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NEW ZEALAND

TEN YEARS OF MECHANISED LOGGING

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INTRODUCTION



Figure 1 - One of the original Kockums 880 Feller-Bunchers introduced by Australian Newsprint Mills Limited in 1981

This Technical Release describes how one Australian company has approached the problem of organising the procurement of logs that the industry in New South Wales uses, and emphasises the training aspects that were employed.

It will give a brief insight into why and how particular logging systems were chosen, and what steps were taken to ensure that a viable operation was established.

BACKGROUND

Australian Newsprint Mills Limited (ANM) has two paper mills, one at Boyer in Tasmania and the other in Albury. I will confine my comments to the Albury Mill even though we have followed basically the same path in the establishment of a large pine harvesting operation in Tasmania since the Albury start-up.

The Albury Mill produces newsprint for the Australian market at the rate of about 200,000 tonnes per year. This equates to about 30% of the Australian market. The mill employs 380 people on-site, but indirectly employs many more than that as the Company has a policy of contracting out as many of its activities as possible. For example, there are about 70 people contracted in harvesting and a further 60 involved in log cartage.

At this stage the Albury Mill only uses radiata pine wood as its raw material, and currently we are using about 490,000 tonnes of pulp logs each year.

Harvesting is carried out by eight harvesting contractors who currently have four year contracts to supply pulp logs. The logs are loaded and carted to the mill by one contractor, Finemores Limited, who have a six year contract for this work.

DEVELOPMENT OF THE HARVESTING SYSTEM

In the late 1970s the large areas of pine plantations in the Tumut/Tumbarumba region in New South Wales and the Shelley, Beechworth and Myrtleford regions of Victoria were starting to mature to the extent that large quantities of pulplog were being produced.

ANM Limited was successful in agreeing with both State Governments to purchase wood resources from these forests. Thirty year agreements were entered into with both New South Wales and Victoria. The New South Wales agreement is for 323,000 tonnes per year minimum, and the Victorian agreement is for 120,000 tonnes per year.

Having made agreements the problem was then how to harvest the wood, as the operation was planned to be basically one of thinning the plantations.

It was planned to be the biggest thinning operation in the world, and there was no established technology available to do the work other than the motor-manual (chainsaw) based systems.

An exhaustive study was undertaken during 1979 and early 1980 to plan the harvesting.

This study identified three potential systems:

1. Motor-manual tree falling with forwarding.
2. John Deere 743 Harvester, manual cut to length and forwarder.
3. Kockums System consisting of 880 Feller buncher, 85-41 Logma processor and 85-33 Forwarder.

The selection of an appropriate system therefore came down to which of the three options best satisfied the following requirements:

1. To be cost effective over time.
2. To supply the mill's requirements on a regular basis.
3. To allow machine access through the heavy hardwood debris that was on much of the forest floor.
4. To be capable of producing and sorting sawlogs and other products that would need to cut along with the pulplogs.
5. To provide a work environment consistent with ANM's philosophy of achieving a high safety performance and an amenable working environment that would attract and keep good people.

The motor manual system was ruled out on several grounds. At the time Workers Compensation premiums were between 20 and 60 percent of gross wages, reflecting a very high accident rate.

In addition, this system would have required the attraction, training and retention of about 260 cutters. This would have been very difficult to achieve. Even with good training, accidents were still prevalent. The work is also very hard physically and climatic conditions vary from very hot to cold making it difficult to keep other than the most highly motivated men.

From what had been seen and learned about mechanised options, it was decided that mechanisation was the way of the future. The choice of systems boiled down to one of either the North American or the Scandinavian philosophy and technology.

Here a very interesting cultural difference was evident and it was this that finally decided the issue.

In North America and Scandinavia, two entirely different philosophies existed regarding the training of machine operators. These differences dramatically impacted on the type of machine designed and used in the respective countries.

In the United States, at that time, and particularly in the Southern States, there existed a philosophy probably best summarised by the commonly used term of "idiot-proofing". This meant making rugged and simple machines that an unskilled and supposedly unintelligent workforce could operate with the minimum of downtime and maximum physical productivity. Ergonomic considerations were virtually unheard of.

