A NEUTRONIC AND THERMAL-HYDRAULIC VISUAL COMPUTER CODE FOR TR-2

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A computer software system was developed to integrate various nuclear codes that are widely used in the analysis and calculations of the TR-2 Research Reactor. The system consists of an efficient and user friendly graphical user interface that creates and controls the input and output of the nuclear codes, presents obtained results in computer graphics and color maps to provide the user with the means to process them fast and effectively. Many details of modeling or analyzing a nuclear reactor is hidden or handled by the program to do the required calculations more easily and in less time. In the first stage of the project, neutronics codes WIMS and CITATION were incorporated into the system. Research reactor TR-2 was modeled, criticality and burnup calculations were carried out. A comparison with previous calculations and experimental results demonstrated the systems success. Next, a thermal-hydraulic module was added to interface nuclear codes PARET and COBRA. Static and transient calculations were conducted based on accident scenarios. Finally, the results are compared with other calculations and observations.

Keywords: Nuclear research reactor, computer codes, graphical user interface