

Development of 3D CAD System as a Design Tool for PEACER Development

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Abstract

In an effort to resolve generic concerns with current power reactors, PEACER[1] has been developed as a proliferation-resistant waste transmutation reactor based on a unique combination of technologies of a proven fast reactor and the heavy liquid metal coolant. In order to develop engineering design and visualize its performance, a three dimensional computer aided design (3D CAD) method has been devised.

Based on conceptual design, system, structure and components of PEACER are defined. Using results from finite element stress analyzer, computational fluid dynamics tool, nuclear analysis tool, etc, 3D visualization is achieved on the geometric construct based on CATIA[3]. A 3D visualization environment is utilized not only to overcome the integration complexity but also to manipulate data flow such as meshing information used in analysis codes. The 3D CAD system in this paper includes an open language, Virtual Reality Modeling Language (VRML)[4,5], to deliver analyses results on 3D objects, interactively. Such modeling environment is expected to improve the efficiency of designing the conceptual reactor, PEACER, reducing time and cost. Results of 3D design and system performance simulation will be presented.