by Fletcher construction and overlooked by the watchful eye of BECA, who still are regularly used in any changes or building works on the Tower and our other buildings.

The tower presented many unique problems from the fire protection and life safety perspective; these were overcome by the design team, NZFS, and Fire Engineers from BECA.

The tower has both active and passive systems and hand held fire fighting equipment in place to protect the Tower and the people who work and visit. The Tower has a refuge safe haven in the base of the pod. This level of the pod allows for evacuees

to safely evacuate the upper levels of the tower and remain in the lower levels in a purpose built evacuee refuge.

The Tower structural steel in the observation deck and other areas of exposed steel are coated with a passive fire resistant intumescent coating that adds to the fire rating of these structural components.

In addition to these the kitchens are also further protected with ANSUL-PIRANHA wet chemical systems.

ACTIVE SYSTEMS

Level 44

- 1 x MX4288 fully addressable
- 1 x Wormald DBA 3
- 1 x Fibre Optic driver
- 1 x Vesda covers the mast
- 1 x EWIS Q90
- 1 x SPINEX unit
- 1 x PC with colour graphics package

Plaza Level

- 1 x Wormald DBA 3
- 1 x BIC for sprinkler system
- 1 x BIC for hydrant riser system
- 1 x MX4288 fully addressable
- 1 x Fibre Optic Driver
- 1 x EWIS Q90
- 1 x PC with colour graphics package

Pump Room Level

- 1 x Hydrant riser diesel
- 1 x Hydrant riser electric
- 1 x Sprinkler diesel



- 1 x Sprinkler electric
- 1 x SPINEX unit
- 2 x 200 litre diesel fuel tanks

The entire fire alarm system can be controlled from the Plaza fire control room or from level 44 fire control room using the colour graphic PC system.

The sprinkler pump sets are designed with multi stage impellers which boost the incoming town mains supply of 900kpa at the eye of the pump to 2800kpa at the outlet; this ensures that there is sufficient water pressure at the last heads on level 64.

The hydrant riser pump sets are designed with multi stage impellers which boost the incoming town mains supply of 900kpa at the eye of the pump to 2800kpa at the outlet; this ensures that there is sufficient water pressure at the last riser outlet on level 61. The risers outlets below level 54 are fitted with pressure reducing valves (PRV) these valves reduce the pressure of the pump from 2800kpa to 1050kpa.

In 2008 the existing Wormald FP4000 fire alarm panels were upgraded to the latest advances with chip changes and reprogramming to bring them up to MX4428 versions.

Wormald NZ Ltd have been involved with The Tower since the design stage and installed the sprinkler system and fire alarm panels. Wormald NZ Ltd carries out all the servicing and maintenance of the systems installed in the Tower.

PASSIVE SYSTEMS

Sky Tower has the following passive systems installed:

Lift 4 (Service/Firemans Lift) & Stairwells

This lift is a fire cell and the entire lift shaft from below the floor of level 61 to the retail level (P3) has a rating of 120 minutes. The principal fire rating between floors is 120 minutes this same rating has been used on the shaft walls to provide fire separation between the occupied areas and the exit stairs and doors from the occupied space through the shaft wall.

The wall between the two (scissor) egress stairs are fire rated for 60 minutes.

The stair 3 between the lower observation level and refuge 3 is also rated to 120 minutes.

Each floor of the Sky Tower pod (level 44-60) is a separate fire cell. The Sky tower base retail area is also a separate fire cell.

The fire doors into the ducts on the stairwells are all fire rated to 60 minutes

All stairwells within the Tower are pressurised with outside air drawn in from below the refuge areas to minimise the possibility of smoke from a fire in the upper levels of the pod being drawn into the system.

The three refuge areas are fire rated at 120 minutes and can hold 844 persons in total.

PENETRATIONS

All penetrations in the Tower are sealed to AS4072.1 and maintained under AS1851:2005.

HAND HELD FIRE FIGHTING EQUIPMENT

The tower is also protected with fire extinguishers and fire hose reels located through out.

