

Characteristics of Safety Successful Logging Contractors

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Summary

New Zealand logging contractors were asked about aspects of their safety management. The characteristics identified in the safety literature as being appropriate and beneficial for successful safety management, were demonstrated by the "safety successful" logging contractors surveyed in this project.

Contractors highlighted communication, management commitment and placing importance on safety relative to productivity, as being important in their safety management approach.

"Safety successful" contractors reported a perception that the application of good safety management resulted in increased productivity too; those not in the safety successful group who were also surveyed associated improved safety with static or poorer productivity.

"Safety successful" contractors provided benefits to their employees in the form of equipment, protective gear and perks such as hi-viz tops, production bonuses, grocery vouchers and nights out. Means of rewarding safe practice could be further explored, to offer contractor
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ntive costs and dilemmas.

The New Zealand forestry industry as a whole has financial, moral and legal requirements to continue actively addressing safety. Both forest companies and contractors may benefit from evaluating and addressing any perceived or existing communication or responsibility concerns between them.

It would be beneficial for the industry to consider means of addressing injury prevention through positive enforcement of proactive safety management programmes as opposed to evaluating safety performance based on numbers of reported injuries.

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Introduction

Forestry, especially harvesting, is recognised in New Zealand and elsewhere as a hazardous industry, with an injury rate higher than many other occupations (Poschen, 1993; Gibson, 1994; Johansson and Strehlke, 1996). The Occupational Safety and Health Service of the Department of Labour (OSH) have indicated that a forest worker is seventy times more likely to be killed on the job than the average New Zealander (Bradford, 1997). In addition to the human cost, there is a considerable financial burden, with conservative estimates showing injury to forest workers in 1996 cost the industry \$29 million (Cummins, 1997).

Improved health and safety management has been acknowledged as responsible for reducing costs and improving business profitability (HSE, 1996). The cost of occupational injury has been expressed in terms of direct and indirect costs (Klen, 1989) but also encompasses intangible social costs such as reduced worker morale, increased equipment downtime and increased replacement and training costs (Johansson and Strehlke, 1996).

Safety Successful Employers

The published safety literature has highlighted the role of a number of factors which contribute to the success of companies with respect to safe practice and performance. Important amongst these are management commitment to safety, supervision and leadership skills and safety communication.

Management commitment is an important factor for successful safety management which can be demonstrated through, for example, high priority given to safety in meetings, high ranking of safety officers and personal attention by managers into safety issues and investigations (Cohen, 1977). Strehlke (1996) observed that accident frequency and severity remained at high levels in spite of accident prevention campaigns, until management levels were also targeted for training.

A study carried out by Sluss (1992) identified effective management skills as being critical among "safety successful" contractors. These were contractors who maintained higher levels of production and lower accident frequencies than other contractors with similar harvesting systems and crew size and were also "better than average" in terms of their safety record. The "safety successful" contractors demonstrated a strong management commitment and safety-conscious attitude, resulting in their ability to maintain low injury rates.

Level of supervision and style of leadership and communication are critical to managing a safe operation. The APA (1982) describes leadership characteristics that help promote team work among forestry workers and Rothwell (1998) noted that leadership is an important organisational factor affecting perceptions of the work climate, as the leader helps create what an individual feels about a work environment. Managers can use very different but effective leadership styles, for example by use of positive reinforcement or incentives for good practice. Peters (1991) in his paper discussing the strategies for promotion of self-protective employee behaviour, describes methods to encourage safe behaviour, which include use of incentives, disciplinary actions, fear messages, behaviour modelling and employee surveys.

Good communication was highlighted by Bentley and Haslam (1999, in press), whose survey of managers within the postal industry indicated that those managing offices with lower accident rates had a higher standard of safety communication than the higher rate offices.

