

11 kV Feeder Analysis Using GPS mapping for Improving the Network

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Abstract—Due to complexity and heavy density of 11 kV distribution system, it becomes very difficult to map it manually for improvement point of view. In this research work the proposal is to do the load flow studies for the 11 kV Aminagar Sarai feeder which is situated in Baghpat District of UP India. The mapping for this feeder was carried out using GIS technique using MAPSOURCE software tool. The data collected contains length of 11 kV feeder, capacity/conductor type and loading conditions. This data will then be used for betterment of existing network by means of improvements in transformer loading, conductor resizing, change in conductor and VAR compensation etc.



1 INTRODUCTION

GPS is a space based satellite navigation system that provides location and time information in all weather conditions anywhere or near the Earth where there is unobstructed line of sight to four or more satellites.

First of all we have used GARMIN GPS module to mark the desired locations. Then after it will be interfaced to MAPSOURCE software tool to map the marked locations. We can also export drawn map to AUTO CAD for better monitoring.

The work flow will be as follows;

1. Identification of particular 11 kV feeder of substation.
2. GPS points will be marked at Substation, DTs, turning, tapping and finishing end of the feeder.
3. A rough sketch of the network will be made on the spot.
4. The data taken will be filled in a given format.
5. The data taken will be then exported to the MS Excel worksheet for better future monitoring.
6. The existing model will be simulated for the desired outputs.
7. Improve the results as per the requirements.

2 SYSTEM STRENGTHENING

1. Strengthening of sub-transmission and distribution network in the urban areas.
2. Metering of distribution transformers /feeders / consumers in the urban areas.
3. IT enablement of distribution sector and strengthening of distribution network as per CCEA approval dated 21.06.2013 for completion of targets laid down under Restructured Accelerated Power Development and Reforms Programme (RAPDRP) for 12th and 13th Plans by carrying forward the approved outlay for RAPDRP to IPDS.

The scheme will help in reduction in AT&C losses, establishment of IT enabled energy accounting / auditing system, improvement in billed energy based on metered consumption and improvement in collection efficiency.

3 INTERFACING OF GARMIN GPS DEVICE TO MAPSOURCE SOFTWARE TOOL

The interfacing of the GPS module to MAPSOURCE as simple as any other software tool. Just connect the module to the PC. Go to file menu. Then go to open file and provide the path for the desired file you want to explore. Now select the drawing tools to connect the tow more desired GPS points as per

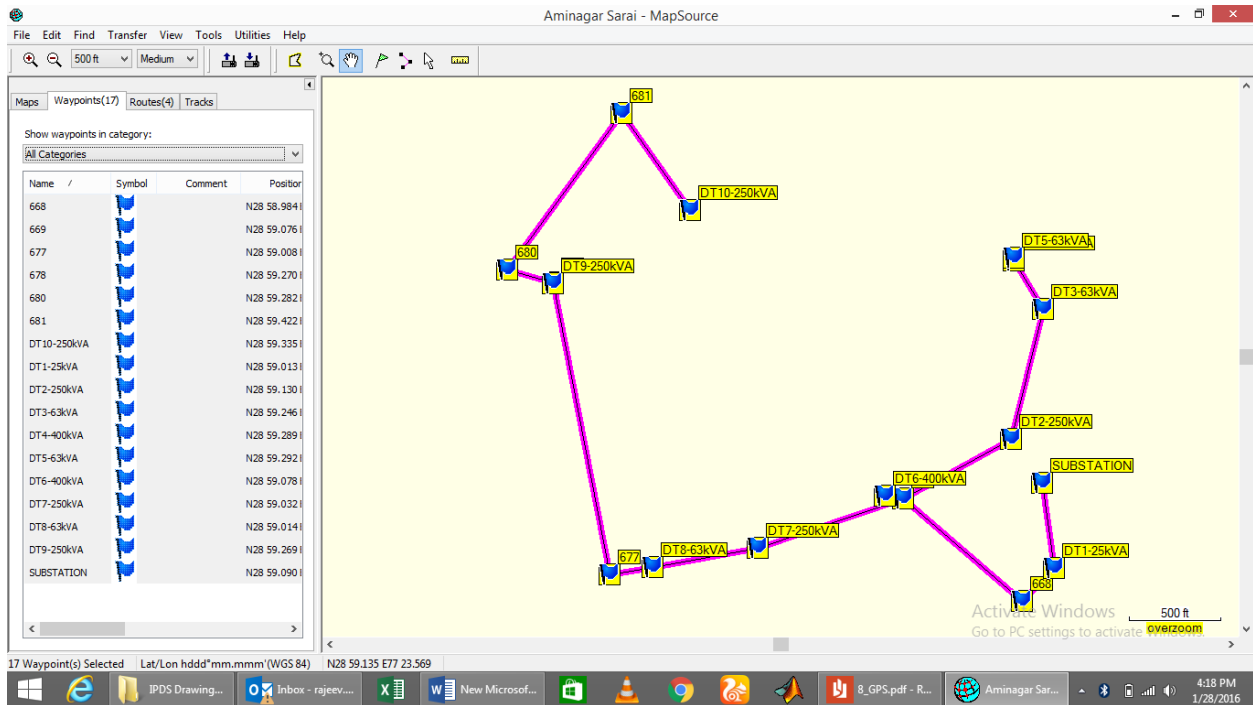


Figure.1

the hard copy of network map which we had drawn manually.