There are 106x5kg CO² extinguishers, located in the service ducts from top of the mast down to retail level.

There are 20x4.5kg ABE dry powder extinguishers located in the public. accessible areas from level 60 to retail level.

There are 4x7ltr wet chemical extinguishers in the kitchens.

There are 8x fire blankets in the kitchen areas of the tower.

There are 26x fire hose reels from level 60 to retail level.

SKY CITY FUTURE

The Sky City complex continues to place great importance on its fire safety and fire risk management systems and practices. Systems are assessed, maintained to compliance requirements and upgraded as required.

With my role and the practices I manage to ensure that the fire protection, fire alarm and passive fire systems support an integrated approach to fire safe and risk management for the Sky City complex, visitors and guests will continue to be assured of a wonderful experience in one of the safest building complexes in New Zealand.

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SPRINKLERS PROVEN TO PROTECT THE ENVIRONMENT

- ❶ The fire in the first living room, protected by a quick-response sprinkler, was called “all-out” shortly after the arrival of the hose crew.
- ❷ In the second living room, not protected by a sprinkler, flames can be seen in the window near the source of ignition.
- ❸ Attendees in the viewing gallery, as well as film crews and firefighters on the floor watch as flames engulf the second living room
- ❹ At the ten-minute mark, firefighters prepare to enter burning living room

The initial findings of a groundbreaking study show that home fire sprinklers protect the environment. The study, a collaborative effort of FM Global and the Home Fire Sprinkler Coalition, involved the burning of two furnished living rooms, one of which had been outfitted with a quick-response sprinkler.

At a January 19, 2010 press conference at the International Builders’ Show in Las Vegas, Christopher Wieczorek, PhD, a senior research specialist at FM Global, showed side-by-video of the rooms burning. Forty-four seconds after ignition, the single sprinkler head in the protected living room activated and began to fight the fire, while fire raged in the unprotected room. After five minutes, the fire in the sprinklered room continued to be contained, while in the unprotected room, every combustible item was burning.

After the test, FM Global compared the environmental impact of each fire, specifically:

- the types, quantity and duration of air and water pollutants released from a home fire

- water usage from fire sprinklers and firefighters’ hoses
- the environmental impact resulting from burning household furnishings and finish materials as well as disposing the fire-damaged contents of a home
- the carbon footprint associated with rebuilding a burnt home

Announcing the initial findings of the study, Dr. Wieczorek said that in the event of a home fire where sprinklers are present:

- the release of greenhouse gases (CO₂) are reduced by 99%
- the amount of water usage is reduced by 50%
- the amount of fire damage to the room is less than 3%, compared to a 100% loss in the unprotected room

Dr. Wieczorek added that the amount of materials burned by the fire that had to go into a landfill, and the amount of raw materials needed to rebuild after a fire were also reduced.



PASSIVE FIRE PROTECTION – Still As Important In A New Decade

Greg Baker
BRANZ

As we enter a new decade, Passive Fire Protection (PFP) continues to be a vitally important component in an overall building fire safety strategy and yet PFP often fails to attract the attention that it deserves. The most obvious examples of PFP in buildings are the fire rated floors and walls that define the different fire cells in buildings. But then there are the less obvious items such as fire doors, fire stopping of plumbing, drainage and electrical services, as well as fire rated coatings and fire dampers where HVAC ducting passes through a fire rated element.

Unless all these systems are correctly designed, specified, installed, inspected and maintained, then there is the possibility that the PFP systems may fail, thus compromising the fire safety in the entire building. It is often the case that a minor omission can lead to catastrophic consequences that far outweigh the relative magnitude of the PFP product and its installation.

The Fire Protection Association therefore continues to actively promote the highest standards amongst the many industry professional involved in PFP. And it cannot be understated the crucial role that Building Officials play in the successful delivery of PFP in New Zealand buildings.

