

# **NEW ZEALAND FIREFIGHTERS**

Injured on the job or at the station

by

Dan Coward

Graduate Diploma Occupational Safety and Health

A distillation submitted for the thesis of

Occupational Safety and Health

Adelaide University

2004

## TABLE OF CONTENTS

|                    |    |
|--------------------|----|
| Introduction ..... | 3  |
| Argument.....      | 4  |
| Conclusion.....    | 10 |
| References .....   | 12 |

## *Chapter 1*

### **INTRODUCTION**

During the 12 months June 2001 and July 2002, career firefighters of the New Zealand Fire Service injured themselves 562 times. Based on international trends, the majority of these injuries should have occurred while attending some of the 60,000 odd emergency incidents that occurred during this period. What was not known is where the injuries actually took place, what type of injuries they were and did they in fact follow international trends of firefighter injuries.

The increased emphasis placed on firefighter injuries, the cost to an organisation and the need for senior management to both reduce the cost and frequency should place a need to research the area of firefighter injuries as a priority. Determining whether organisationally, the trends are similar with international trends and therefore receptive to international injury prevention strategies or unique to the operations of the organisation and country, would be highlighted if undertaken.

Despite the compounding reasons why research into this field should be undertaken, research internationally has been undertaken, but within the New Zealand Fire Service, it has been non-existent.

To effectively and actively want to reduce injuries to firefighters, significant research had to be undertaken into firefighter injuries. Evidence of research into the injuries does not exist on a significant level to make the reductions currently required achievable or sustainable.

## *Chapter 2*

### **ARGUMENT**

To want to reduce the injuries firefighters of the New Zealand Fire Service currently face requires a level of understanding of injury data. Additionally where the organisation lies with international trends is also key to adopting practices to reduce injury frequency. The emphasis on reducing injuries to firefighters stems from the New Zealand Fire Service Strategic 5 year plan<sup>1</sup>. Contained within the plan are the Health and Safety goals that are to be met by the organisations senior management. This is placed within the performance agreements that senior management have. Currently this calls for an accident frequency rate of less than 55/1,000,000 hours worked and a return to work within 40 hours target<sup>2</sup>.

The process utilised to determine this figure is unknown, yet if attained could save the organisation a significant amount. Injuries cost the New Zealand Fire Service close to a million dollars every year<sup>3</sup>. With a reduction of injuries to the organisation, clearly from a fiscal aspect, savings would be made.

To be able to achieve the reduction in costs, identifying what areas of the organisation injuries are occurring needs to occur. This aspect provides the basis for injury prevention strategies to be developed and introduced. In identifying specific areas that have a high frequency of injuries, changes could be made to those specific areas or tasks. Whilst cost associated with changes may be high in the short term, applying a reduction in injuries of X% to this specific area of injuries, the opportunity in forecasting what savings could occur could be undertaken. For example, if 19% of injuries were occurring on or in the fire appliances, by addressing some simple ergonomic factors such as wider steps, external lighting of the fire appliance, the costs associated in changing

---

<sup>1</sup> Fire Service Strategic Plan 2004-2009

<sup>2</sup> Source: New Zealand Fire Service Commission Business Plan 2004-2009

<sup>3</sup> Source: Claims Management Unit New Zealand Fire Service

fire appliance design could be offset by the savings made from the reduction of injuries. This approach was undertaken by the United Kingdom Fire Service in 1972 following an investigation into the types of injuries being recorded<sup>4</sup>. Changes were made to both ergonomic design and lighting of the fire appliance that resulted in significant reductions of injuries, highlighted by a comparative study that was undertaken in 1997<sup>5</sup>.

Clearly the emphasis placed on reducing firefighter injuries is fiscal focused as part of an overall management plan, yet the research required in identifying the nature of injuries and their locations as the foundation for any ensuring process adopted, but did not exist.

The research that has been undertaken over the past decade into the hazardous substances and environments that firefighters face has provided a decade of improvements to the personal protective clothing and equipment firefighters now have. Significant research exists in this field and noticeably has been acted upon. Recent introduction of a health-monitoring programme for employees of the New Zealand Fire Service was the result of several years' research involving medical professional, employee and management representatives<sup>6</sup> to continue the monitoring of exposures to the hazards identified.

What this highlighted was the lack of research that had been undertaken in the New Zealand Fire Service in relation to firefighter injuries. GMV Associates undertook a workplace analysis of firefighter injuries in 1999<sup>7</sup>. This was the first major study of firefighter injuries within the organisation and covered off two periods of time during the early to mid 1990s'. The purpose of this research was from a fiscal perspective with the leading objective being;

- *'Analyse the New Zealand Fire Service Claims history to assist in quantifying their risk to a private insurer'*

---

<sup>4</sup> Almond GH United Kingdom Fire Engineering Scholarship 1972

<sup>5</sup> Almond GH Report on accidents, injuries and illnesses to firemen in Great Britain 1997 Pg 23

<sup>6</sup> Source; Health Management Programme New Zealand Fire Service

<sup>7</sup> GMV Associates Analysis of workplace injuries: New Zealand Fire Service 1999

The research undertaken noted an overall trend downwards of the frequency of injuries. It was also the first indication that incident ground injuries were higher than those that occurred on station or carrying out routine activities. The research concluded that reporting systems were not accurate to validate the information further and recommended investment into future reporting systems. The end result was the privatisation of insurance for the New Zealand Fire Service until 2001 when legislative changes forced another change in managing injury claims.

