

THE ACCIDENT REPORTING SCHEME: WHAT HAPPENS TO THE DATA AND WHY

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Figure 1 - Accident

SUMMARY

This report demonstrates the importance of the Logging Industry Accident Reporting Scheme (ARS) for identifying problem areas and monitoring appropriate interventions. Two examples are used (cut-resistant legwear and high visibility clothing) which clearly show the effectiveness of this process.

CONCLUSIONS

- The ARS is an important injury prevention tool.
- The ARS has shown that initiatives taken by the New Zealand forest industry have

been effective in reducing the number of accidents occurring in specific areas.

RECOMMENDATIONS

- That forest companies and contractors place a high priority on supplying accident reports to the ARS.
- Great care must be taken to ensure that all accident reports are accurately filled out and contain all the relevant information.
- Report all accidents, including minor and near miss accidents.

INTRODUCTION

In order to improve accident statistics, it is essential that quality information on the frequency and cause(s) of industry-based accidents be collected. The collection of quality accident information specific to the New Zealand logging industry first became an issue in 1980, when a group of consultants were contracted to develop safer felling and delimiting techniques for New Zealand conditions. They requested that LIRO provide them with information on felling and delimiting accidents [1]. At that time, only limited information was available which was typically restricted to the larger individual forest companies [2]. Clearly, there was a need for a comprehensive database that contained up-to-date information on the number and type of accidents occurring in the New Zealand logging industry.

Accordingly, in 1981 a voluntary pilot logging industry accident reporting scheme was established in the Central North Island of New Zealand. The scheme was administered by the Logging Industry Research Association (LIRA) (The Association's name was changed to LIRO in 1991). Following the regional pilot scheme, the voluntary Accident Reporting Scheme (ARS) was extended to cover the whole of the country. At the completion of the 1994 calendar year, the ARS contained over 4,400 accident reports, consisting of 57 fatalities, 3,084 lost time (an accident which causes a worker to miss the next scheduled full day's work), and 1,300 minor (less than one day lost work) and near-miss accidents (an injury could have resulted but in this case it did not).

When an accident occurs within the logging industry, a report is filled out and the forest company or contractor sends this report to LIRO for inclusion in the ARS. The information from the ARS is analysed and summarised quarterly, and a one page flier containing this information is sent to all LIRO members and other relevant parties. A more comprehensive report is produced annually [3], and contains accident trends, information on accident type, severity, and frequency.

Information from the analysis of these trends highlights problem areas. Research can then be targeted towards these areas in an attempt to find the cause(s) of the accidents and propose methods to prevent a recurrence. This process provides the focus for much of the human factors research conducted by LIRO.

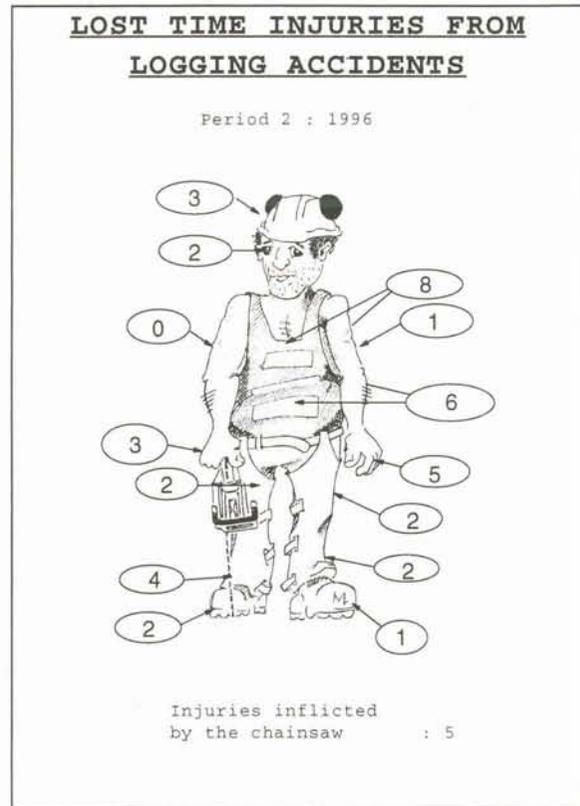


Figure 2 - One page flyer

Two case studies are presented in this report which illustrate how the ARS has been used to identify injury patterns, propose interventions and subsequently monitor the effectiveness of the intervention.

