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5MW低温供热反应堆微沸腾运行启动可行性研究

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摘要 文章用RETRAN-02程序,对清华大学核能技术研究所设计和建造的5MW低温供热堆的微沸运行启动方式进行了较为系统的研究;分析了控制反应性引入速率、主回路蒸汽冷凝量大小及主回路对外总传热量的大小对启动稳定性的影响。结果表明,在一种新颖的启动方式下,只要对反应堆的某些特定参数作适当的实时控制,反应堆就能从单相向两相微沸运行方式稳定过渡。

关键词 低温供热堆 反应堆启动 两相密度波振荡

分类号

THE POSSIBILITY RESEARCH ON LOCAL BOILING STARTUP OF 5 MW LTHR

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Abstract Using RETRAN-02, the paper researches systematically the ways of lacalboiling startup of 5 MW Low Temperature Heating Reactor (LTHR), designed andbuilt at Institute of Nuclear Energy and Technology (INET) of TsinghuaUniversity. The affect of startup stability by the rate of control reactivityinsertion, the amount of vapour condensation of the primary collant system andthe amount of heat transfer of the primary coolant system are analysed. Theresult shows that, by a new type of mode of startup, the reactor can transitstably from single phase natural cycle to two-phase local boiling natural cycle mode,as long as some special parameters of the reactor are controled temporarily.

Key words Low temperature heating reactor Startup of reactor Oscillation of two-phase flow density waves

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