LOGGING INDUSTRY RESEARCH ASSOCIATION
NEW ZEALAND

ISSN 0111-4743
TECHNICAL RELEASE
VOL. 5 No. 4 1983

OREGON STATE UNIVERSITY FOREST ENGINEERING "SHORT COURSE"

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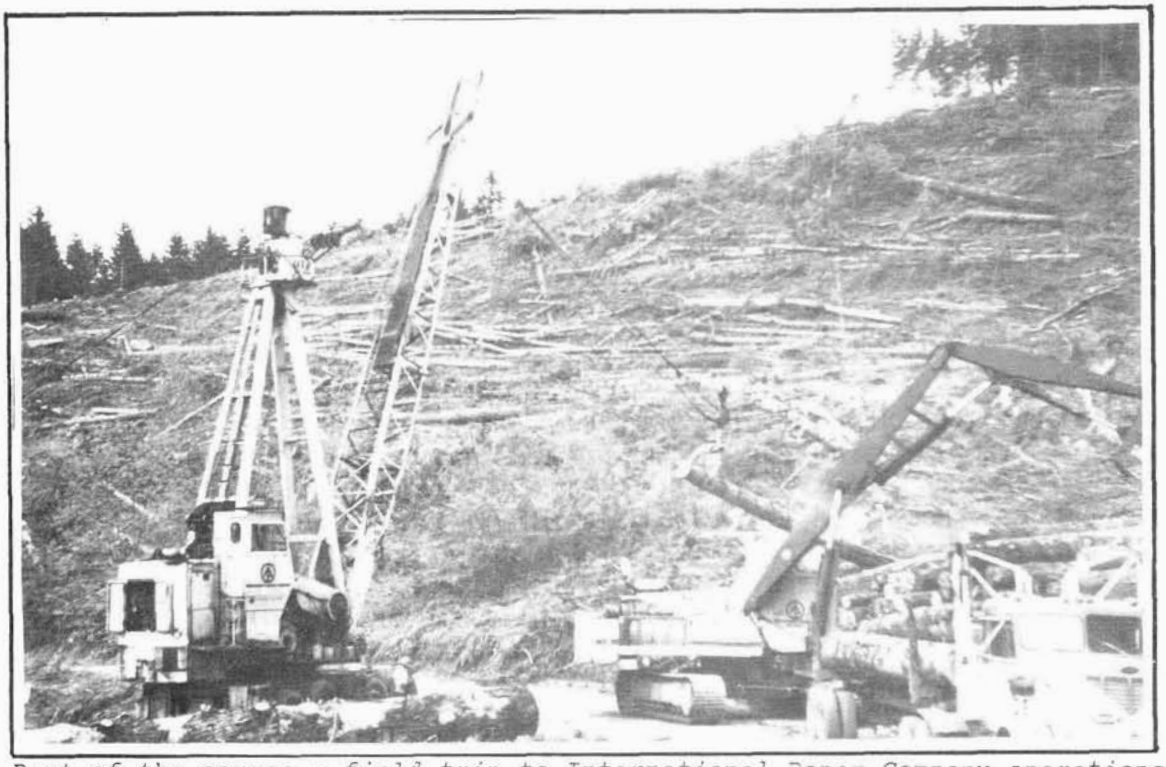

Part of the course - field trip to International Paper Company operations in Vaughan, Oregon -Washington 118 swing hauler.

INTRODUCTION

In 1978 the U. S. Forest Service decided that if economically, operationally and environmentally sound logging plans were to be prepared, appropriate training for logging planners would have to be made available. Accordingly, a specialised ten week logging planning course was introduced at Oregon State University.

THE COURSE AND PARTICIPANTS

The Oregon State University runs two ten week courses each year - January to March and March to May. It must be stressed thatthis course does not produce forest engineers. Instead, it produces specialist logging planners.

The course consists of classroom and field work complemented by homework and projects. There are four main topics - logging systems, engineering, engineering economics and watershed management. Tutors are drawn from Forest Service staff, university staff, post graduates studying for a Masters in Forest Engineering and guest lecturers from industry. Course participation is open to all sectors of the forest industry.

COURSE OUTLINE

Logging Systems

A study of logging systems occupies 60% of the course. Ground-based, cable and aerial systems are all covered in depth. Once the characteristics of each system are understood, the use of analytical techniques to test their operational efficiency is examined. The use of such techniques in cable logging is given particular attention.