CASE STUDY 1 - CUT-RESISTANT LEGWEAR

In 1980, 41% of all lost time accidents were chainsaw cuts to the leg [1]. At this time there was no cut-resistant legwear produced in New Zealand, and import restrictions prevented suitable garments being brought into the country [4]. Therefore, LIRO, in conjunction with the logging industry and equipment manufacturers, set out to develop suitable garments.

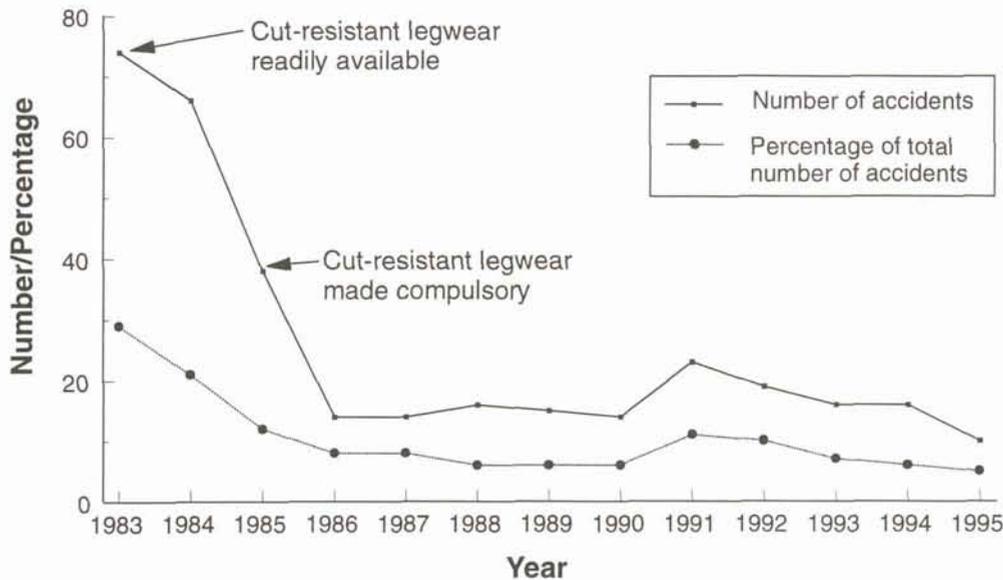


Figure 3 - Chainsaw cuts to the leg - 1983 to 1995

By 1982, the first locally made garments were on the market. By 1983, cut-resistant legwear had become readily available in New Zealand. At this time, chainsaw injuries to the leg accounted for 29% of the total number of reported accidents. This prompted LIRO to recommend the use of cut-resistant legwear [5], and by 1985, the wearing of cut-resistant legwear was compulsory for every chainsaw operator working within the New Zealand logging industry [2].

Figure 3 illustrates the proportion and number of all lost time accidents that were chainsaw cuts to the leg. This shows an initial dramatic decline from 1983 where chainsaw cuts to the leg accounted for 29% of all reported accidents, to 1986 where this figure was only 8%. The principal cause of this reduction in chainsaw injuries to the leg is thought to be the use of cut-resistant legwear [6].