Following on from the very successful full-day stream on fire protection at the 2009 BOINZ Conference in Christchurch, it is very encouraging to see that a section of the pre-lunch session on the Wednesday morning of this year's conference will be devoted entirely to PFP.

The PFP segment will consist of three separate presentations.

The first presentation entitled "Passive Fire Protection – The Current State of Affairs" will be given by Greg Baker, the chair of the FPANZ PFP Group. The presentation will give delegates a summary of the various initiatives that have

been underway since the publication in 2008 by FPANZ of research findings into the state of PFP in New Zealand buildings. The Department of Building and Housing has been working closely with Territorial Authorities/Building Consent Authorities to highlight the importance of PFP being inspected and maintained through the Compliance Schedule/Building Warrant of Fitness process. FPANZ has also been working with the Engineering, Food and Manufacturing Industry Training Organisation (Competenz) to develop a series of NZQA qualifications for the PFP industry, the first of which is expected to commence in the middle of 2010. In addition, FPANZ has set up a Product Listing Scheme which lists the PFP products that are available in the market.

The second presentation entitled "Fire Resistance Ratings and Compartmentations" will be given by Hans Gerlich – Hans has been Technical Manager Building Systems at Winstone Wallboards for the last 20 years and is widely recognised in the industry as a PFP expert. The presentation will address the philosophy of fire compartmentation and describe the role that PFP products and systems play in achieving effective fire compartmentation, as well as Building Code compliance.

The third presentation entitled "Openings Through Fire Rated Walls" will be given by Geoff Willis – Geoff brings a wealth of experience to this topic with over 30 years experience in the fire protection industry and is currently General Manager – Doors with Norfolk Building Products. Geoff is also the FPANZ expert nominee on the SNZ committee P4520 Fire-resistant Doorsets and Smoke Control Doors. The presentation will focus on fire and smoke doors and deal with a range of related subjects, such as the difference between Acceptable and Alternative Solutions, failure criteria in testing, how testing is conducted and compliance aspects.



