

ПЛЕНАРНІ ДОПОВІДІ

CONTROL OF THE STATE AT INDUSTRIAL FACILITIES

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Modern means for monitoring the nodes state of complex technological units with the help of disassembled technologies comprise a wide class of objects. The main disadvantage of such equipment is either a wide range of possible control or diagnostic procedures (accompanied by low accuracy), or exorbitant price.

The authors worked on the development of hardware, algorithmic and software to determine the suitability for operation of the fuel system of diesel units (DU) [1, 2]. The control algorithm is based on monitoring the vibrations of the walls of the tubes inside high pressure fuel pump DU with the subsequent conversion of the time implementation into frequency through a continuous wavelet transform. The main disadvantage of such control is the large amount of calculations due to which only monitoring in batch mode is possible. Carrying out control and diagnostic procedures using discrete wavelet transform will allow implementing the corresponding procedures in real time.

Currently implemented: 1. Received time realizations from the vibration measuring channel (sensor AP18), which correspond to the serviceable and faulty condition of the DU fuel system. 2. The rationing of time realizations by signal amplitude is carried out. 3. Discrete wavelet transform of time signal by different parent wavelets is performed. 4. The correlation of frequency signals received by different parent wavelets is determined.

Now the plan for researching frequency signals based on variance and covariance statistical analyzes has been formed. To do this, it is planned to implement: 1. Finding and analyzing the Fisher's statistics (F_0, F_1, F_2, F_3) with different numbers of series for frequency dependences that correspond to the good and bad state of the DU fuel system. 2. Finding the statistical distance d between good and bad states of the fuel system DU for F_0 -statistics. 3. Finding the optimal number N pairwise statistical distances d .

References: 1. *Mygushchenko R.P.* Methods and devices for systems of multiparameter functional diagnostics of vibration objects (theoretical bases and implementation): dis. Dr. tech. Sciences: 05.11.13 / *Mygushchenko Ruslan Pavlovych.* - Kharkiv, 2014. - 475 p. 2. *Kropachek O.Yu.* Theoretical foundations of analysis and synthesis of computerized information and measurement systems for diagnosing dynamic non-stationary objects: dis. PhD in Technical Sciences: 05.13.05 / *Kropachek Olga Yuriyivna.* - Kharkiv, 2018. - 421 p.