Figure 3 shows that since 1986 the number of chainsaw cuts to the leg as a percentage of all injuries has fluctuated between 5% to 11%, but has not fallen below this level. One reason for this is that cut-resistant legwear is designed to prevent an injury when the chainsaw is producing a chain speed of 20 metres a second (m/sec). Most chainsaws can exceed this speed. Another potential reason is the possible deterioration in the protective qualities of the

legwear over time [2]. As a result of this, LIRO began research into the effective life of cut-resistant legwear [7]. Despite the fact that many loggers wear their cut-resistant legwear for well over a year, the study found that after six months' usage, the legwear no longer provided the level of protection required by the New Zealand Standard [8].



Figure 4 - Cut-resistant legwear prevented injury

CASE STUDY 2 - HIGH VISIBILITY EQUIPMENT

Analysis of ARS trends indicated that another area in need of attention was that of worker conspicuity (ability to be seen) within the forest environment. "Not seen" accidents (the worker

was not seen) were primarily of concern not because of the frequency of their occurrence, but because of the severity of the resulting injuries. For example, in 1991 there were 10 "not seen" accidents reported to the ARS. These consisted of two fatalities and eight lost time accidents. The eight lost time accidents had an average of almost 32 days off work as a result of the injury [9].

Logging workers traditionally wear dark clothing [10], since the harsh nature of most logging tasks quickly discolours lighter coloured clothing. This can make it hard for the operators of logging machinery to distinguish other workers from the forest background, which consists of many light-dark contrasts. With this in mind, LIRO set out to determine which colour(s) would assist operators in quickly locating co-workers and consequently reducing the number of "not seen" accidents [9].

Ten subjects volunteered to perform 10 trials each on a demanding central tracking task (designed to simulate operating logging machinery) while peripherally searching colour slides (designed to simulate scanning the area to locate co-workers) for various coloured test shirts displayed on a forest background. A head-mounted Eye-Tracker was used to track

subjects' eye movements to show which test shirts were detected and in what order [9].

The results showed that fluorescent lime/yellow, white and fluorescent orange were the most conspicuous (easily seen) colours, with fluorescent lime/yellow being the most highly visible against the pine forest background. This research led to LIRO recommending that all forest workers wear fluorescent lime/yellow high visibility garments. By 1993, most of the New Zealand forest owners required high visibility safety helmets and upper body garments be worn by all people working in, or visiting, their forests.

Figure 5 shows the percentage of all reported lost time accidents that were the result of the injured worker not being seen. The initial rise in the number of reported "not seen" accidents is probably due to an increase in the number and accuracy of accident reports entered into the ARS. After the adoption of high visibility equipment, the percentage of "not seen" accidents was dramatically reduced to the point where none were reported for 1995. As the dramatic reduction occurred straight after the introduction of high visibility equipment, it would appear that the use of high visibility equipment was the main cause of this reduction.

