

## CONSTRAINTS AND HAZARDS ON STEEP COUNTRY ( A SUPERVISORS PERSPECTIVE )

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### INTRODUCTION

There are graphic differences between almost every phase of Logging Operations on flat areas compared with logging on steeper slopes insofar as every constraint impacts more heavily on operational hazards.

The objectives of this paper are to:

1. Highlight some of these constraints which compound directly on the Operation and how it is carried out, and others more directly involving the human reaction to constraints.
2. To provoke a little more compromise from those making some of the more far-reaching decisions that directly affect the people trying hard to "make a go of it" in steep country.

I have chosen Tairua Forest as an example to highlight some of the physical constraints as I am sure the resulting hazards are relatively typical to all steep country operations.

### PHYSICAL CHARACTERISTICS OF TAIRUA FOREST

#### 1. TOPOGRAPHY

Tairua has rolling to steep terrain of volcanic origin which has been subjected to severe natural erosion causing a tortured and castellated terrain which is bisected by many streams and deep gullies. The forested hill country gives way to fertile alluvial flats and shallow estuaries along the coast.

#### 2. SOILS

Have generally originated from Whangamata or Tairua/Waihi ash showers.

On very steep slopes much of the ash is absent leaving only broken rock mixed with clay. There are also occasional pockets of "rotten pumice", swamp, rock, outcrops and razor back ridges.

#### 3. CLIMATE

The climate of the area is characterized by frequent high intensity localised rain storms typical of tropical origin.

By the mere definition of topography, soil and climate we can see the constraints and potential for hazards emerging.

### WHAT DOES THE RESEARCH INDICATE?

An analysis of 245 lost time hauler accidents reported to the Logging Industry Accident Reporting Scheme between 1985 - 1991 showed breaking out to be the most dangerous part of the operation closely followed by skid work and felling.

Table 1 - Lost time hauler accidents by type of operation (%)

Breaking Out	31%
Skid Work	29%
Felling	22%
Trimming	8%
Rigging	3%
Other	7%

**Table 2 - Breaking out injuries by injury agent (number)**

Hit by Drag	17
Slip Over	17
Hit by Rope	10
Hit by Strops	7
Cut by Sprags	5
Hit by Thrown Debris	4

**Table 3 - Skid work injuries by injury agent (number)**

Cut by chainsaw	16
Hit by Loader or its Load	14
Slip on Logs	11
Unhooking Drag	9
Hit by Incoming Drag	5
Hit by Rope	4

I am not about to re-analyse these statistics, however, the **occurrence** of accidents and **where** they occur indicate the hazardous areas, to this extent I will refer to these statistics where applicable.

### WHERE AND WHY DO WE HAVE PHYSICAL CONSTRAINTS AND HAZARDS

Although the following constraints and hazards interact very closely with each other the "phases" can be looked at separately.

### LANDINGS

As forest harvesting increases in steeper areas such as Tairua, economic and environmental constraints associated with landing construction will also increase.

Given that planning indicates the landing has to be situated in a certain position to allow for adequate deflection, in many areas of Tairua it is not possible either economically or by having regard to Catchment Authority Constraints, to physically "move enough earth" to gain any size.

Sharp ridge systems, proximity to watercourses and adverse spur road grades often complicate this problem and options are generally few.

Some of the options that are available include:

- \* Split level landings (Allows the hauler to be distanced from the processing and logging phase).

- \* Two staging often works well but often more expensive, due to the extra machine required.
- \* Logyards on a small scale can be costly, they do however remove raw stockpiles allowing more usable area.

Okay, so we have small landings 40m x 40m maximum.

We put a Madill 171, a 30 Tonne Excavator Loader (or worse still a RTFL) a Bell Ultra, a Logging truck and 3 skid workers and up to 10 different log stacks on the landing and you can not help but have an interference problem.

From my perspective, injury results on landings as indicated are not altogether suprising.

29% of Lost Time Hauler Accidents are on landings. Significantly if the workable area is further limited, men and machines will be placed under further pressure to process the daily production.

Remember the Breaker Out can still "hook up" (in most instances) at the same speed even if something has gone wrong on the landing (i.e. the logs still keep coming in).

It is therefore very important that Breaking Out, Processing and Loading Out on restricted landings is in "phase".

### TRANSPORT & MARKETS

The next logical link in the chain of constraints given that loading out must be in phase to reduce pressure through small landings is to discuss briefly the transport system and markets as concerns Tairua within its cutting circle.

The majority of "on landing" constraints are caused by our inability to be able to "hot deck" logs. As there is no storage potential once you fall behind with uplift, even for a day, it is very difficult to "catch up". This can and usually is compounded by:

1. Too many different specifications/cuts.
2. Production of too much pulp (particularly in Southern Pine Export orders) as a result of the specs not relating to the bush or 2/3 of the original spec being removed part way through the order. Occasionally the operation must be stopped for safety

reasons to allow the processing and/or transport to catch up.

