

Helicopter Logging – Part 1

Keeping Power Lines Clear!

A helicopter equipped with a giant saw is an impressive sight. Designed specifically for vegetation management, the flying saw is used to trim branches and remove snow-laden limbs from power line corridors, helping to prevent electricity outages caused by trees coming into contact with overhead lines.

Helicopter saw technology arrived in Finland during the 1990s, following successful use in Sweden and the United States. Behind the introduction of these flying circular saws was one of the decade's success stories, Verkonrakennus Oy, together with its fearless pilot, Timo Ylitervo.

Finland's Electricity Companies Join Forces

In 1981, Lounais-Suomen Sähkö Oy completed the conversion of its medium-voltage distribution network in Paimio from 10 kV to 20 kV. The upgrade quadrupled transmission capacity across several municipalities and was part of a project that lasted almost fifteen years. During this period, electrical line workers were in particularly high demand.

Once the voltage conversion and transformer network modernisation projects had been completed, however, many skilled employees faced unemployment. To retain this expertise, a new company, Verkonrakennus Oy, was established.

Verkonrakennus Oy and the First Pole Installation Trial

On 14 April 1990, the Paimio-based companies Lounais-Suomen Sähkö Oy and Sähkölähteenmäki Oy (later ABB) combined their expertise to establish Verkonrakennus Oy, a company specialising in electricity network construction. Its operations were divided into overhead lines, underground cables and street lighting. At the time, independent network construction contractors were still rare in Finland. Many electricity companies were surprised by the idea of outsourcing work, as they had traditionally built and maintained their networks using their own employees.

Verkonrakennus Oy was also unusual because it adopted helicopters as a working tool. Helicopters were then a relatively new aid in the construction and inspection of electricity networks. The idea of using helicopters to erect utility poles was adopted from international examples.

In the late 1980s, the construction unit of Lounais-Suomen Sähkö Oy carried out its first helicopter-assisted pole installation trial on the island of Kemiönsaari. Five engineers and several line workers attended the demonstration. A pair of large gripping tongs was suspended beneath the helicopter on a steel cable to hold a 12-metre utility pole. No one had considered what would happen when the gripping mechanism was released. The pole toppled over and shattered into countless pieces. Although the experiment proved expensive and potentially dangerous, the team refused to abandon the idea.



Advertisement for Verkonrakennus Oy in *Sähköuutiset*, 1994.

The Helicopter as a Working Tool

Despite the unsuccessful first trial, helicopters soon proved to be invaluable. They were used for erecting utility poles, installing street lighting and stringing overhead power lines. Helicopters made it possible to place poles in remote forests without clearing large areas of trees and enabled motorway lighting to be installed with minimal disruption to traffic.

Around 70 % of Verkonrakennus Oy's work came from electricity companies, while the remainder was commissioned by road authorities and telecommunications operators. Yet the company's greatest breakthrough came with an entirely new helicopter application, one that demanded exceptional flying skills and nerves of steel.

Vertigo and Nerve – Operation Tree Trimming

Helicopter-assisted tree trimming was first developed in the United States in 1985. The purpose of the system was to prune trees along power line corridors, significantly reducing electricity outages caused by falling branches. Compared with traditional ground-based clearing, helicopter sawing offered major advantages. It was faster, produced a cleaner cut and could reach areas that were difficult to access from the ground. Previously, clearing long sections of power lines required dozens of workers and considerable time. Ground crews often spent around 90 % of their working hours simply moving between locations and only 10 % actually cutting branches. Helicopter sawing effectively reversed those proportions.

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Representatives of Verkonrakennus Oy travelled to Sweden to study the technique, where it had already become standard practice. Convinced of its efficiency, the company's board approved an investment of one million Finnish markka in the project. Based on Swedish designs, Hannu Oksanen, a mechanic at the Länsivoima workshop, built the saw. Initially, both the helicopter and the pilot were brought in from Sweden.



Photograph of the helicopter saw published in *Johdin*, 1994.

The finished machine featured a 20-metre-long boom fitted with ten circular saw blades, each approximately half a metre in diameter. Suspended beneath the helicopter, the boom allowed branches to be trimmed from the air along the edges of power line corridors.

The saw assembly was transported to work sites in a specially designed support frame. Ground crew members Olavi Koskinen and Jussi-Pekka Heikkinen were responsible for moving the frame and ensuring that no unauthorised people entered the work area. The pilot, meanwhile, had the demanding task of carefully lifting the saw from its frame, controlling its position in the air and carrying out the trimming operation with great precision.

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