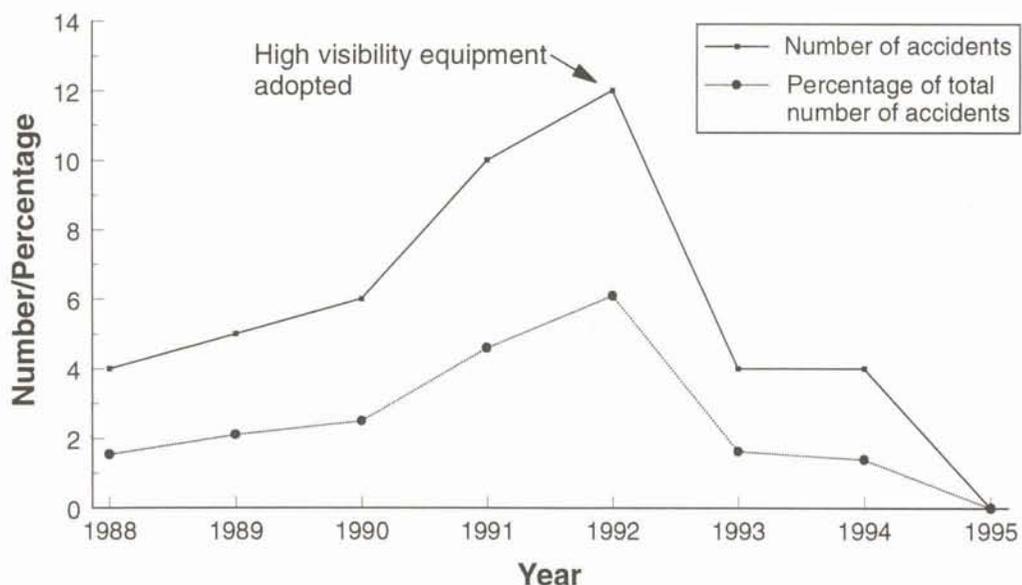


Figure 5 - Number and percentage of all reported accidents that were "not seen"



Figure 6 - Logger wearing high visibility equipment

DISCUSSION

The two case studies illustrate why the ARS is an essential tool for the improvement of safety within the New Zealand logging industry. The detailed information supplied to the ARS allows research, development and training resources to be targeted to the areas of greatest need. The effectiveness of this targeting is illustrated by the widespread acceptance and the relatively fast implementation of LIRO research findings by the industry. The ARS is particularly effective due to its defined forest industry focus. The collection of data for a wider group could potentially hide important accident trends, as well as the impact of interventions.

As the contractors and forest companies voluntarily provide the ARS with accident reports, it is difficult to assess the coverage of the scheme. That is, what proportion of the lost time accidents that occur in the New Zealand logging industry are being reported to the ARS. Although no research has measured the coverage of the ARS, as all of New Zealand's major forest owners are members of LIRO, coverage is thought to be high.

Minor injuries and near misses are also reported to the ARS. Although it is thought that only a small proportion of the total number of minor injuries and near misses are reported, they provide valuable information on circumstances where protective equipment and/or training has prevented injury or reduced

the severity of the injury. An additional function of the ARS is to provide information to manufacturers of protective equipment, who can make design changes where necessary. Design modification is an ongoing process, with LIRO acting as the information link between the user and manufacturer.

LIRO research findings can also affect legislation. Once LIRO research findings have been widely publicised, one forest company may adopt the intervention. Following this, other forest companies will see the intervention working and may also adopt it. Once the industry has accepted the intervention, it will then be written into the appropriate code of practice. This process has occurred with protective legwear and high visibility equipment, which has now been added as a requirement in the newly revised Code of Practice (Safety Code for Forest Operations - Part 3 Logging).

Due to the success of the ARS in the logging sector of the industry, in 1991 the ARS was expanded to include accidents occurring to workers in forest tending operations (forestry). The forestry accident trends are summarised yearly, as is done with the logging sector. Currently, LIRO conducts little research in the forestry area. The forestry ARS is still very much in its infancy and the value of the information contained within it is only now beginning to be realised.

In 1996, the ARS was further expanded to include the transportation sector of the forest industry. With the assistance of the transportation sector, this part of the ARS will allow the targeting of research and training resources to the areas of greatest need.

The ARS has only worked, and continues to work, because of the high level of support it receives from the New Zealand forest industry. This support is not only evident in the provision of accident reports to the ARS, but is also in relation to the extensive opportunities to carry out research within the New Zealand forest industry and in making possible the participation of their workers.

CONCLUSIONS

- The ARS is an important injury prevention tool.
- The ARS has shown that a number of the initiatives taken by the New Zealand forest industry have been effective in reducing the number of accidents occurring in specific areas.
- The ARS will only continue to work effectively if it is provided with accurate information on the number, type and causes of accidents. If inaccurate or inadequate information is provided to the ARS, inaccurate or inadequate interventions will result. The main reason for having the ARS is to find out where problems are so that we can effectively solve them.

RECOMMENDATIONS

- That forest companies and contractors place a high priority on supplying accident reports to the ARS.
- Great care must be taken to ensure that all accident reports are accurately filled out and contain all the relevant information.
- Report all accidents, including minor and near-miss accidents.

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