The same points directly can be exported to the AutoCAD tool.

The same is shown in figure 1 and figure 2. The network shown in figure 1 is connected in MAPSOURCE itself while the network shown in figure 2 is connected using AutoCAD

4 EXPORTING THE MAP TO AUTO CAD

The main advantage of importing the map to AutoCAD is that the monitoring becomes easy. In MAPSOURCE tool one cannot change the color of

the feeder. It becomes difficult to identify if there are more than one feeder in a network. In AutoCAD to many other features are there which can be used to make the drawings simpler.

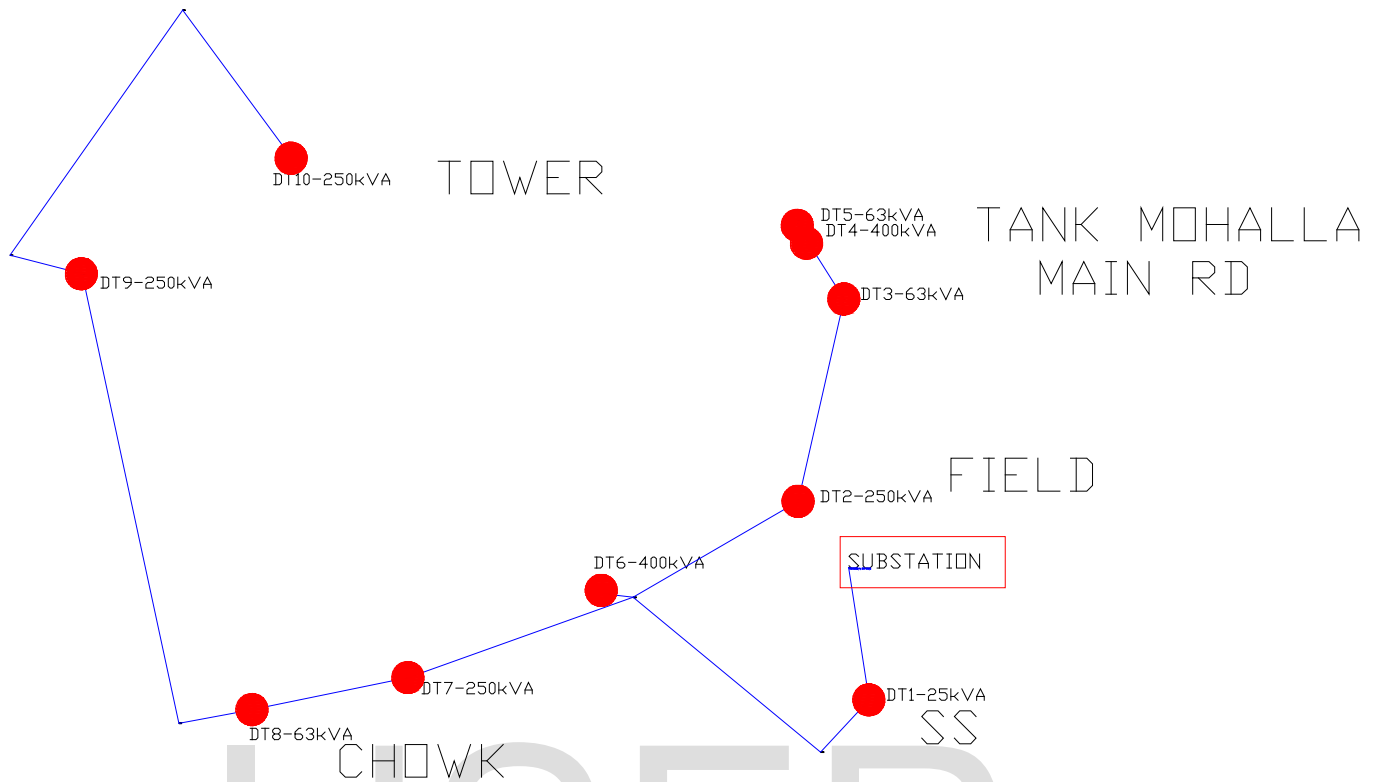


Figure.2

3 CONCLUSION AND FUTURE WORKS:

In this work we have taken the desired data and mapped it accordingly. Now in future works we can make a proposal as per the requirements to improve the existing network. In future work a proposal analysis will be taken in to consideration and also the proposed work will be shown using AUTO CAD drawings itself.

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