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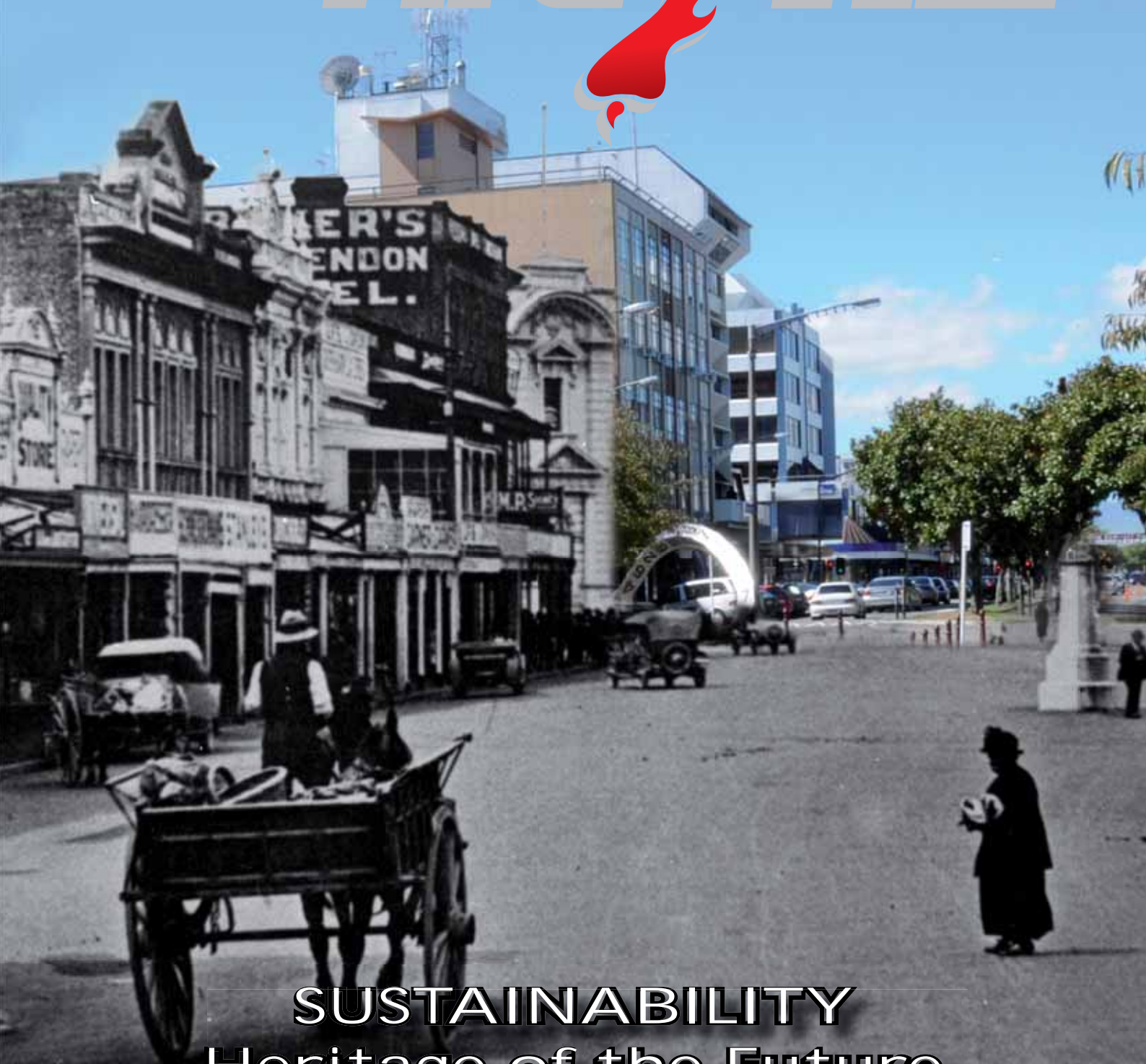
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Standards New Zealand and UPDATES/IN DEVELOPMENT

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IN DEVELOPMENT

Fire sprinkler systems for houses	<p><i>Committee:</i> P4517 Revision <i>Project Manager:</i> Erin Alderton <i>Estimated Publication Date:</i> May 2010 <i>Comments:</i> The Standard is being revised to emphasise its application to domestic occupancies only and to address design and installation issues that have been identified since publication. Any fire formal interpretations relating to NZS 4517 since it was last amended in 2003 have been applied during this project. The committee continues to refine the draft during the ballot phase of the project.</p>
Underground fire hydrants – Phase 1	<p><i>Committee:</i> P4522 <i>Manager:</i> Erin Alderton <i>Estimated publication date:</i> December 2010 <i>Comments:</i> Phase 1 of the project was a scoping exercise to obtain the expert technical committee's recommendation on whether to adopt BS EN 14339:2005 and BS 750:2006 for use in New Zealand, or to continue with the development of a draft prepared on behalf of Water New Zealand. The committee met on 5 November and the recommendation is to proceed with the draft that's been prepared for New Zealand conditions, to be further developed in the second phase of the project. The committee meets again in February to further develop the draft.</p>
Fire-resistant doorsets and smoke doors adoption	<p><i>Committee:</i> P4520 <i>Project Manager:</i> Jono East <i>Estimated Publication Date:</i> June 2010 <i>Comments:</i> The P 4520 committee met to review public comment submissions on 27 January 2010. The draft is currently being reviewed and amended in light of the comments received.</p>
Fire detection & alarm systems in buildings	<p><i>Committee:</i> P4512 <i>Manager:</i> Sonia van Ree <i>Estimated publication date:</i> August 2010 <i>Comments:</i> This is a limited amendment to NZS 4512:2003 taking into account formal interpretations and will ensure the Standard remains a dynamic document that adapts with the challenges and changes experienced by the fire protection industry. Public comment period commenced on 21 December and will conclude on 11 March 2010.</p>



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