Regular communication between crew and contractors on safety issues was recommended by a training needs analysis study carried out in the forest industry (Moffat, 1998)

Desirable Safety Management Characteristics

The "safety successful" study, by Sluss (1992), attracted interest from New Zealand forest company personnel, forest contractors, and the contractor representative organisation (FCANZ), by identifying characteristics common to contractors who exhibited a "better than average" safety record. The study found that there was no "one" key characteristic associated with safety. Instead, safety was found to be only one part of their total business operation, so was integrated into overall management. This reinforces the findings from previous research.

Summary of characteristics associated with safe and successful crew management:

- Visible contractor commitment to safety, with positive feedback and praise for employees when they choose safe behaviours
- Careful selection of workers, with consideration of previous experience or recommendations and attitude to safety and of crew dynamics
- Promotion of teamwork and rapport, with concern for the individual
- Regular communication between crew and contractors on safety issues
- Having safety as an integral part of the operation rather than separate, so encouraging a strong safety climate within the crew, putting safety as a high priority relative to production
- Self-confidence, and hard working with an ability to learn from mistakes and to plan for the future
- Ability to effectively identify hazards and apply safe systems of work
- Ability to simplify safety and improve continuously
- High levels of mechanisation, good equipment and maintenance
- Appropriate safety gear and personal protective equipment, and encouragement of its use
- Ability to lead by example, to take responsibility and also to delegate responsibility
- Thorough accident investigation
- Regular worksite visits, or day to day involvement in the work

Project Objectives

This study was exploratory in nature, and aimed to determine the presence of the above characteristics within a group of "safety successful" logging contractors. Highlighting desirable characteristics will allow promotion of the positive characteristics within the industry, and illustrate aspects which could be further addressed. Further study will be able to establish how evident these characteristics are among New Zealand contractors, allowing specific targeting of educational management programmes.

Acknowledgements

The researcher would like to thank all those contractors who took time to answer the questionnaire, and those who also participated in interviews. Thank you also to the forest companies and key suppliers who helped establish the sample of participating contractors - Ernslaw One Limited, Juken Nissho Limited, PF Olsen and Company Limited, Pan Pac Forest Products Limited, Rayonier New Zealand Limited, Timberlands West Coast Limited, Weyerhaeuser New Zealand Inc, Wenita Forest Products, Professional Harvesting Systems, Core Contractors, BKC Forestry Services and Central Bay Logging Limited. The Foundation for Research and Technology funded this study through the Public Good Science Fund.

Methodology

Design

A survey questionnaire based upon that used by Sluss (1992) was used. This included general crew information, aspects of managing the operation, and opinions on safety management.

Table 1 indicates the main areas covered by the questionnaire. The survey was pilot tested with the help of representative contractors, FCANZ, OSH and company safety personnel. Following data collection from the questionnaires, a selected group of contractors was interviewed by telephone to provide additional data to support the questionnaire findings.

Table 1: Questionnaire content

Information area	Specific information sought		
The Operation	Crew details – ages, main job in crew, length of time working with the contractor	Type of system, production levels, number of crew carrying out various tasks (e.g. skidder operators, logmaker etc)	Contractor details, including age, education, experience in the industry and as a contractor
Management and selection	Methods of finding and selecting workers, crew qualities sought by contractor	Hours worked, types of pay and reasons; benefits offered to crews	Turnover and sickness or absence of crew
Accidents and injury	Number of Lost Time Injuries (LTI) ¹	Actions implemented to reduce injury rate	Effect of injury on production, turnover, equipment costs, morale and reputation
Training systems	Types of training, delivery and follow-up		
Supervision	Level of supervision, relationship with crew	Effect of safety on crew	

¹A Lost Time Injury is defined as one that results in the loss of (at least) one full working day following injury. An explanation of this definition, which applies to the national industry Accident Reporting Scheme (ARS), was included in the survey questionnaire.

Data Collection Procedure and Analysis

A cross section of 118 logging contractors was surveyed who were of variable size of operation, locations and harvest systems. Follow-up letters and questionnaires were sent out to all non-respondents to encourage their participation after three weeks and again after six weeks. After the initial data were gathered and initial analysis undertaken, a randomly sampled selection of 6 "safety successful" contractors was interviewed by telephone using a semi-structured question schedule. The questions were open, and targeted contractor opinions on factors that either hindered or helped their operation run safely and productively. Descriptive analysis was carried out using Microsoft Access and Excel 97.

