The Third International Conference "Problems of Cybernetics and Informatics"
September 6-8, 2010, Baku, Azerbaijan. Section #2 "Intellectual Technology and Systems"
www.pci2010.science.az/2/34.pdf

SCADA CONTROL OF VIBRATION TECHNOLOGIC PROCESS

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Fulfillment of the technologic processes (TP) that is characteristic for continuous manufacture (power engineering, oil refinery, etc.) and continuous-discreet manufacture (metallurgy, manufacture of new materials, etc.) is provided with the maintenance of the required parameters of processed materials - from one side, and with the forming of these materials lines structure – from other side. Production line is the directed motions and processing of the material or energetic mediums by the technologic equipment. Oil in the oil production and oil refinery, or electric energy in power engineering can be shown as the typical mediums.

As a rule, control of the line technologies uses a developed automatics system (autoregulators, protectors, blockings, logic automats, etc.) that is integrated to the automatic control system of technologic processes (ACSTP).

At present time special requirements to the fulfilled processes accuracy are made. In this sense the vibration technique gives exceptional opportunities. For example, in case when an accurate weight or volumetric dosing of the granular materials – drugs components in pharmaceutical industry, cement in current production, sugar in confectionary industry, etc. – are required, vibration batchers with the electromagnetic drives (EMD) [1] are indispensable. The accurate dosing in the batchers is achieved due to the fact that at the moment of engaging the driver excites oscillations of a working body and as a result of this the transient processes are kept in period of one oscillation. As the replacements of working body after stopping of the driver are not more than 2-3mm, supply and stopping of product are fulfilled almost immediately. It causes high accuracy of dosing.

The various methods and facilities are applied for the control and regulation of the technologic data. At present time programming logical controllers and specialized software, controlling the programmed logical controllers and some time even a complicated system of automation of a department or full plant gain ground.

An efficiency of ACSTP is determined by the degree (level) of automation of the basic problems solved by the system that supposes usage of the special instrumental facilities – SCADA (Supervisory Control and Data Acquisition) [1,2].

The basic problem of SCADA system is provision of the interface of technologic process operator. Large number of the similar packages is oriented to the most systems. They can be applied for building, programming and configuring of the systems. Because of the requirements made of the SCADA systems, a spectrum of their functional abilities is determined and realized practically in all packages. The basic possibilities and facilities characteristic to all SCADA are the following:

- automated development that gives an opportunity to create a automated software system without real programming;
- facilities of collection of initial data from the devices of lower level;
- facilities of control and registration of signals about emergency conditions;
- facilities of information storage with the possibility of its post-processing (as a rule, it is realized through the interfaces to the most popular data bases);
- facilities of initial data processing;
- facilities of visualization of information as graphics, histograms, etc. [2,3].

Development of the modern SCADA system requires the large expenses and is fulfilled during the long time. That is therefore in most cases the designers of control application

software (AS), particularly of AS for ACSTP, go by the way of acquisition, development and adaptation of some finished, already approved universal instrumentation.

One of wide expanded software facilities is the SCADA system In Touch of the American firm Wonderware. The In Touch program package as any other SCADA-package consists of two basic components – frameworks of development and fulfillment. In the development framework symbolic circuits are created, input and output signals and parameters are determined and attached to the hardware, controlling algorithms are developed and rights of operators are designated. An attachment created by this way functions in the framework of fulfillment[3].

The SCADA system In Touch has more than 200 000 applications in the various fields of industry all over the world. In Azerbaijan the package is applied in metallurgy and engineering industry. The SCADA system In Touch is the part of Factory Suite Toolkit. The Factory Suite Software Toolkit of the Wonderware company is destined for the development of automation system for the industrial plants, inclusive all levels of production – from the control of technologic processes to the control of plant. The Factory Suite system consists of the following basic components, closely integrated to each other:

- In Touch – the SCADA system for the visualization and control of technologic processes;
- Industrial SQL Server – relational real time control system of data base for the intraplant application;
- In Control – package for the control of the controller equipment;
- Scout – facilities of monitoring through the Internet/Intranet networks;
- In Track – system of production control;
- In Batch – system of control of the dosing and mixing processes.

It is necessary to use the third component – a separate program called in-out server in order the attachment may exchange data with the apparatus. As a rule, the in-out server is oriented to be used with the concrete type of equipment as the industrial controllers. In case of necessity it is also possible to develop a new in-out server with the help of instrumental facility Factory Suite Toolkit.

The basic concepts of are the tags, a base of real time data (all continuum of variables and mechanisms of their interactions to each other and with the system part of In Touch), the objects (graphic objects and set of variables and animation relations associated with the objects), a working window (the window having the determined set of attributes and relating with the objects).

A variable in the In Touch (as in the most of analogical packages) is the variable in fact (that can be or not be connected to the external objects) and the set of its attributes. The attributes include such ones as availability of an alarm caused by variable values spillover the settings, value of the settings, a sign of alarm's receipting, group implement of variable, a comment, etc.

The base of real time data is not a certain standard base. It is a set of variables and rules of their interactions. It is interesting that it is possible, in fact, to save and process the In Touch data in the standard data base or electronic table (f.e., in Excel, Access), established connections through the DDE-interface between the In Touch variables and the variables of any program package.

Thus, an application of the In Touch package is characterized with low expenses for development, checkout and exploitation of the applied system; significant decrease of development time; exception of necessity to involve high qualified programmers; modernization of production till the most modern level; increase in quantity and improvement of production quality. It is approved by expansion of the In Touch package use in the various fields of industry: food, oil and gas, chemical, pharmaceutical, paper industries, in transportation, etc.

At present time the designers of SCADA system on the base of the Windows NT have new opportunity to use expansion of real time in order to avoid disadvantages of the Windows NT in the problems of real time. It is necessary to note the tensions of including of the SCADA

system into the systems of plant complex automation. It provides accurate, timely information on each level of production. Application of new technologies in the SCADA systems, development of instrumental facilities of plant complex automation are evident of tendency and possibility of firms-developers always to perfect their products that is an important factor at choosing of the instrumental facilities.

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