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反应堆工程

破前漏分析中泄漏率模型研究进展

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摘要 破前漏（LBB）分析对商业核电站承压设备的安全分析至关重要，并有许多突出的优点。目前，LBB在高温气冷堆上的应用尚不成熟，而提出较为精确的破前漏泄漏率模型是破前漏思想能否在高温气冷堆上得以应用的关键。文章主要概述目前各国破前漏分析中泄漏率模型方面的研究进展。通过分析各个泄漏率模型的基本假设，理论分析、计算流体力学分析、实验验证及应用实例，分析各模型的优缺点，理清各因素对泄漏率的影响，并筛选可能应用到高温气冷堆破前漏分析泄漏率模型中的合理部分，为后期高温气冷堆破前漏泄漏率模型研究提供建议。

关键词 破前漏 高温气冷堆 泄漏率模型 等温流 摩擦系数

分类号

Overview of Leak Rate Models for Leak Before Break Analysis

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Abstract Leak before break (LBB) analysis is very important to guarantee the safety of the pressurized equipments in a nuclear reactor. Although it has many advantages, it is not mature to apply in the gas cooled reactors (GCRs). To develop more accurate leak rate models are the key point for the applications of LBB analysis in the GCRs. Literature study was carried out concentrating on leak rate models proposed or used in LBB analysis. In each model, basic assumptions, equations for model development, experiments validation, numerical calculation and application examples were presented. From this literature study, key factors of leak rate models and their effects were analyzed and summarized, which give suggestions and instructions to new leak rate model development in the near future for the GCRs.

Key words leak before break gas cooled reactor leak rate model isothermal-flow friction factor

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