Little corporate loyalty was expected or given by management to the forest employee and vice versa. "Hire and fire" at short notice was accepted - indeed it was believed to make the forest industries much more competitive and profitable.

Forest workers had a wide range of employment opportunities, and these circumstances tended to produce an itinerant worker living in mobile homes.

Admittedly the United States of America is a large country and there are many exceptions to this generality. Since those days the Scandinavians have made moves into the market there and some changes are now evident.

As a contrast, in Scandinavia a number of factors was evident:

1. The employer had responsibilities to the employee who was expected to return this loyalty to the firm.
2. Industry was decentralised and workers did not change jobs frequently, as this would require moving family and home. Often families had lived on their land for generations and had a strong attachment to it.
3. They believed that the majority of their workers were capable of skilled employment.
4. It was believed that workers competent in their craft are under less stress and consequently more content in their work.

5. Increased productivity results from training, so that training is a highly profitable activity.
6. Machine availability and utilisation is considerably increased by expanding the operators skills beyond that of merely operating the machine, into fault diagnosis and into undertaking a considerable degree of repairs.

Thus, an employer who invests heavily into training forest workers is unlikely to lose them to competitors. Training was seen as correct for social reasons but primarily as a good economic investment.

Scandinavian forest equipment therefore tended to be sophisticated, with specialised machines fitted into harvesting systems to suit the forest they worked. The equipment was ergonomically well designed, with a lot of thought going into the operators physical and working environment.

It was recognised that the success of this type of equipment is dependent on the availability of a stable, well trained and highly motivated team of operators and back-up service men.

MACHINE OPERATOR TRAINING

Both Sweden and Finland have excellent forestry worker training schools which are either attached to the secondary or post-secondary schools.

A typical school is one at Jamsa in Finland.

After High School, students come for one year to study what they term "forest economy". After this year they can then split into one of three streams:

- * Chainsaw operation
- * Machine operator then Forest technician (in three years they can become mechanics)

- * Forest engineering (five years of study)

This school has 230 students and 70 staff, which includes chainsaw and machine operators, mechanics and technical instructors.

They also run adult education courses of one week's duration.

Food, lodging and training are free, and students get a scholarship payment.

The school has 1000 ha of its own forest.

In Sweden, the Forestry Act sets out support for training and research, and two years of forestry schooling can be done as part of the State Education system. Perhaps this is why the population has a better appreciation of forestry and the environment and are less susceptible to the green movement than we in Australia!

An example of what the machine manufacturers do in this field is that of Valmet.

Valmet now has a very impressive facility in Umea, Sweden. They will not sell a machine in Scandinavia without providing training as part of the sale. If the buyer does not front for the training they won't deliver the machine!

Valmet train 1200 people per year at their Umea school, trainees being Operators, Mechanics and Foresters. They usually train in groups of eight to ten, and they employ ten teachers plus another four instructors who spend time in the forest with the new owners after machines are delivered.

The price of training is included in the cost of the machine.

Valmet emphasises the importance of training operators to diagnose machine faults so that there is minimal downtime when faults occur.

ANM Limited were very impressed with this and decided to choose the Scandinavian equipment as it was thought the

commitment to the people involved was likely to succeed in the Australian context. Obviously the way the training was to be carried out had to be modified to fit the Australian circumstances.

INTRODUCTION OF THE MACHINERY

The Kockums equipment was ordered for delivery in December, 1980. That is, ten individual systems consisting of: a Feller-Buncher which sheared the trees off and stacked them in a neat bunch; a Logma Processor which removed the branches and then cut the logs into the desired lengths; and a Forwarder which picked the logs up and transported them to roadside where they were either stacked or loaded on to trucks.



Figure 2 - New Kockums machines ready at the Training School in Green Hills Forest - March, 1981

That was an order of thirty machines. A large order such as this enabled the manufacturer to provide an effective training package, and also to be able to provide adequate technical and spare parts backup in Australia. This concentration on one brand, with a high percentage of spare part commonality, was designed to ensure the best chance of success of the equipment in the Australian logging environment.

