

By Joseph Mudingu

The New Forests Company's pole treatment plant located in Nyanza District in the Southern Province of Rwanda was established in 2014 and sits on 11.06 hectares with a capacity to hold about 450,000 poles, employs 62 workers including 26 permanent staff members while the rest are casual workers.

The establishment of the pole treatment plant in Nyanza has had a major impact on the population in the area. "The plant has given jobs to many residents here in Nyanza, also the neighbouring villages received electricity from NFC support and boosting business activities through consumption of different consumables by the plant and our staff" says Joseph Munyarukaza, the Corporate Social Responsibility Programme Manager of NFC.

Nyanza plant treats electricity poles and is the first company of its kind to venture in Rwanda. Most of the electricity poles are procured by Rwanda Energy Group and are supporting the country's electrification targets.

In spite of the availability of options for the transmission and distribution of electricity, wood poles remain the most preferred. Experts are of the view that although other options may have fair share of the market, wood poles still dominate. Treated wood poles are the market leader in lower voltage transmission and distribution utility poles. Not only because it is cheap, but because for over 100 years treated wood poles proved to be most reliable with high quality performance.

At the plant, Munyarukaza emphasises that NFC is very keen on safety measures and insists that a truly safe workplace is everyone's responsibility and that Safety Rules complement your own experience and knowledge of working safely around the pole plant. "They govern the way we work so that everyone - employees, visitors, and suppliers - comply with these safety precautions and procedures. By adopting and applying the Rules, we can all help mitigate safety risks" he adds.

Production process of treated wood poles

The pole production process at Nyanza pole treatment plant can be described in six main steps from when tree poles are collected to the time they are treated and ready to transport away.

Pole collection

The plant gets its supply of poles for treatment from local suppliers and from neighbouring countries like Uganda, Kenya, Congo and Burundi. The poles that conform to the standards of NFC are transported on trucks and delivered to the plant. The company offers expertise training to its local suppliers on how to identify the right poles in order for them to deliver poles that will not be rejected thus reducing losses. About 90% of the poles that are received for treatment at the plant come from suppliers. "We hold meetings with our suppliers every three months where we give them a document and take them through the required specification" explains Patrick Inshuti, the Pole Preparation Supervisor.

The Pole Graders help at this stage, they are chosen according to their level of literacy and who have had previous knowledge but given in-house training on how to identify different species.

"When it rains, there is a challenge to get poles from the forest because roads become impassable and we maximize by transporting a lot of poles during the dry season like 500 poles a week from our own concession" he says.

Receiving yard

At the initial stage, newly harvested poles from the forest that arrive at the treatment plant are taken to the receiving yard where they are counted and recorded in the registrar depending on their origin.

According to the pole receiving supervisor Clemence Ndikubwayo, at this stage the poles are checked for moisture content that determines the amount of water in the wood and after, they are staked according to their origin and moisture content.

All details about delivery is captured here including the defective poles that are rejected, then quality specification form is made which suppliers use to make invoices and to receive payment for their deliveries.

The received poles are then graded by use of markers into varying customer specifications and grades.

Stacking

Poles are stacked in the open air according to grades or customer specification to dry. Depending on the size of the pole, weather conditions and place of origin, open air drying can last from four months. Here moisture content monitoring is done from

50% in first week to 25% thus losing 2% water per week.

Open air drying has been the traditional method but there now other technologically advanced methods of drying to shorten the drying time between 7 to 10 days. Nyanza pole plant is in the process to start using these alternatives that include vacuum chambers, warm-air kilns or high temperature kilns.

Pole preparation

Egide Ruhumuriza, the Nyanza Plant Foreman notes that, at this stage poles are subjected to peel to remove the inner bark in order to make the surface smooth and even.

Here all customer specifications are executed before treating the poles, for example; pole markings, drilling and any other fabrication required by the customer.

Pole dimensions, moisture content and quality are also checked in accordance with acceptable standards. "Prior to treatment, poles are trimmed to ensure flat tops. Both tops and butts are fixed with galvanized gung nails (anti split plates) to prevent them from splitting," says Ruhumuriza.

Pole treatment

The poles are treated with chemicals that will prevent from insect attack and to last longer. Depending on customer specifications, the treatment chemical used could vary between creosote and copper.

Two different preservatives are applicable: creosote and chromated copper arsenate (CCA). For either, to allow complete impregnation, all sapwood must be dried to moisture content (MC) below fibre saturation point (FSP) prior to treatment.

Any remaining free water would directly prevent full penetration as well as evaporate and expand in the inner part of the pole due to the heat being raised to ca.120 °C during the creosote preservation process.

According to the treatment plant operator Clarisse Abayisenga, they measure and mix quality chemicals with water after sucking the air from the Vacuum tank which they later flood to 90% and put in the poles and close the tank for 30 minutes. "We balance the pressure and remove the chemicals and the total cycle of the treatment

takes one hour and 45minutes then another batch of poles is loaded” Abayinsenga explains.

Dispatch yard

From the fixation yard after treatment, poles are staked according to size and customer specifications since they are now finished product and arranged ready to be dispatched to the client.

The final inspection of the poles is done and approval for the quality of the finished product is conducted at the dispatch yard. Nyanza pole plant has the capacity to treat 120,000 poles in a year.

Sustainability of the plant

Since the cost of production is most of the times the top consideration when establishing electrical networks, wood will continue to dominate.

Apart from cost, even when other factors like performance life, post-construction expenses for inspection, maintenance, repair, replacement and disposal are examined; wood poles still reign.

A further enthralling reason for wood poles are preferred is environmental friendliness. Wood resources are harvested from nature and in properly managed forests, the renewability can continue for a long time. As such, harvesting wood does not pose significant threat to the environment.

After harvesting, they are impregnated with chemicals through a simple process at the treatment plant. The amount of energy used, and the emissions to the environment is one-quarter to one-tenth for steel, plastic or concrete.