Results and Discussion

Safety Successful Contractors

In total there were 38 usable and complete questionnaires returned, a response rate of 32.2%. Crew characteristics of all respondents are shown in Table 2, with variable crew sizes and geographical cross-section resulting in a wide range of production rates. As the project aimed to study "safety successful" contractors, characteristics of those who reported no Lost Time Injuries (LTI) for a specified 12-month period were analysed to produce the following results.

Table 2 General Crew Characteristics

		Range	Average
Crew size		3 to 20 men	8.3 men
Productivity	Ground based	90 m ³ to 350 m ³	204 m ³
	Cable	180 m ³ to 800 m ³	324 m ³

Organisational Management and Methods of Payment

A working week of 40 to 45 hours was reported by 50% of the group (10/21) with the remainder ranging between 47 and 60-hour weeks. 11 contractors reported use of an hourly rate of pay as the main method of payment, and the most common reason for choice of payment (whatever that choice was) was that it was deemed fairer to the worker. This concurs with the findings from Sluss (1992), who reported that an hourly rate was also most commonly used and that contractors described a potential risk to safety and equipment when pushed by production goals. The majority either give production bonuses or benefits in the form of gear, or allowances for either chainsaw and or tools, or safety gear. Half the group provided wet weather gear. Other additional benefits offered included travel to and from work, training, subsidised health care, crew outings and employee of the month awards.

Training and Supervision

All the group described having a "good" or "excellent" relationship with their crew, and 90% of them described their crew as having a "good" or "excellent" attitude to safety. The level of supervision is shown in Figure 1, with two thirds of the group of "safety successful" crews being under close supervision. The safety successful contractors interviewed by Sluss varied in their supervisory manner, with some having close supervision, others allowing crew to work and watch out for each other. As the literature in other studies reports the variety of leadership qualities that can be successful, it is not surprising that the level of supervision varies.

Two thirds of the group had a formal training programme, with a contracted (non-crew) trainer being the most common source of training.

Other reported training sources included the contractor themselves, crew members or in-house trainer and foreman, with only 3 citing a polytechnic trainer. All contractors reported that following training, they "always" or "frequently" followed up on new methods and 80% praised employees if they saw them using the right methods.

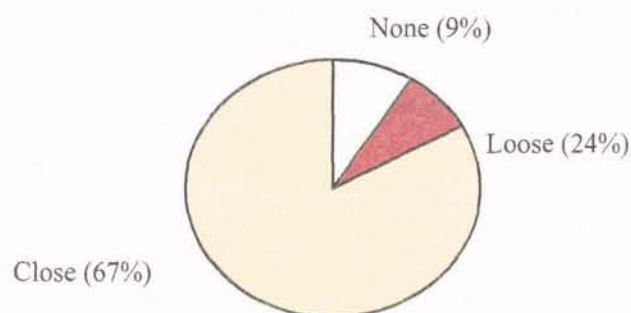


Figure 1: Level of supervision of "safety successful" crews

Turnover

Between zero and five crew members had left the crew within the three months prior to the survey. Reasons for turnover included dismissal (for safety breaches and drug use, or not turning up for work), to personal issues including changes in career, overseas travel and wanting to be closer to family members. All reported that at least 95% of the crew report to work daily.