## FELLING

\* The positioning and size of the landings directly impacts on the falling phase. The faller must consider many more options in order to present the wood for it to "flow" to the landing.

\* In some instances because landings have had to be positioned in a particular place the faller is unable to fall with the predominant lean, if he is to present the tree for butt pulling.

Immediately this constraint presents potential hazards. How long and hard will even a competent faller fight his bush without taking shortcuts?

\* Pre-emptive cutting is the current "in vogue" option designed to reduce congestion problems associated with tree length processing on the landings. It is however slower requiring a greater "lead in" time to get the wood on the ground before the hauler. This not only causes frustration but can cause problems in the summer with sapstain.

Pre-emptive cutting may be an ideal option where the terrain is either flatter or the piece size is large. However it requires a very high rate of work from the faller (as indicated by Mr Parkers Study), particularly if the piece size is small (i.e. more stems must be limbed and cut for the same volume).

**When humans get tired they are prone to make mistakes.**

Felling has been recorded at 22% for Lost Time Accidents in Hauler Operations. Generally falling accidents are serious: at best they are only Lost Time Accidents.

I do however feel that with constant effort on the Training and Safety front this statistic can be brought down: as attitudes in our area at least on the falling front are changing very much for the better.

## TRIMMING

Is a very underated hazard in steep country logging.

Despite training suggestions of walking beside the tree (fine for flat clean areas) fallers will continue to walk along the log (bent over like staples) for the obvious practical reason of unhindered progress.

This body position is further exaggerated when the trees must be felled more in the downhill direction (for optimal extraction).

Consequently I would suggest that of the 8% Lost Time Accidents for Trimming on steep terrain a similar severity in lost time could be related to back problems brought about by prolonged trimming in the "staple" position.

There are far too many young faller/trimmers (<30 years) who already suffer from lower back problems.

Fallers working in Hauler Operations at Tairua must trim in the bush. Almost all exhibit the above-mentioned problems

Fallers at Maramarua must not trim - they do not have the same problem.

It is almost that graphic.

Although modern chainsaws are markedly lighter in weight and smaller saws are encouraged, smaller saws generally must run shorter cutting units which require the operator to bend further to limb. (Catch 22 situation).

Training is producing much better body position and posture from fallers in the falling phase, but I would like to see more research done in the area of steep country, practical limbing techniques/options and or any possible ergonomic improvements.

Perhaps the human cost to back problems is too high:

\* Does all trimming need to be done on landings where the body can remain upright?

\* Are delimiters the answer?

## BREAK OUT

The Breaking Out phase has long been "touted" as **the** key position in hauler operation. I agree - not only are there real hazards to the Breaker Out himself, but the

consequences of his actions could be catastrophic to everyone on the landing as well, without the added constraints of unforgiving topography soil and weather

Tairua has been a Breaker Outs nightmare for the past 6 months due to:

- \* Poor deflection resulting in much bridling.
- \* Ridge systems that require skyline extensions to complete spans.
- \* Dutchmen as options to unacceptable bridling limits,
- \* Constant wind from the wrong quarter forcing fallers to change direction complicating extraction in relation to landing positions.

Historically Breaker Outs have learned through experience and instinct the play-off between rope length, (and consequently weight) tension and how much payload can be safely supported.

He must be highly motivated to keep on top of hazardous situations even though often, he is the meat in the production sandwich.

Perhaps I can explain:

In difficult situations such as bridling a long way out with a major watercourse to suspend over, payloads must be kept to perhaps two logs at a time, any more and things "start to happen".

However the boss is screaming for production, the fallers have already had their input by not being able to fell the trees in the optimal direction. Once again the avenue for shortcuts is wide open.

Training and research for Hauler Breaker Outs justifies much more work.

A greater understanding by Breaker Outs will be required as environmental constraints/extraction machines/carriages/even ropes become more complex and as the pressures for production from smaller piece size in steep country manifests itself.

### OPERATIONAL CONSTRAINTS CAUSED BY PLANNING

The modern planner has many sophisticated tools (PLANZ) to aid him in arriving at a successful solution for harvesting difficult areas.

One of the problems in the past has been that a lot of the base data has been inaccurate or incomplete producing poor results. Base data appears to be getting better and coupled with much more "on the ground" familiarisation is producing better theoretical results.

I say theoretical because there are many little operational problems to be dealt with also.

To this end it is imperative that plans are discussed and compromises made with the following:

1. Operational people
2. The contractor to be involved and
3. Rooding people

Each have their own story to tell (real or imagined) and in many cases suggestion followed through by the planner can result in a "real effort" being made of awkward situations purely because of involvement and the "that's my idea so I am going to make it work" attitude.

NB: Without involvement this attitude can work even more effectively in reverse. i.e. it is much easier to be negative than positive.

