

# **WORK RELATED FATALITIES PREVENTION PROJECT**

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## **INTRODUCTION**

The Victorian WorkCover Authority (WorkCover) and VIOSH Australia at the University of Ballarat, are involved in a joint project known as the “Work Related Fatalities Prevention Project” (WRFP project). WorkCover funded both the initial twelve-month data gathering project, and the current three year prevention project. The Victorian State Coroner’s Office have also contributed access to resources and administrative support during this joint project.

The WRFP project seeks to analyse the factors that have contributed to work-related fatalities in order to identify priority areas for intervention development and evaluation. In some of these areas the project seeks to pilot and evaluate interventions strategies.

The first stage of the project began in August 1997 and ended in August 1998. It involved the extraction, merging and analysis of data from WorkCover and the Coroner’s Office to determine three priority areas. These priority areas were agreed in late 1998. During 1998 and 1999 the first intervention was developed, with the second and third areas scheduled for 2000 and 2001 (the project is funded until Aug 2001).

The aim of this paper is to report on recent progress of the “Work Related Fatalities Project”, and to generate discussion on the current preventative interventions.

## **METHODOLOGY**

The Work Related Fatalities Prevention Project extracted and merged data from three data sources covering the years 1993/94 to 1996/97:

- The Victorian Coroner’s Office<sup>2</sup> - ‘work related’ data was extracted using a text search engine to search inquest findings and other text.
- The Victorian WorkCover Authority – All claims made for work related deaths during this time period in Victoria were extracted.
- The Victorian WorkCover Authority – data from all investigations into work related deaths in Victoria during this time period were extracted.

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<sup>2</sup> The Victorian Coroner’s Office collects information on all ‘unexpected’, ‘unnatural’ or ‘violent’ deaths which occur in Victoria (or to Victorian residents) which includes work related fatalities. The collection of the data is a joint project of the State Coroner’s Office and the Victorian Institute of Forensic Medicine.

Cases of interest to the current study were further selected on the basis of significant 'work-relatedness', defined as follows :

**Any person who suffers a work related death from injury or disease:-**

- a) **which occurred while the person was either a bystander or was working for payment, profit or payment in kind (including purposes of work experience); and**
- b) **which occurred within the State of Victoria, to a Victorian resident, or which involved a contributory factor related to work in the State of Victoria.**<sup>3</sup>

A detailed methodology is provided in Batchelor et. al. (1999).

A total of 332 work related deaths were found using the above data and definition. A number of both quantitative and qualitative analyses were performed in order to determine priorities.

The following criteria were used:

- The cause of death contributed to one or more deaths in the period of study
- The underlying contributory factors/issues were clear or well known and could be broken down into reasonably discrete parts
- That there did not seem to be too many impediments to achieving some form of reduction in work related deaths/ injuries in the area
- That the area was not being addressed by any other internal or external major project.

Using the above criteria, a decision was made to focus on the prevention of fatalities related to three problem areas:

- **Tree felling fatalities**
- **Hydraulic related fatalities**
- **Falls from heights (trucks and their loads)**

## **RESULTS**

### **Tree Felling**

The following cases are typical examples of fatal tree felling incidents where the deceased was struck by falling timber:

- The deceased, a forestry worker, was felling a Messmate tree. As it fell, the Messmate tree brought down a rotten Peppermint tree that it was entangled with, striking the deceased.
- The deceased, a tree faller, felled a tree that struck other trees on the way down. Fifteen to twenty minutes later, he started stripping the fallen tree when a branch that had been hung up fell, hitting him in the head.

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<sup>3</sup> Each term is further defined in terms of inclusions and exclusions elsewhere. There is insufficient space in the current paper to allow full publication.

There were 15 deaths recorded in the years 1993/94 to 1996/97 that involved tree felling activities. Some of these were workers engaged in the tree industries (forestry, arboriculture and related), others were farmers, people in non-specific occupations. The findings suggest a high fatality rate of 104 deaths per 100,000 workers in the forestry industry. Data on the numbers of workers in arboriculture or related industries is unavailable and hence a rate cannot be calculated.

