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Joint Feeder Development Planning

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Abstract— *In the process of distributing electricity to the distribution network, a feeder is needed so that electricity can reach customers properly. In this distribution, there are usually feeders that are coordinated or operated together so that the reliability of electric power can be better and the number of disturbances or blackouts can be reduced. To coordinate or operate the feeders simultaneously, it is necessary to build a joint feeder. Joint feeders are usually used to maneuver the electric power network so that the distribution of electricity to customers can continue without blackouts.*

Keywords: Electric Power System, distribution network, joint feeder, feeder

1. INTRODUCTION

In this modern and sophisticated era, electricity is a necessity that cannot be separated from people's lives. All groups of people need electricity, from small children to adults. Starting from ordinary people to high-ranking state officials all need electricity. It is conceivable that if the electricity goes out for just five minutes, the impact will be felt for us. However, if the electricity is not disturbed then we will use the electricity arbitrarily and wastefully.

PT. PLN (Persero) is the State Electricity Company in charge of meeting the electricity needs in Indonesia trying to improve its quality. PT. PLN (Persero) always makes new breakthroughs to avoid blackouts so that the distribution of electricity to consumers can run well. One of the methods used by PT. PLN (Persero) to anticipate frequent blackouts is to build a joint feeder.

*Joint feeders*namely combining two or more feeders to be able to coordinate while distributing electricity to consumers. The construction of the joint feeder is intended to increase the reliability of the system during the distribution of electric power. With a joint feeder, the disturbed feeder or feeder can be transferred to the jointed feeder so that blackouts can be avoided.

2. DESIGN METHOD

2.1 Distribution Network Planning

The planning of the electric power distribution network system is an essential part in overcoming the rapid growth of electric power. Planning is needed because it relates to the purpose of developing a distribution system that must meet several technical and economic criteria.

This distribution network system planning must be done systematically with an approach based on load forecasting to obtain an optimal service pattern. Such systemic planning will provide a number of alternative proposals that can be assessed for their consequences which are directly related to reliability and economics.

2.1 Joint Feeder Development Requirements

*Joint feeders*is not carried out on any feeder but has certain conditions to be able to operate optimally. The requirements for the feeder to be jointly must have & consider:

a. The phases in the feeder to be joined must be the same.
b. The frequency of the feeders to be joined must be the same.
c. The stress on the feeder to be jointed must be the same.

2.2 Survey Results

Factors that are considered for planning the construction of a joint feeder are:

a. The load on the KLS01 feeder has reached > 250 A.
b. Difficulty in maneuvering or delegating loads in the event of disturbance or maintenance.
c. The SAIDI and SAIFI figures are quite high.

d. Location Selection Factor

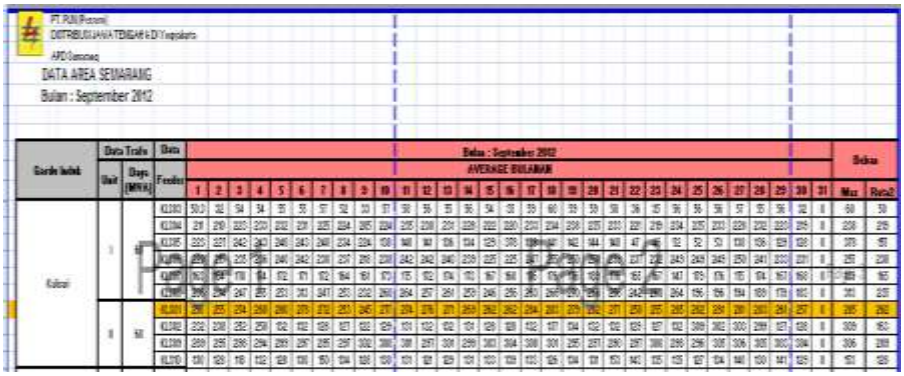


Figure 1. Feeder Average Load Data KLS01

During the field survey we obtained the following data:
The construction of the KLS12 feeder has a distance of 2035 meters which will start from GI Kalisari and go through Jalan DR. Sutomo, Jalan HOS Cokroaminoto, Jalan Suyudono, Jalan Sugiyo Pranto, enter the courtyard of the women's prison and finally on Jalan Indraprasta and there will be a 50 kVA transformer

