

反应堆工程

核电站主泵机组地震响应谱分析及应力评定

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摘要 用三维实体建模软件Inventor建立某核电站主泵的三维实体模型。对模型进行简化, 灵活运用ANSYS的单元属性和接触功能, 建立有限元动力学模型。通过模态分析, 得出前13阶固有频率。在此基础上, 用SRSS振型组合法分析多地震谱、多角度下核主泵的地震谱响应, 得到了相应的应力和位移响应。对主泵进行静力学分析, 将地震动应力与静应力相叠加, 分析不同工况下主泵机组的应力值。按ASME规范进行校核, 结果表明: 应力值满足标准要求。

关键词 [核主泵](#) [地震响应](#) [有限元](#) [结构分析](#)

分类号

Analysis and Assessment on Seismic Response of Reactor Coolant Pump in Nuclear Power Plant

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Abstract Three dimensional solid model of reactor coolant pump was established. After the structure of the pump was reasonably simplified, the modal analysis was used to get the natural frequencies and mode shapes. On this basis, the spectrum analysis was used to get the stress and displacement response under three different direction spectra with multi-angles. In addition, static analysis of pump was used to get stress and displacement under different conditions. Finally, the seismic response results and static results were added up under different conditions to compare with ASME standards. The comparing result shows that the values meet ASME standards.

Key words [nuclear pump](#) [seismic response](#) [finite element](#) [structural analysis](#)

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