Poor planning can result in incredible frustration and in many instances the constraints caused by bad planning or its aftermath may have to be lived with for subsequent rotations.

Don't belittle "those doing the graft" - they ask all the right questions and it is usually very obvious what **should** have happened once the trees are removed.

### A FUTURE HAZARD?

An unusual but definite constraint on production and in particular the well being of fallers and those breaking out has emerged very strongly this year as something not to be trifled with.

Vespula germanica and Vespula vulgaris. Yes WASPS. The common yellow and black German social wasp.

Not so social it seems, many a faller has been chased off his saw with a tree cut up or a breaker-out observed doing Carl Lewis imitations across the cutover.

Unfortunately that is about as far as the humour goes with these hot little chaps.

During the period of March, April 1992 over 200 nests were destroyed ranging in size from

that of a football to nests 2m x 2m x 1.5m deep. They appear to prefer steep sunny aspects close to water and are prepared to nest in trees once the ground pressure for nesting becomes too high. There has been a (documented) massive population increase on the Coromandel Peninsula since 1987 particularly with the vulgaris species.

A DSIR Zoology report "*Special Issue on Wasp Research*" makes for very sobering reading. Expect to have to address this problem in the future in many areas.

### ATTITUDINAL CONSTRAINTS

Attitude affects everything we do, no more so than at work.

How often have we heard phrases such as:

- "It's just a job"
- "I'm not paid enough to think"
- "What do I get out of it" (training issues) or
- "I've done it like this for years I'm not changing now" (Usually from the 300 year old loggers).

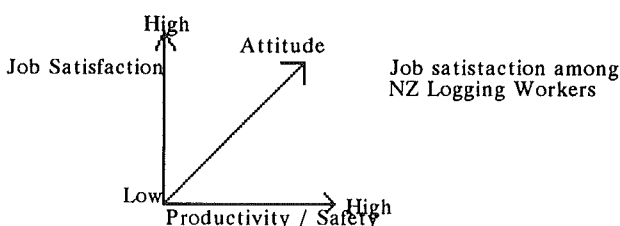
Characteristics of attitude are no doubt common to all Logging Operations however I believe attitudinal constraints are exasperated in steep difficult country.

With the wrong attitude we can be potentially **more** hazardous to ourselves and others than can any of the previous physical constraints.

There have been all manner of studies and papers done on worker attitude/image/job satisfaction. I am sure they are correct as they all draw parallels with the importance of attitude on productivity and safety.

If motivation and attitude towards the job are correct so too must job satisfaction.

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No matter how sophisticated or up to date the "IRON" is, an operations productivity will only be "ho hum" or "just average" unless there is committment and motivation from

the employees and employer to the job and to each other.

Bryce Heard in his key note address 1990 seminar made the statement "*Goals of the employer must align with those of the employee*"

I would suggest that this probably holds true for attitude in general also.

Unfortunately as the major forest owners move away from the "Mother Hen" approach towards contracts and contractors, attitudes such as motivation and committment and its subsequent management is falling squarely on the Prime Contractors shoulders. Maybe this is where it should be, but the major companies if not for the contractors but for the enhancement of "Image" in New Zealand's Logging Industry, need to assist more in the avenues that are open to them. After all, they stand to gain just as much from Image enhancement as anyone.

### TRAINING

One of these areas is obviously training. There will always be a need for increased skill levels both operationally and through improved communication.

Now that we have a National Structure in place recognised as a National Certificate by the NZQA we should actively support it.

### INCENTIVES

Money is purported to be only a short term motivator (it works for me) but in many instances I am sure it would jump start trainings image.

Most apprenticeships have at the "end of the day" potential to create a job with better wages, salary and or higher status within the chosen industry.

At present if a NZ Certificate in Forest Harvesting is attained there is nothing gained other than self-satisfaction. (Unless the boss comes through).

Perhaps an extra \$2.50/hour to the holder built through the Prime Contractors m3 rate would create outside interest.

Whatever the incentive, management has a role to play in providing the goals; after all it's too easy at the moment to retain labour,

what happens when (or if) the employment situation frees up. How will we attract people (let alone skilled people) into our far from glamorous industry?

## CONCLUSION

To conclude, I would like to say that although I have jumped over a number of topics, there are three main areas that from my perspective **must be addressed** to enable us to deal more effectively with the myriad of constraints and hazards within the NZ Logging Industry and in particular the steeper more difficult areas.

1. Everyone, from upper management to employees in logging crews need to listen to each other more. There is an old saying "we have two ears and one mouth, we should therefore do twice as much listening as talking".
2. Don't let problems fester - "problems are relative" but do not think that because I'm the boss my problems are bigger. It's a state of mind, his problems to him are just as big and if left unanswered have the potential to become your problem anyway.
3. **Everyone** needs to compromise more as this can go a long way to narrowing the age old ever present "Them vs Us problem". After all, to a larger or smaller extent, life is one big compromise anyway.