3. RESULTS AND ANALYSIS

a. Creating a Joint Feeder Network Image

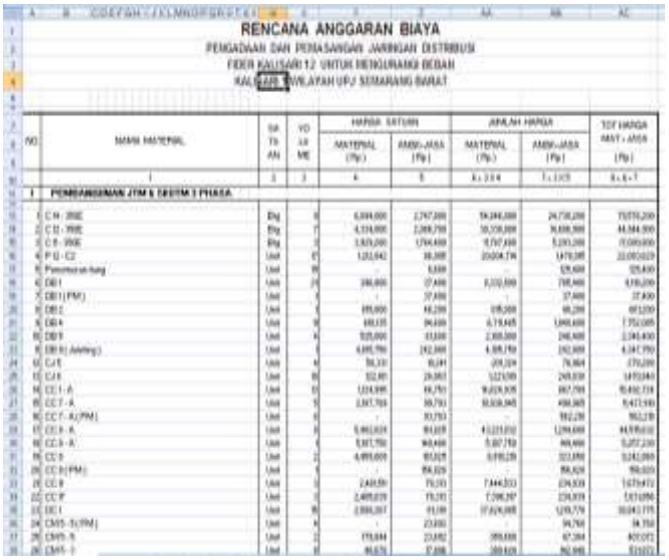
The next stage after the field survey is to draw a network sketch to facilitate the construction of the joint feeder. In this stage of drawing a network sketch, we can make a picture and determine the location of the pole according to the distance we have taken during the field survey. In addition, when drawing a network sketch we can also determine whether it is necessary to add a new network construction or not to support the construction of a joint feeder. In the process of drawing this network, it is usually based on the data we have obtained during the field survey. At the time of drawing the network, we also determine at the same time what construction or accessories we will use when constructing the joint feeder.
The following is an example of a sketch of a new network for planning the construction of a joint feeder. Because in this report we take an example of a joint feeder construction plan between KLS01 and KLS12 feeders, the picture below is a picture of the joint feeder plan for the feeder in accordance with the drawing we have made.
The picture above is an example of a joint feeder planning sketch between KLS01 and KLS12 feeders, for a complete picture, we can see the attachment

Figure 2. Joint Feeder Development Planning Sketch

b. **Compile**Shopping budget plan

Because in the previous stage we have known and determined what construction and accessories we will use in the construction of the joint feeder, the next stage is the preparation of the Expenditure
Budget Plan or what we often call the RAB. The preparation of this RAB is based on the drawings we have and the price has been determined by the Central PLN.

In the preparation of this RAB, we simply list out what equipment we need in the construction of the joint feeder and then we enter the existing price list into each equipment. After inputting all the price lists and the number of items needed, all we need to do is multiply and add them up. Thus, the RAB is ready to be submitted to the Distribution Office.
The following is an example of the preparation of the RAB.



RENCANA ANGGARAN BIAYA

PENGADAAN DAN PEMASANGAN JARINGAN DISTRIBUSI

Figure 3. Example of Making RAB

c. Operational Feasibility Study and Financial Feasibility Study

An Operational Feasibility Study and a Financial Feasibility Study are absolutely necessary in the construction of a joint feeder as well as the construction of other new networks. An Operational Feasibility Study and a Financial Feasibility Study are needed as benchmarks later if the joint feeder has been built or has even been operational. With an Operational Feasibility Study, we can find out

what reasons are behind us in the construction of a new joint feeder. Meanwhile, with the Financial Feasibility Study, we will find out how much profit we can get after the joint feeder that we have planned to operate, and with the Financial Feasibility Study we can also find out how long it will take to return the capital used for the joint feeder construction.

4. CONCLUSION

The conclusions that can be drawn from this design are:
In planning the joint feeder development through several stages, starting from observing and forecasting the need for electricity distribution, field surveys, drawing a sketch of the network plan and determining its construction, preparing RAB, making KKO and KKF, submitting to the distribution office, and finally delegating work. to the construction sector or partners of PT. PLN (Persero). The construction of a joint feeder is used to make it easier to maneuver the network in the event of a disturbance or maintenance. Joint Feeder is done by looking at the current load. In addition, the joint feeder is also one of the most effective ways to reduce the number of SAIDI and SAIFI.

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