A fault early warning method for auxiliary equipment based on multivariate state estimation technique and sliding window similarity

The running state of auxiliary equipment in power plants directly affects the economy and safety of power production, thus a data-based fault early warning method for auxiliary equipment is proposed. A multivariate state estimation technique with improved process memory matrixes is used to build the nonparametric model describing the normal state of the equipment. Different from the traditional process memory matrix, the improved process memory matrix utilizes the probability density equal interval sampling method to greatly increase the sampling density of the typical operating state and effectively cover the common working space. Instead of the traditional residual threshold method, the sliding window similarity of states is adopted as the evaluation criteria for early warning, which can better evaluate the normality of multiple fault-related variables in the state. This study takes a 300MW CFB power plant in China as an example, the proposed method are compared with the time series, fuzzy logic and traditional MSET methods. The result shows that the proposed strategy can most effectively predict the faults.

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