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**Regression Models of the Nuclear Power Unit VVER-1000 Using Data Mining Techniques****[☆](https://www.sciencedirect.com/science/article/pii/S1877050916323195" \l "aep-article-footnote-id8)**

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## Abstract

Due to plenty of changes in many interrelated processes at nuclear power plants there is the need to show which values of some parameters of the nuclear power plant with VVER-1000 are better. In this task data mining techniques can be introduced. In order to obtain regression models of nuclear power plant with VVER-1000 algorithms such as the Linear Regression, REPTree, and M5P were selected and the datasets were obtained by simulating two control programs in Simulink software. The study focused on such targets as the average temperature of the coolant in the first circuit and the output power of the power generator. This study demonstrates the good results of the correlation coefficients and the root relative squared error metrics in case of the improved compromise-combined control program in comparison with the control program with the constant average temperature of the coolant in the reactor core. In terms of the results the root relative squared error metric is less than 2.8% and the correlation coefficients had values higher than 99,95%. The use of these models can contribute to improving the understanding of the internal processes because using the best regression data mining models allows to see advantages of the improved compromise-combined control program.