The study undertaken by GMV associates was the only 'firefighter injury' based research that had been undertaken into the New Zealand Fire Service and contributed greatly to the development of Health and Safety within the organisation. Significant changes had occurred within the organisation since this research and the lack of recent research into firefighter injuries was a key element into the research undertaken. With the historic and international trends of injuries being incident ground based, the potential existed for future injury prevention programmes to be focused around this theory and not take into account all aspects of the data that exists. In addition, fuelling any preconceptions that firefighting is extremely hazardous.

From the research undertaken into existing international papers, a clear indication that firefighter injuries were significantly higher at the incident ground was established. This was firmly identified by researchers in the United Kingdom and United States. The National Fire Protection Association in America produced an annual report into the injuries firefighters suffered. Their reports during 1996 to 2001 showed the incidence rate of injuries still higher at the incident ground accounting for up to 68% of all injuries suffered<sup>8</sup>.

Findings from the United Kingdom during 1997 supported this trend with 56% of all injuries recorded against the incident ground<sup>9</sup>. Earlier research undertaken by the Fire Research and Development Group into firefighter injuries in the United Kingdom again showed 50% of injuries occurring at the incident

---

<sup>8</sup> Karter MJ US firefighter injuries 1996/1997 NFPA Journal v91 pg 66-77 Nov/Dec 1997

<sup>9</sup> Almond GH Report on accidents, injuries and illnesses to firemen in Great Britain 1997 pg 21

ground<sup>10</sup>. International trends were indicating a significant hazard in the occupation of firefighting, with 50% or more injuries occurring at the incident ground. Utilising accident/injury data held by the New Zealand Fire Service for 12 months during 2001 and 2002 to establish what frequency of injuries were occurring on the incident ground was undertaken to compare with the internationally identified trend of incident ground injuries.

What was identified were the injuries occurring at the incident ground accounted for only 28% of total injuries, with some 72%<sup>11</sup> of all injuries occurring on the fire station, or some other site carrying out non incident ground activities. This was in complete contrast to the trends identified and highlighted a need for further research into firefighter injuries, identifying where the incidences were, nature, contributing factors and their correlation to emergency incidents attended.

Only one piece of research linked the frequency of injuries occurring at an incident ground with the number of emergency incidents attended. This conclusion reached by the Fire Research Development Group was the only one identified, with comparisons of incident frequency and injury frequency within the New Zealand Fire Service showing no correlation.

The data selected from the New Zealand Fire Service was based upon legislative changes to both the Health and Safety in Employment Amendment Act 2002 and the Injury Prevention, Rehabilitation and Compensation Act 2001. With the significant changes to the legislation covering the reporting of accidents and the method of recording and managing injuries about to take place; the change in reporting programmes prior to 2000, a snap shot in time existed with the data held. The data held portrayed a picture different to international trends when discussing location of injury, but supported the nature of injury suffered by firefighters.

Identifying the nature of injury that firefighters faced internationally was aided by research undertaken in the United Kingdom and the United States fire services

---

<sup>10</sup> Marriot MD; Lillicrap DC Accidents to firefighters 1994

<sup>11</sup> Source; New Zealand Fire Service Human Resources Information Management System

into the nature of injuries. Researchers showed the most significant nature of injury to be sprains and strains. This was a view upheld with data held by the New Zealand Fire Service, and further supported by the Accident Compensation Corporation (responsible for the data of injuries suffered by all persons in New Zealand). On average 40% of all injuries that occurred to firefighters internationally were sprains or strains. This is irrespective of their location. With little research being undertaken into firefighter injuries in New Zealand, the opportunity to access the comprehensive resources for combating sprains and strains was missed. The Accident Compensation Corporation had identified nationally that the majority of all injuries that occurred across all vocations were sprains and strains, accounting for 40% of all diagnosed injuries<sup>12</sup>. With adequate research into the data held by the New Zealand Fire service, this would have been identified and the opportunities would have been offered.

The findings of the data held by the New Zealand Fire Service indicated the incident ground as being less hazardous than the station environment (from an injuries perspective) supporting the view held that significant research and resulting changes had arisen from the research into the hazardous environments and exposures firefighters face over the past decade. An increase in training standards, personal protective clothing, safety equipment and resources have reduced the frequency of injuries reported at the incident ground during the early 1990s (as reported by GMV Associates) than those reported during 2002/2002.

What this further pointed to was the lack of knowledge about the nature and frequency of injuries that are occurring whilst on station. The resources and money that is spent on improving or making significant changes to the station work environment from an ergonomic perspective as a result of researching injury frequencies, injury locations, nature of injury and contributing factors, is amiss.

