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# KEEPING THE LIGHTS ON WITH DRONES

By D. RAJ and R.J. DEVAN

IF you see an unmarked vehicle in your neighbourhood, with strange men inside working at a bank of computers, have no fear. Just look up into the sky.

There will be no UFOs there. Only a drone filming the landscape from high above. And the men in the van are no CIA-types.

They are likely to be Tenaga Nasional Bhd engineers and technicians charting a new route to send electricity from where power is generated, for example Manjung in Perak, through the national grid to power up another remote part of the nation which needs power.

Modern technology has come to TNB. Decades ago, men trekked into jungles, staying there with tigers and wild animals for months to mark out the route the transmission lines would take.

Then, heavy machinery had to be brought in to cut the trees and clear vast areas for the transmission towers.

These days, though, technology allows engineers to chart the route on computers. And trees are felled only where necessary.

They are left at the site as no logging is allowed. It's modern – and it is green.

What's even better, the drone takes pictures from many angles, allowing computers to generate a 3D map of the area.

It can also map out the topography of the land.

From there, it's almost a cinch to draw up the route for the transmission lines from the national grid, the lifeblood of the country's energy needs, feeding power to every corner of the peninsula, to where there is not enough supply or to



Muhammad Ariff (left) and his team performing maintenance work on drones at TNB's Grid Strategy Department at Dua Sentral in Brickfields, Kuala Lumpur.



Isman with old toposheets and survey maps used by TNB to plan grid routes before the advent of drones.

where demand is higher.

Engineer Muhammad Ariff Abidin was among the first to harness the new technology in TNB.

He was an avid radio-controlled plane enthusiast.

Upon joining TNB's Land Planning Department in 2013, he put his skills to good use.

"It started with a home-made drone because professional equipment was expensive," he said.

He and his team flew a fixed-wing model aircraft with a camera attached.

They had to customise some of the parts and re-engineer the trigger mechanism so they could switch the camera on and off remotely.

The venture was successful and professional multi-rotor drones came into use. These can fly distances of up to 10km and provide

high-quality pictures.

The drones are used to check transmission corridors, allowing TNB to monitor land management, like vegetation under the towers, overgrown trees, encroachment and even landslides.

The technology does not just protect the grid – a sensitive and vital national possession – but also protects people who live in its surroundings.

That is why there are plans to use thermal cameras on the drones, which would allow TNB to see what's happening under the tree canopy.

They will be able to see water channels and soil conditions, and determine land boundaries to prevent disputes.

Potential problems can then be identified immediately and nipped in the bud faster for more reliable

and secure supply of power.

It's all a far cry from the way things used to be.

Isman Shafie, who has been with TNB for 32 years, worked with "toposheets" the company once used. These are old-school maps from the Department of Survey and Mapping.

TNB officers laboriously drew lines, often using pins and strings, across the map, trying to steer away from towns and villages.

With little other information, it was tough and TNB had to put in a lot of effort before it could be accurate. But now it is much easier with drones.

The lines running across the Main Range were the hardest, said Isman. The men had to spend months in the jungles and there was no telling what lay ahead.

"Today, they know where the

lakes, steep rises and valleys in the jungle are from 10km away but back then, the men only knew it when they got to the spot," he said.

There have been occasions when the surveyors got lost, and had to sleep for days in the jungles.

Once, a survey team refused to go into the jungle where a tiger was spotted.

"We had to hire a forest ranger before they would go in," said Isman.

And it's not just jungles. These men have even had to plan transmission lines across water, an example being the line from Pantai Siring to Pulau Besar in Melaka.

There are 12 transmission towers along a 4km stretch of sea, a real engineering feat.

You can see it on Google Map's satellite view.

Or better yet, with a TNB drone.