

IV GENERATION REACTOR PROJET - SEISMIC ANALYSIS WITH FLUID ELEMENTS

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As for many projects, several mechanical and hydraulic studies are performed for the Fast Breeder Reactor (FBR) ASTRID project and particularly seismic analyses in order to check the good behavior of the reactor structures and to assure a high safety level. The reactor vessel is the most complex one to study because although it's an axisymmetric structure, the reactor vessel contains many components non axisymmetric (pumps, exchangers...) separated by fluids. A specific home code has been developed for the FBR SUPERPHENIX project and used until now to perform the seismic analysis on such FBR structure. But this old code is limited for axisymmetric structure and so the behavior of the internal components (pumps, exchangers...) cannot be taken into account accurately. For the ASTRID project a new approach has been chosen based on a 3D model with the modeling of each internal component. After many tests on simple structures issued from documentation or mockup tests, the SYSTUS code has been chosen to perform this seismic analysis. This presentation describes this new approach with the performed model (structure and fluid elements, coupling element, loading, boundary), the different steps on the seismic analysis and some interesting results.