---

<sup>12</sup> Source: Accident Compensation Corporation Annual report 2002

To reduce the frequency of injuries suffered by firefighters, research into the injuries must occur. Once trends have been identified, the treatment can begin through the introduction of injury prevention strategies. These cost money. How to justify expenditure, to determine what expenditure, what results are required to determine an acceptable margin of success, are all factors that are influenced by the data and knowledge held of the firefighter injuries. With little or no research being undertaken into the injuries suffered by New Zealand Firefighters, the potential impact on effective injury prevention is significant. An expenditure of \$150,000 into a poster campaign to target a specific area of risk may reduce the injury frequency by 10-15%. This will be an ongoing investment each year, as posters fade, the message becomes routine. An investment of \$1.5 million changing the design or task, may be costly in the short term, but may reduce injuries by 40-50% and will require little intervention in the future. Therefore the savings made over a greater period of time significant, but to be able to make these decisions, an understanding of the data is essential and a need for research a determining factor for this process.

The affiliation between the New Zealand Fire Service and fire services in the United Kingdom is strong. A number of personal protective clothing, fire appliances, practices and personnel have originated from the United Kingdom. The opportunity to review injury data and injury prevention strategies with a view to implement relevant factors exists due to the strong affiliation that is shared. With little research being undertaken within the New Zealand Fire Service, the opportunity to identify where common factors are shared between organisations provides a cost effective approach to mitigating or reducing the injury frequency and ultimately the costs associated. This did not exist. Through undertaking this research, highlighting to the organisation the information that exists can have an impact on the way we manage our data, utilise our data and ultimately reduce costs to the organisation.



### *Chapter 3*

## **CONCLUSION**

The New Zealand Fire Service is a government agency, and is funded from insurance levies collected. Therefore the expenditure of the organisation is under scrutiny from both the government and the public sector. This requires some responsibility in managing costs associated with injuries and injury prevention strategies. It is important for the organisation to show that they are managing the injuries effectively and responsibly, with an emphasis on reducing these costs. This also extends to the measures introduced to reduce those costs.

To effectively reduce the costs associated with injuries, a greater understanding is required by those responsible. An in-depth approach to injury management must extend more than the monthly reporting of new injuries.

The need existed within the New Zealand Fire Service to undertake some form of research into the injuries faced by firefighters, the nature of injuries, the location, body part, what existed about firefighter injuries and where this corresponded with international trends. Significant research already exists into the hazardous environments that firefighters are faced with and is reflected in the advances to date with personal protective clothing, equipment and practices.

One key factor identified is our limited knowledge and lack of research into our station work environment. Having identified a significant percentage of work based injuries occurring in the fire station, a need now exists to identify the common elements in these fire stations. Are the stations of the same era, building design, are the buildings themselves contributing factors. Is there a need to review the policies directing the refurbishment or rebuilding of fire stations. In identifying this element, future construction of work environments

can reduce the frequency of injuries and ultimately the costs associated to the organisation.

The research undertaken has highlighted to the organisation a need to:

- further research firefighter injuries beyond that of monthly reporting
- a need to address the station work environment through further research
- a greater need for sharing of information and resources to address the common themes of firefighter injuries throughout the international fire services

The need for research existed, the evidence collected and reviewed clearly indicated firefighting to be less hazardous than that of the station work environment from an injury perspective, international trends were different from those identified in the New Zealand Fire Services, further research is required if reducing firefighter injuries is part of the organisation's goals is to reduce both the injury frequency and severity, if not from a fiscal perspective, but a welfare issue.

## REFERENCES

- Almond, G H.** *Accidents, injuries and illnesses to firefighters in Great Britain.* / 1997 Fire Engineers Journal, v57 no189 (Jul 97) p19-24
- Fire Service Strategic Plan 2004-2009** (New Zealand Fire Service)
- GMV Associates Ltd.** *Analysis of workplace injuries: New Zealand Fire Service* Wellington: GMV Associates, 1999.
- Karter, Michael J; LeBlanc, P R.** *U.S. firefighter injuries: 1996 / 1997.* NFPA Journal v91 no6 (Nov-Dec 97) p66-77
- Karter, Michael J; LeBlanc, P R.** *U.S. firefighter injuries: 1997 / 1998.* NFPA Journal v92 no6 (Nov-Dec 98) p48-56
- Karter, Michael J; LeBlanc, P R.** *U.S. firefighter injuries: 1998 / 1999.* NFPA Journal v93 no6 (Nov-Dec 99) p46-56
- Karter, Michael J; Badger, Stephen G** *U.S. firefighter injuries: 1999 / 2000.* NFPA Journal, v94 no6 (Nov/Dec 2000) p41-49
- Karter, Michael J. ; Badger, Stephen G.** *U.S. Firefighter injuries : 2000 / 2001.* NFPA Journal, v95 no6 (Nov/Dec 2001) p49-54
- Marriott, M D ; Lillicrap, D C.** London : *Accidents to firefighters* / Central Fire Brigades Advisory Council, 1994.
- New Zealand Fire Service Commission Business Plan 2004-2009**