It is hard to realise now but in 1981 virtually none of the operators had even seen their future machines. When many of them turned up for their training courses they

were taken out to the yard and shown these beautiful new red machines that were soon to become part of their lives.

As Albury was a new paper mill we were able to schedule training in a phased way prior to the start of paper production.

Operator training was a joint venture between the College of Technical and Further Education (TAFE), the machine supplier (Kockums) and the company (ANM Limited).

Three courses of four weeks duration each were held.

To ensure maximum effectiveness an Australian flavour was injected to the training. ANM sent a TAFE teacher and an expert machine operator to Sweden for three months to get a thorough background in the equipment and the training techniques to be used by the Swedes.

Kockums had also sent a Forest Engineer to Australia to lay the ground work for the training and he was here for over twelve months.

A team of Kockums experts were brought to Australia to help with the courses which were, incidentally, the first to be run outside Sweden for operators of this sort of mechanical equipment.

The object of the courses was to cover every aspect of the harvesting operation from first principles, and to ensure that operators were given every chance of success.

The courses were programmed so that the first week was held at the TAFE facilities at Tumut, N.S.W. and the final three weeks were spent at a forest school which had been set up in Green Hills Forest, N.S.W. This facility had classrooms, a workshop and an area of forest for harvesting training to be undertaken.

As each new Contractor came to the school his new equipment was delivered there for his people to train on and prepare the machines - an ideal situation.

Subjects included in the courses were the following:

- * Background on ANM Limited
- * The newsprint manufacturing process
- * Quality requirements for pulp and sawlogs
- * How the machines were selected
- * Safety aspects of operating mechanised logging systems
- * Safe working practices in the forest
- * Forestry practices and operation types
- * Introduction to each machine type and its functions
- * Environmental considerations for forest work
- * Team building
- * Basic hydraulics
- * Basic electronics
- * The electric and fire systems in the machines
- * Transmissions
- * Engine characteristics
- * Daily maintenance schedules
- * Scheduled maintenance
- * Trouble shooting in electrics and hydraulics
- * Development of a machine daily operating record system and contractor's management system
- * Harvesting plans and Code of Logging Practice
- * Production specifications
- * Operational planning
- * First Aid

Many hours were put in on the actual machines as it was realised that a lot of the trainees would have found the class room a bit daunting. The Swedish experts were well versed in how best to operate the machines so that productivity increases came easily with time. They also gave a lot of guidance in all-terrain operation of large equipment.

The Kockums experts in charge of training were impressed with the performance of the operators and compared them more than favourably with Scandinavian forest workers, who often served a five year apprenticeship-type training.

Obviously the employers, i.e. the harvesting contractors, had done a very good job in employee selection, and this was a large reason for the success of the introduction of the mechanised equipment.

Before returning to Sweden, the Kockums people also ran a two week course for mechanics at the TAFE.

About six years after the courses had been run, ANM did a census of the people we had trained. Of the 71 trained in various courses only six were no longer in the industry, i.e. the attrition rate was less than 10% in six years. This was an excellent result compared to many other industries.

CURRENT SITUATION

The introduction of new starters to mechanised logging is now a much more simple process due to the large pool of trained people, the backup provided by the Scandinavian manufacturers and the number of machines available.

Currently training is much less formal than in those early days.

The usual process is that a Contractor employs a new starter in his crew, and lets him operate the machine under supervision during meal breaks.

If the new starter shows some aptitude, more formal training can be organised through the facilities built up by industry

under the Eastern Riverina Forest Industry Council's safety and training scheme. A range of courses have been developed by ERFIC and also Tumut TAFE which can provide an excellent basis for people starting in the industry.

ERFIC owns a forwarder which is used as a training machine for new starters so that their activities do not slow down the normal production of the crew.



Figure 3 - Kockums 85-33 Forwarder now used as a training machine by ERFIC in Tumut, New South Wales

In conclusion, ten years after the first introduction of mechanised logging equipment, we have excellent operators and facilities for training that fit our needs.

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