



Published Bimonthly in Collaboration with Ethiopian Electric Power

Sebeta-1: City electricity provider substation

BY EPHREM ANDARGACHEW

Electric substations are essential part of the transmission system for electrical power. They serve as hubs for transferring electricity between different voltage levels and ensuring the efficient distribution of power to consumers. They can vary in size and complexity, depending on the specific requirements of the transmission system they serve. They can be located at various points along the transmission network.

Ethiopian Electric Power (EEP) has been mandated to generate and transmit electric power. Accordingly, after electricity is produced by power stations, it goes through various processes before reaching consumers. For example, after entering the switchyard, the generated power is transported through the power transmission line to the substation.

Among others, the Sabata-1 substation plays imperative role in providing electricity power for Addis Ababa. The substation is more than fifty years old. The substation had a small capacity when it started operating.

Sebeta-1 Sub-Station In-charge Daniel Alemu said that when the substation started operations, there were only two transformers and five outgoing lines. Nevertheless, EEP has been doing expansion and upgrading works by its



Daniel Alemu

own force department and foreign companies namely Sigma, Kank, and Sino-Hydro in the past eight years.

Due to the growing electricity demand, the capacity of the substation has also increased to provide the produced energy to the required place in an appropriate way. For the station to be able to respond to customer requests, its transformers and layout lines were installed that could carry the necessary power. The substation previously had a 63 Megavolt Ampere (MVA) transformer and used to provide 125 megawatts of power. However, after the expansion and upgrading work, it has now been able to provide 250 megawatts of electricity to customers, he elaborated.

Currently, the substation has 230 KV five intake lines, and four output lines of 132,000 KV, one 45,000 KV, six 33,000 KV, and 15 output lines of 15,000 KV. These power lines are given to Ethiopian Electricity Utility,



Technician Amanuel Senbeto

industries, factories and customers that require high power, he added.

The upgrading work made the previous 132 Bus Bar line into dual which is important alternating power-carrying lines during maintenance. The pairing of the bus bar helps to prevent the line from getting crowded, overloaded, and generating heat, he mentioned.

Besides, the upgrading work enables the carrying capacity of the lines to be increased. The substation is also using modern technology and advancing digital practices that eliminate backward techniques and practices. The substation provides power to four substations in and around Addis Ababa. After the power is entered into the substations, it is stepped down by different transformers and given outgoing lines.

The substations are connected via the national

grid. Whenever any power blackout occurs in one place, the customers get power from another substation. This in turn plays a role in stabilizing the power shortage and fluctuations in the area.

Sebeta-1 Sub-Station Technician Amanuel Senbeto in his part noted that the substation operates 24 hours and inspections are done every morning at 4:00 am and afternoon at 11:00 pm. Every hour, the substation workers collect and read data about the general operation of the site from three locations. If the employees observe any problems, they will maintain the problems via their ability. If the problems exceed their capacity, they will be reported to the maintenance department.

The substation employees are empowering their capability, and ability with the required knowledge through training, technology transfer, and experience. This in turn helped them to provide immediate responses in case of sudden power disruption. Through inspection, they can also replace broken items, cut wires, and take precautions to avoid electrical fire.

They will take the required precautions to prevent customers from losing power and the EEP from losing revenue due to line interruptions. In this regard, they have expertise working together and supporting one another with the electricity service.

Ethiopia's Electric Power Startup Process