Safety Management

Contractors were asked in an open question to describe what they thought the factors were that contributed to their safe operation. Responses are summarised below:

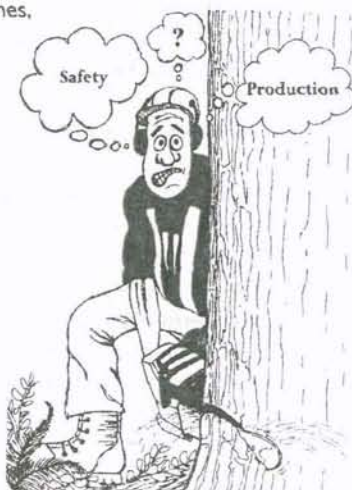
- Experience, training and skill of the contractor
- Commitment of the contractor to safety
- Experience and/or good training of crew members
- Selection of an enthusiastic and appropriate crew
- Setting a good example as a contractor and creating responsibility for actions
- Acting quickly and positively (non critical) on safety issues and giving feedback
- Having appropriate safety guidelines, audits and systems in place
- Not pushing people too hard (no excessive pressure or long hours, safety taking priority over production)
- Communication, safety discussions, crew rapport
- Provision of good gear, machinery and safety equipment
- Threats and punishment for unsafe acts

All but three contractors described measures they had taken to reduce injury rates, despite reporting no LTI for the last year.

These related to:

- People skills and management (communication, training, selection, skills, support of inexperienced members, penalties for poor practice)
- Organisational (safety systems, audits, hazard identification, reports of near misses and incidents, meetings, prioritisation of safety, sufficient staffing)
- Mechanical (maintenance, mechanisation, separation of people and machines, supply of good safety gear).

Of the "safety successful" contractors, 91% thought that improved safety resulted in increased production - only 9% said it either reduced or had no effect on production. In contrast, 40% of contractors who did report LTIs (n=15) thought that improving safety either reduced or had no effect on production.



Interview Results

Six follow-up semi-structured interviews were carried out. Contractors suggested that shorter hours, and/or reduced production pressure would help improve safety. A desire for more mechanisation was expressed, to reduce manual work and limit the current mix of men working around machines. Improved communication with the forest companies was also suggested. All the contractors stated they would not compromise safety to continue working if conditions were unsafe, such as in high wind, and/or wet weather although stating a reluctance to reduce productivity.

All the contractors described ongoing communication as being an effective way of getting safety messages across. All had monthly safety meetings, and described additional communication between these meetings to discuss other issues arising. They encouraged feedback and flow of information between contractor and crew members, with particular reference to "on the spot" comment. This ongoing discussion was also a finding of Sluss, who found that regular scheduled meetings tended to take place more often with larger crews, and contractors described discussing issues as they arose. The interviewed contractors also saw safety leaflets that are distributed to crews, such as Liro fliers and company newsletters, as important means of delivering safety information. Most of the interviewed contractors did not specifically reward safety, saying they believed the worker should assume safety as being part of their job. Two did describe either praising safe behaviour or rewarding safe work with high visibility ("hi-viz") t-shirts. Three had dismissed crew members for safety breaches and two also described a preference to discuss and give feedback to the worker concerned, with the aim of improving the performance to higher standards, rather than dismissing them.

Contractors cited experience, skill and conscientiousness as being the characteristics that make them a successful contractor. This needed to be backed up with practical safety management such as use of safe systems (for example two skid site areas to keep machines and manual work separate) and increased mechanisation. One contractor described the importance of always being there to look out for things. Not putting too much pressure on the men, giving them regular breaks, and trying to stick to a five day week were also given as a means to safety and production success, with the comment "we're happier to have less pay for a more laid back approach".

Contractors described good communication, experience and hard work as contributing to their success.

Discussion

The forest industry is an example of an industry where the work environment is hazardous and changeable, and despite efforts to identify and reduce the risks, encouragement of safe worker behaviour is essential. A wide and complex variety of characteristics have been identified by Sluss (1992) and other research as being beneficial to running safe operations, which give an overall impression of good people management and communication, and an approach of high priority towards safety. This survey identified similar characteristics to those identified in the literature indicating that contractors are using at least some of the qualities said to be valuable for effective management. The contractors tended to come up with ideas in terms of communication and incentives, more than practical issues like systems and equipment, although this may reflect the style of the survey.

