Project name:
"System for bushing monitoring with a view to preventing ecological disasters caused by high power transformer damaging"

Contract no. 155/20.07.2006

Stage: II. Finalizing the solutions; drawing up the execution documentation for functional models, drawing up specialized software, purchasing equipment.

Objectives:
- Finalizing the solutions; drawing up the execution documentation for capacitive current and reference voltage measuring transducers;
- Drawing up the execution documentation of the microprocessor-based unit for adapting and processing the reference quantities;
- Drawing up the execution documentation of the functional model of the central unit for processing and storing the monitored quantities;
- Drawing up specialized software for acquisition, processing and storage, creating a data base with the monitored quantities;
- Drawing up PC communication software;
- National and international communication and publication.

On the basis of the study achieved within the Stage I, it was drawn up the execution documentation for functional models on which the tests and verifications for demonstrating the functionality will be performed.

The activities from the achievement plan of the project were approached, resulting within each activity the execution documentation for functional models.

Activities :

Activity AII.1 Finalizing the solutions; drawing up the execution documentation for capacitive current and reference voltage measuring transducers. The theoretical aspects were defined, establishing the quantities which characterize the capacitor bushings. Measurements of electrical capacity (C) and dielectric dissipation factor (tan δ) are important parameters for assessing the functional condition of a high voltage bushing. For monitoring the quantities, the phase difference between the bushing reference voltage and the bushing capacitive current is measured.

Activity AII.2 Drawing up the execution documentation of the microprocessor-based unit for adapting and processing the reference quantities. Starting from the basic structure of configurable digital equipment, the execution documentation of the microprocessor-based unit for adapting and processing the reference quantities was designed.

Activity AII.3 Drawing up the execution documentation of the functional model of the central unit for processing and storing the monitored quantities Starting from the base structure of configurable digital equipment, the execution documentation of the microprocessor-based unit for processing and storing the monitored quantities.

The central processing unit of a data acquisition system should perform the following functions:

- Selecting the analogue channel on which the acquisition is presumed to be done;
- Controlling the sampling;
- Controlling the analogue-digital conversion;
- Sensing the conversion end and reading the binary code resulted;
- Loading the code in memory;
- Correcting the errors entered by different component blocks;
- Processing and displaying the data;
- Testing the component blocks with a view to identifying the faulty ones.

Activity AII.4 Drawing up specialized acquisition, processing and storage software, creating a data base with the monitored quantities

Facilities:

- Calculating the phase difference and effective value for the 6 phases;
- Determining tan delta for each of the 6 phases;
- Activating digital outputs corresponding to the exceeding of the 2 alarm thresholds associated to the calculated values of tan delta;
- Activating digital outputs corresponding to the exceeding of some alarm thresholds associated to the sampled current values;
- Storing in an archive the calculation results for allowing them to be subsequently consulted (by downloading them by means of a program on PC)

Activity AII.5 Drawing up software for PC communication

The program from PC allows communicating with the master device for visualizing the current values of calculated tangents, the level of leakage currents, for transferring the content of the stored archive, also for editing its functional parameters.

Activity AII.6 National and international communication and publication

Papers have been written and presented at national and international conferences, where diplomas and medals have been got

Within the framework of each activity from the project achievement plan, the specific documentation was drawn up and thus the proposed objectives were reached.

On the basis of the documentation drawn up within this stage:

Finalizing the solutions; drawing up execution documentation for functional models, drawing up specialized software, purchasing equipment,

one could pass to the following stage - achieving functional models, on which the tests and verifications for demonstrating the functionality will be performed.