These results are supported by other studies in related areas, which have found similarly high rates of death in the forestry and logging industry. NOHSC (1998) found a rate of 97 deaths per 100,000 workers between 1989 and 1992 in Australia. Approximately two thirds of fatal incidents (64%) involved workers being struck by falling objects (ie trees, tree branches). The majority of forestry and logging deaths (59%) occurred to “tree fellers” and most deaths (73%) occurred during “felling or clearing trees” (NOHSC, 1998a).

### **Hydraulic safety**

The following cases are typical examples of fatalities involving hydraulics:

- The deceased, a mechanic, was working on a tilt-cabin truck (fully tilted). He was crushed between the engine and cabin when the hydraulic mechanism responsible for supporting the tilted cabin failed due to lack of maintenance and design problems.
- The deceased, a mechanic, was working on a tip truck when the hydraulics failed and the cabin fell, crushing him. Poor maintenance, equipment modification and lack of safe systems of work/training are implicated.

Failure of hydraulically operated machinery directly resulted in the deaths of six Victorian workers between 1993/94 and 1996/97. However, hydraulic failures have contributed indirectly to a number of other deaths.

NOHSC (1998b) reported 43 deaths involving hydraulic equipment between 1989 and 1992 (3.5% of all workplace deaths. Tip trucks and skid-steer loaders (bobcats) each accounted for 11% of incidents. The most common mechanism of death was being “hit by falling object” (35%). Common equipment problems included sudden equipment failures and slowly leaking hydraulics, while problems with design included absence of safety devices, problems with controls, and unstable jacks (NOHSC, 1999).

### **Falls from heights (trucks and their loads)**

The following cases are typical examples of fatalities involving falls from trucks:

- The deceased, a truck driver, had either fallen off or been knocked off back of truck (by wind). He had been picking up empty fertiliser bins from farmers with a tray truck and it appears the lid had blown off the bin he was transporting. The deceased had apparently fallen whilst trying to replace it. The deceased was alone at the time.
- The deceased, a truck driver/owner, was on a tray truck guiding the loading of wool bales (stacked 4 high), being placed by a front-end loader tractor. One of the bales had become wedged between the truck and the loader. The deceased has reached out to free the bale with a baling hook, subsequently slipping with the bale 4-5m to the ground.

There were 26 fatal falls from heights during 1993/94 to 1996/97. Three of these were in the transport industry (two of which were from trucks and/or their loads).

NOHSC (1998) reported that “falls” accounted for 15% (181 deaths) of all Australian workplace deaths between 1989 to 1992, second only to being hit by moving objects (35%). Almost all fatal falls were from a height. With regard to transport falls, 10% of falls from heights occurred to “plant and machine operators and drivers” – “labourers and related” (36%) and “tradespersons” (33%) accounted for the most falls.

Field, Kenningham, Larsson, and Lee (1999) reported on fatal and injury workers’ compensation claims from 1<sup>st</sup> December 1996 to 31<sup>st</sup> March 1998 for all claims coded as a ‘fall from height’. It found that transport and storage represented 12% of the falls claims analysed). Fourteen percent of the falls claims in transport were falls from greater than two metres (16 claims), while a further 10% (12 claims) were falls from ladders, and by far the largest percentage of falls claims were falls from less than two metres (76% or 90 claims).

## **INTERVENTIONS**

### **Tree Felling**

Tree felling related deaths were chosen for the first intervention. Both the forestry and arboricultural industries become involved. Focus groups were conducted, to investigate more closely the issues surrounding the hazards of tree felling from the perspectives of representatives of both the forestry and arboricultural industries. These focus groups were held in October/November 1998 and identified several issues that are contributing to deaths not only in the arboricultural and forestry industry but also among home-handly persons, and organisations such as the Country Fire Authority (CFA) and the State Emergency Service (SES).

The number and diversity of issues brought up by the focus groups prompted the development of an industry group called the “Tree Felling Safety Group” (TFSG). The aim of the TFSG was “to develop workable solutions / intervention strategies for tree felling hazards and assist in implementing and monitoring interventions”. That is, the group was developed to prioritise the issues identified by the focus groups and then draw on members’ industry experience to determine ‘workable’ solutions and intervention strategies.

The TFSG is made up of a range of representatives of forestry workers, arboriculture related workers and trainers, ‘urban tree workers’, local government workers, unions and WorkCover. Meetings commenced in early February 1999, and have been held regularly since then.