The issue of safety being integral to overall management of the operation seemed to be highlighted in this study by the perception of the effect on production of addressing safety with a large proportion of the group reporting LTI believing that addressing safety had no effect on or actually reduced production. It may be that examples of successful safety programmes in highly productive crews could be promoted as an educational tool, to emphasise the need not to choose between the two.

Safety does not have to be at the expense of productivity. The industry needs to continue to promote the integration of safety into day to day operations.

Not all the "safety successful" contractors volunteered ways in which they have improved safety, implying that having a low injury rate indicates they are doing enough. This maybe an area for further investigation to ensure contractors' perception of safety management is one of a changing and continually developing area.

Safety and health is an on-going and proactive process.

With increasing demands on the industry for a stable and growing workforce, pay is an important issue. Contractors valued fairness to their workers, using a consistent pay (such as an hourly rate) backed up with the potential for production bonuses, similar to the findings by Sluss (1992). A total production emphasis may have the danger of causing pressure and short-cuts in worker behaviour. The interviewed contractors largely suggested that they do not reward safety. It may be that promotion of alternative ways of rewarding employees is worth pursuing among New Zealand contractors, and even among the companies they contract to, who currently focus on accident reports rather than evidence of safe practice. There was an emphasis by the contractors on teamwork and communication. The style may vary between groups, according to contractor personalities, but the common theme is one of safety being of high in priority and an integral part of the operation, and that this should be reinforced regularly through actions, communication and feedback.

Rapport between crew members, skill levels and selection appeared important to these contractors. They were happy for a small level of turnover to ensure the right people for the job, and to inject fresh ideas and skill, but wanted to keep turnover at a low level to maintain standards. It is important that right kinds of conditions are offered to retain good crew members, to reduce their incentive to move on. (Cummins, 1998).

Encourage safe behaviour with positive feedback, incentives and rewards. Focus on good practice rather than on injuries.

Although provisional, the study does provide a baseline of knowledge about what this group of contractors believes is important for good safety performance, and it gives an idea of the characteristics of safe performers in New Zealand. Gathering more understanding on these characteristics is particularly pertinent as contractors are becoming more management orientated, with additional responsibilities to running day to day operations (e.g. key suppliers). This evolution (as opposed to a deliberate career change for example) means that contractors may not have the particular skills required, despite perhaps being excellent with a small or single crew. Man management and methods of communication become increasingly important as the size of the group being managed increases – it may then be more difficult to obtain some of the characteristics highlighted, like having the respect of and regular contact with workers, and leading by example. As the forest industry increasingly relies on larger operations, in the form of key suppliers, it is important to address these issues.

Effective communication is a key component of good safety management.

The study had a number of limitations, including getting contact details of a cross section of representative contractors. There was a relatively low response rate and it may be that those with good safety practice or an interest in the topic responded more readily. There was a reliance on subjective reporting of accident and injury figures. For future progression of similar work it would be valuable to obtain objective information of contractor safety and performance, and check reliability by comparison with contractor reports. However this raises compliance and ethical issues and it would be essential to determine a method of obtaining data that had approval and backing of the participating contractors.

There were a number of telephone discussions with contractors who declined to participate in the survey having received the questionnaire. These contractors gave opinions similar to those interviewed in the follow-up telephone calls, with a concern about increasing pressure to put production above safety in priority. Those declining the survey saw themselves as safety successful contractors, who despite their good record in terms of accidents and production felt this had little to do with current ability to succeed.

They also described an emphasis on reducing reports of injuries, rather than on actually *how* the operation is run. Although these comments are from a small selection of contractors, they may reflect that the boundaries between

contractor and company responsibilities still need some adjustment or at least that communication is improved. Indeed, Jayne (1997) describes a contractor's view early in this process of change, identifying the same concerns as some of those described by the participants in this survey.

Further research is needed to investigate the extent of the identified characteristics throughout the New Zealand forest industry. This would allow more effective education and information to be targeted to both forest companies and contractors. Targeting specific requirements to these different management levels would help develop safe and successful practice within the industry as a whole.

Continue to explore and promote means of effective safety management within the New Zealand forest industry.



