Thermal-Hydraulic Behavior of Multiple U-Tubes In a Reflux Condensation Mode

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ABSTRACT

A series of experiments were performed to investigate the thermal-hydraulic phenomena inside the steam generator U-tubes in a reflux condensation mode. A total of 512 data fir local condensation heat transfer coefficients(108 for pure steam flow and 404 for steam-air flow conditions, repectively) have been obtained for various inlet flow rates of steam and air under atmosoheruc condition. A new correlation, which includes the effects of flow rates of steam and noncondensible gases (air) on the heat transfer coefficient and is applicable to the reflux condensation mode, has been developed using the concept of degradation factor based on the steam-air experimental results. In addition, the effect of multiple U-tubes with different lengths(i.e., two-long and two-short U-tubes) on the onset of flooding during a reflux condensation has been examined