

1.12.20. INTEGRATED DIAGNOSTIC MONITORING OF HAZARDOUS PRODUCTION FACILITIES

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In modern economic conditions, reduction of costs for technological equipment operation and rectification of accident consequences is one of the main methods to improve profitability of enterprises of continuous production cycle in gas-and-oil, petrochemical and chemical branches of industry. Integrated sets of measures are developed and applied with the main purpose to provide in maximal degree the efficient and safety operation of equipment.

One of such measures provides installation of the integrated diagnostic monitoring systems at the most responsible facilities. It resolves the following tasks:

- Timely detection of structural defects with high completeness of testing;
- Acquisition and storage of data on technical diagnostics and prediction of changes in the technical state of structure in the course of time;
- Automation of technical diagnostics and reduction of the human factor role during evaluation of diagnostic results.

Determinant attributes for the necessity of application of the diagnostic monitoring:

- structure destruction can lead to significant material and ecological losses and even to human losses;
- there is no access to perform periodic inspection and testing of structure or such access is difficult;
- considerable volume of preparatory works and works related with periodic facility testing requires partial or complete stoppage of such a facility;
- structure is of low operational survivability;
- runtime between repairs of equipment must be increased;
- requirements of regulative documents.

Key point of the continuous monitoring consists in automatic mode the system operates in during the whole period of operation. Diagnostic data enter continuously into modules, where they are converted into digital form, processed preliminarily and then are transmitted to the central computer for final processing and presentation in real-time mode on a display in the control room. Display contains the main informational windows to output the following: monitored facility mnemonic diagram indicating locations of measuring and controlled devices, locations of defects (when they occur), values of measured parameters, detailed protocol of monitoring system and personnel actions, forecast of the current technical state of facility and recommendations on further operation.