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Evaluation of Cable Logging Systems in Interior B.C. and Alberta

In Canada, cable logging systems have gained general acceptance only in the large-timber stands of the Pacific coastal forest. However, cable logging is being considered in other areas to meet two problems: the inaccessibility of significant quantities of merchantable timber to ground skidding or mechanical harvesting methods; and, the need to reduce soil disturbance on steep or otherwise sensitive sites. Several logging companies in the southern interior of British Columbia and northern Alberta have recently been conducting operational trials of cable systems, to adapt machines and methods to their conditions.

FERIC studied eight of these operations over the period June 1974 to March 1976. The objectives were: (1) to develop study methods suitable for evaluating cable systems; and (2), to obtain information on machine characteristics and limitations, crew requirements, operational methods, productive and delay times, and output performance. The following machines were examined: Rosedale Ecologger; Madill 071 Skidder Tower (two cases); Koehring Bantam (loader converted for yarding); older model 70-foot Madill tower (two cases); Washington 078 grapple yarder; and Skagit GT3 grapple yarder.

The observations represent up to a week of detailed measurement of yarded piece sizes (logs or tree lengths), and elemental times (or work samples) at each operation. In addition, personnel in the co-operating firms completed and returned more than 500 shift reports on cable yarding activity.

The results are presented in detail for each case study, then summarized to allow comparison of the different operations. Mechanical Availability of the yarding machines was generally high, and it seems reasonable to aim for figures of 90% or greater. Machine Utilization varied from 42% to 87% of scheduled time, reflecting organizational effectiveness — particularly crew experience and motivation. Non-mechanical delays varied from 4% to 32% of scheduled time. These delays were largely the results of personnel and planning problems; controlling such delay requires close supervisory support.

Average total time per turn (work cycle) ranged from 2.6 min for the Skagit GT3 to 12.6 min for one of the Madill Mini-Spars. The net yarding cycle (outhaul, hook-up, inhaul, deck and unhook) comprised 50-60% of total time, yarding road changes 10-15% and delays 15-40%.

Average gross volume per piece yarded ranged from a low of 13 ft^3 (0.4 m^3) for the Koehring Bantam area to a high of 38 ft^3 (1.1 m^3) for one of the older, 70-foot Madill towers. The grapple yarders seldom produced more than one piece per turn, but the other machines averaged 2.1-3.1 pieces per turn. Only two operations achieved average (gross) turn volumes of 1 cunit (2.8 m^3).

Average log production ranged from below 100 to over 200 pieces per shift (8-hour basis), with the Skagit GT3 (223 pieces) and the Koehring Bantam (219 pieces) well in the lead. However, the small average piece size on the Koehring operation resulted in the lowest production recorded — 28 cunits (79 m^3) gross volume per 8-hour shift. On the same basis, the Skagit GT3 gross production was 67 cunits (193 m^3) per shift, and the other machines were in the 30-40 cunits (85-113 m^3) per shift range. The outstanding performance using the Skagit GT3 was achieved by a stable, though not long experienced company crew working in blocks of relatively high volume per acre and per tree that had been specifically planned for grapple yarding.

Estimated yarding costs for the different systems ranged from $14-20 per cunit ($5-7/m^3). The estimated cost of logs loaded on the truck ranged from $22-31 per cunit ($8-11/m^3). The grapple yarders occupied the low end of this range, while the two older 70-foot towers had the highest costs. These cable logging costs compare with current local costs for ground skidding systems of about $12-16/cunit ($4-6/m^3) on the truck (excluding access road cost in both cases).

Several problems delay the introduction of cable yarding systems in Interior B.C., including: lower productivity and higher cost compared to conventional ground skidding, which affect appraisals and stumpage payments; the scarcity of required planning skills and maps; the reluctance of contract loggers to invest in expensive, unfamiliar equipment in a cyclical and seasonal industry; insufficient numbers of experienced crewmen for the operations; and the lack of suitable methods for loading logs from small, sidehill landings.

FERIC plans to continue working with co-operating forest companies to monitor the performance of new cable logging systems as they are introduced.

Further details of this study appear in FERIC Technical Report No. TR-8 entitled "Evaluation of Cable Logging Systems in Interior B.C. and Alberta", by P.L. Cottell, B.A. McMorland and G.V. Wellburn. If you would like a copy of this report, please complete and return reply card.

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