THE INFORMATION SYSTEM FOR POWER DISTRIBUTION AS ANSWER ON NEW DEMANDS IN SMALL POWER DISTRIBUTION SYSTEM

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INTRODUCTION

This paper briefly explains information system which we made for “Elektrodistribucija” Kraljevo. Old information system contains accounting; billing system, part of technical information system. Our new information system (in next text Digi TIS) is 21st-century Windows-oriented software package for performing all technical tasks in distribution utilities in an efficient and optimal way. This modern software tool enables the distribution utility’s staff: to get high-quality knowledge about their own distribution network, to design and manage the network’s power and automation equipment in order to maximize the quality and quantity of the electrical energy supplied to the consumers and to maximize the profit (revenue) from the investments spent for this equipment. Digi TIS is modularly organized package with three-tier software architecture. In this way, Digi TIS could be very easily sliced, customized and tailored in full accordance with customer requirements. Digi TIS is based on standard software solutions that enable its very simple integration with other standard software and hardware equipment applied in the environment of electricity distribution. Digi TIS is build onto old information system and present unique information system

OLD INFORMATION SYSTEM

Information system in my company contains human resource information system, billing system, customer information system, accounting information system. Old information system is good for old power system, but in new age, we must reduce risks, support new roles/rules and improve end-customer satisfaction , reduce cost and maintain acceptable quality of supply increase efficiency and maintain acceptable safety, increase utilization of existing assets. We can’t attain with old information system.

THREE MAIN PROCESSES

The picture 1 represents three main processes in power distribution system. The first process network market contains sub process billing, accounting, metering & reporting, and network access agreement. The second process network operation contains sub process control, planning and supervision of network. The third process network asset management contains sub process network calculation, project management for new object, documentation for all network elements, network plan and logistic. The new information system must include this three main process.

PYRAMID FOR ELECTRIC POWER NETWORKS

The picture 2 represents control hierarchy for electric power networks, on top of pyramid is information system (IS) information system contain geographic information system (GIS) and customer information system (CIS) this level is very important for utility, we must know where is located our customer because possible fault at customer. Second level is network level; this level contains energy management system (EMS), supervisory control and data acquisition (SCADA),
distribution management system (DMS) and load management system (LMS). This level is important for control and operates of system. The next level is substation level with substation remote terminal unit (RTU). This level is also important for control and operates of system. The fourth level is distribution level with feeder automation. Feeder automation contains distribution terminal units (DTU), intelligent electronic devices (IED) and communication with mid-voltage substation. The bottom of pyramid is consumer level; this level contains metering device and communication with this device. This level is very important for billing system and payment.

OUR VISION OF POWER SYSTEM AND DIGITALIS

Control center (dispatcher center) is main point in our vision of power system. Over dispatcher center pass most information and dispatcher make most important decision. We can see several parts of information system for power system. Old information system as you see contains some parts, accounting, sales (billing system) and asset management as new information system. Our new information system connects all process from this picture.

CHARACTERISTICS OF INFORMATION SYSTEM DIGITALIS

The information system has next characteristics:
The information system created by Visual Basic 6
The graphical user interface (GUI)
The multi-user system with lot various functions and views
Oracle 7 database management system
File server on Windows 2000 for all drawing for all format (DWG, JPG)
On picture 4 we can see what DigiTIS contains. DigiTIS contains five main parts; mapper, analyzer, designer, customer and operator. Documentation as part of mapper contains documentation for electrical objects, electrical schemes of power station and other electrical object. Program allows connection between schemes and numeric form database. For all object program creates X, Y, Z coordinates for connection with GIS. Subprogram analyzer made Institute “Nikola Tesla” Belgrade; this program contains many options and fully connects with dynamic mimic diagram. Subprogram designer contains program with the help of manager issues a working directive on the basis of all facts and plan of maintenance. Program records time and materials for all working directive, and contains part for analysis of cost according to the objects or the type of objects. On the basis of recording fault, program gives information for department of maintenance and department of investment. Subprogram customer is program from old information system which is fully connected with DigiTIS. Program customer gives many various reports, e.g. address, type of connection, electrical permit, date of attach to power network, x and y coordinates, type of device for measurement and consumption of electric energy. Subprogram operator contains all programs for dispatcher.

CONCLUSION

Very minor number of the information system for power distribution on south-east Europe and underdeveloped countries has technical information system, business information system; geographic information system, billing system and accounting system unite into unique information system. Working on developing into this power distribution system is very hard; they have small information for their system. Our information system can be solution for many small power distribution systems.