In any cable logging operation, the effects of topography and hauler location must be understood. There are several methods of analysing the effects of different hauler locations on payload capacity. The simplest of these is graphical analysis of forces in the lines which, although a slow, time consuming procedure, nevertheless teaches the student the mechanics of the system. A simple, yet useful progression from this is the chain and board technique which requires only basic equipment and yet gives an easily understood visual presentation. Programmes for hand-held calculators or desk top computers are the most convenient option and considerable progress has been made in their development in recent years.

The study of the cable systems is not restricted to calculating the forces involved in the working lines. Once it has been determined which hauler placement will give the best payloads, an analysis of guylines and anchors is carried out. Once again, graphical and computer-based systems are available.

The emphasis on cable logging does not mean other logging systems are ignored. Techniques for analysing the effect of topography on ground-based systems are introduced. The course teaches the importance of designing landings to suit the system, ensuring that sufficient landing space is available and that excessive formation costs are avoided.

Engineering

This covers the engineering requirements of road and landing design. Costs can be kept to a minimum if over-designing can be avoided.

Surveying and road alignment topics are covered along with an introduction to the uses of aerial photography. This is a useful planning tool, especially where topographic maps are inaccurate or unavailable. Although aerial photographs are used to a limited extent by New Zealand planners, the full potential of these aids is not normally recognised. Planners can check road grades from photographs by the use of parallax bars. Stocking and tree weight can also be assessed. High altitude photography can be used to pinpoint environmentally sensitive areas. The number of possible measurements that can actually be taken from an aerial photograph appears to be known to New Zealand draughtsmen but not to logging planners.

Engineering Economics

The logging plan must represent the most cost efficient way of logging possible, given the options available and the constraints of the site. The calculation of Net Present Values and preparation of Discounted Cash Flows enables alternatives to be prepared over the long term. Formulas based on cartage, skidding, landing and roading costs are used to determine optimum landing and road spacing, and thereby determine the overall cost of the system.

The course also provides an introduction to simulation techniques, Critical Path Analysis and Linear Programming.

Watershed Management

In this part of the course, the planner is taught how to determine the effects of his plan on both the logging area and its surroundings. It is important, for instance, to identify potential as well as existing erosion-prone areas when planning roads. The effect of ground-based systems in compacting soils is given particular attention in the United States, and schemes which avoid compaction and save on expensive site preparation are being studied.

The scouring of roads can be overcome by calculating correct culvert placement and grade, and the course explains the procedure. Similarly, buffer strips help to avoid stream damage. However, the effectivness of the buffer must be analysed to ensure that it is designed properly and does not cause more problems than it cures.

RELEVANCE OF COURSE CONTENT TO NEW ZEALAND

Although the course is based on the timber sale planning procedures used by the U.S. Forest Service in the Pacific Northwest, much of the content is applicable to New Zealand logging planning - in particular, the analysis of cable systems. Methods such as the chain and board technique of determining skyline tension and deflection can be carried out anywhere without the need of specialist equipment. Hand-held programmable calculators have been available in New Zealand for some time but the software that enables profiles to be analysed in the field has only recently been introduced.

The analysis of anchors, guylines and other components of cable logging will become more critical with logging the smaller piece size of the future crop, as higher production demands are made. This smaller piece size will also require a greater appreciation of the economics of individual logging systems. Planning will need to be site specific and consideration given to each operating area and system option separately.

A SIMILAR COURSE IN NEW ZEALAND?

With some alteration to suit the New Zealand situation, this course could be transferred to a teaching establishment here. The location of the course would have to be decided by the availability of resources, teaching staff and field work opportunities.

The expertise is available within New Zealand to run such a course. What would be required is a Course Director to oversee the administration and organisation and tailor the course content to suit New Zealand requirements.

SUMMARY

The use of specialist logging planning techniques can only improve the operation and economics of New Zealand logging. The smaller piece size of the future crop and the high cost of machinery make it imperative that logging operations are efficient and well planned. This can only be achieved by planners considering every aspect of the operation. Planners need the type of training that is offered in the Oregon State University "short course".

The New Zealand logging industry is in a unique situation. There is a period of dormancy before the boom of the 1990's. This period must be used to assess the needs of the industry and to train the staff that will be required. Nobody else has been afforded this opportunity. It must not be wasted.

The course fee is NZ$1,800 which covers tuition, field trips, books and other course material. Accommodation is in the halls of residence at the University at a cost of NZ$750. Further information and application forms may be obtained from :-

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