While fatalities occur across the range of tree felling activities, the various parts of the industry vary in terms of regulation, work methods, contracting procedures, and the like. While this created some initial problems, it was generally acknowledged that each sub-industry had commonalities in terms of job function and types of hazards, and that a co-ordinated intervention or set of interventions would be beneficial.

The TFSG made a decision to focus attention on workers in the arboriculture and forestry industry where exposure to risk is high. Prevention strategies for workers such as farmers and home handy-persons are to be investigated later.

The TFSG produced a set of draft recommendations in August 1999. For the purposes of consultation with as wide a range of industry representatives as possible, seminars were held in six regional areas (MaryVale, Benalla, Ballarat, Colac, Orbost and Healesville) plus Melbourne, in August and September 1999. The seminars provided the TFSG with a better understanding of industry's views on priority issues and assisted to canvass the draft recommendations with industry.

The TFSG seminars were overwhelmingly successful, with over 500 participants attending the 7 sessions. Feedback was positive, and the priority issues for the industry were identified and incorporated in to the TFSG final recommendations, which was presented to the Work Related Fatalities Project Reference Group (the project steering committee) in December 1999. The document made a number of recommendations regarding fatigue, licencing and enforcement, codes of practice, awareness campaigns for the general public, and improved accident data collection (TFSG 1999). These final recommendations also included some 'points to watch' for future action, including farm forestry/agro-forestry, CFA/SES workers issues, and the continuation of the TFSG to look into issues of tree felling by farmers and the "do-it-yourself" area.

WorkCover has expressed support for the TFSG intent to address fundamental issues such as systems of work, management of contractors, provision of suitable guidance material for the industry, competencies and emerging issues. WorkCover is committed to working with the TFSG to develop an agreed strategy that incorporates many of their recommendations including research into fatigue and a likely review of the Code of Practice for Safety in Forest Operations.

### **Hydraulic Related Deaths**

Hydraulic related deaths are not a high frequency event. However, the area is one where there is a definable piece of equipment (that is, hydraulic hoists) and where there is already much known about potential solutions, although they appear under-used. It was therefore considered suitable for a prevention project.

Consultation with hydraulic hoist manufacturers and fitters provided the project with more information about the hazards, potential solutions and a better idea of the industry framework. It appears that pressure loss (through failure of hoses/hose clips or ram/piston failure), although it is seen as a rare event, is fairly well known in this industry. Pressure loss may lead to rapid descent of equipment such as tip trays, front end loader buckets, and other heavy equipment. Some industry representatives were aware of fatalities in the area, although most associated hoist failure with injury and near-misses. It is worth noting that all of the fatalities included in the study occurred once the machinery was actually being used (that is, none occurred during manufacture / fitting of hydraulic equipment) perhaps due to different task requirements.

In terms of industry structure, there are three distinct groups: hydraulic hoist manufacturers (those who manufacture hoist systems or parts of hoist systems); hydraulic fitters (those who

build component parts of hoists onto the equipment); and those who own/use hydraulic equipment. As all of these groups are inter-dependent, it was felt that the best chance of success came from intervening at all levels, with particular emphasis on hydraulic fitters who were able to influence all other groups. Hydraulic fitters appear to be competitive in terms of price, however, it may also be a benefit if the intervention is seen as something that could improve market share.

Solutions to the problem of rapid, uncontrolled descent of equipment do exist. However, the cost may be a dis-incentive to application and little evaluation work has been done on devices that have been imported into Australia.

OSHA in the USA made controlled descent devices mandatory for a range of hydraulic plant some years ago. This was specifically to avoid loss of pressure/hose breakages problems. Unfortunately, there does not seem to have been any evaluation work done on whether this has had any effect on injury/incident patterns.

The Victorian Plant Regulations do not explicitly mention controlled-descent devices or similar. However, the Victorian Plant Regulations do provide legally binding directions regarding the need to, as far as is *practicable*, identify, assess, and control risks. Moreover, the issue of practicability relies partially on the state of knowledge of the industry regarding available hazard control measures. Australian standards (whether they are 'called up' in the Plant Regulations or not) are usually a good indication of the state of knowledge.

Australian Standard AS 1418.8 1989 Section 4 Tip Truck Hoisting Systems 4.3.5(b) Safety Features is not called up in the Plant Regulations, but nonetheless requires "Safety device(s) to protect against the effects of failure of a hose in any support circuit on a hoisting system." (Standards Australia, 1989). The industry shows little knowledge or application of AS 1418.8 1989, and there is some confusion amongst hydraulic hoist fitters over whether Australian Standards are legally binding. It is intended that the current project will address this issue, and it may be beneficial for WorkCover to consider clarifying the legal status of Australian Standards to a wider audience.

The WRFPP project is exploring ways to increase the use of these controlled descent devices through *increasing awareness* of the benefits of controlled-descent devices amongst customers and manufacturers. Work will also proceed with hydraulic fitters to educate them on the *benefits of fitting* these devices to meet their obligations under the OHS Act (Occupational Health and Safety Act 1985, Victoria).

The project will evaluate the effectiveness of these interventions and make recommendations accordingly.

### **Falls from Heights**

Falls in the construction industry and falls in the transport industry, mainly from trucks, emerged as potential areas for intervention, especially from data collected by Field, Kenningham, Larsson, and Lee (1999). There are a number of falls projects that have recently

been commenced in Victoria, focussing particularly on the construction industry.<sup>4</sup> A decision was made to avoid 'overlap' and thus the project intends to focus on falls from trucks, targeting transport and storage workers in Victoria, with the possible selection of sub-groups by industry or geographical location.

Currently the project is gathering data about the particular hazards associated with work on different types of trucks. During January/February 2000, it is expected that the current project will attempt to further define the scope of the intervention, after looking in some detail at areas such as 'car-carrying' trucks, 'livestock carrying' trucks, bulk material trucks, tanker trucks and all truck types that require 'tarping down'.

The project will test the use of existing industry organisations to disseminate information and increase uptake of solutions. One option being considered involves the Transport Industry Safety Group (TISG), a group consisting of representatives of the Transport Workers Union, the Victorian Road Transport Association (VRTA), the Bus Association of Victoria, Victorian WorkCover Authority, Monash University Accident Research Centre, VicRoads and the Victorian Police. It is hoped that the TISG, as a widely recognised industry body, will assist the project in defining the problem, raising awareness of the problems with transport drivers/operators and companies, and assist in increasing uptake of appropriate solutions by industry.

## **SUMMARY**

The Work Related Fatalities Prevention Project (WRFP project) began in August 1997, collecting data from the State Coroner's Office database, the Victorian WorkCover Authority's compensation claims database, and the Victorian WorkCover Authority field operator's database for the years 1993/94 to 1996/97. Three priority areas were chosen after analysis of this data: tree felling fatalities, deaths involving hydraulic equipment and falls from trucks and their loads.

There were 15 tree felling fatalities over this period, in forestry, arboricultural and urban tree work industries. A group of industry representatives (including relevant unions and WorkCover) known as the 'Tree Felling Safety Group' (TFSG) was convened to develop recommendations for prevention work in these areas. The TFSG presented draft recommendations to industry in a series of seven regional seminars, the outcomes of which were integrated into a set of final recommendations that was presented to the WRFP project steering committee in December 1999. WorkCover is working with the TFSG to develop an agreed strategy that incorporates many of their recommendations including research into fatigue and a likely review of the Code of Practice for Safety in Forest Operations.

Deaths involving hydraulic equipment totalled six between 1993/94 and 1996/97. However, the area was felt to be suitable for prevention work as there is a definable piece of equipment (a hydraulic hoist) and a well regarded solution (controlled descent devices). The main thrust of the intended intervention is to liaise with hoist fitters (those who fit component parts onto the

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<sup>4</sup> The 'Foundations for Safety' project, involving the Monash University Accident Research Centre (MUARC), the Victorian WorkCover Authority, and other relevant industry organisations aims to identify blackspots in the construction industry, determine the underlying causal factors and develop and implement suitable counter-measures.

truck equipment) in order to influence manufacturers of hoists (their suppliers) and owners/users of hydraulic equipment (their customers), increase awareness of the problems of hydraulic hoist failure, and to increase uptake of known solutions (such as controlled descent devices).

There were 26 fatal falls from heights during 1993/94 to 1996/97. Three of these were in the transport industry. National statistics and injury claims data indicate a higher percentage of injuries from falls from trucks and their loads. The project will target transport and storage workers in Victoria, with the possible selection of sub-groups by industry or geographical location. The project will test the use of existing industry organisations to disseminate information to increase uptake of solutions that are already present within industry.

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