#### Accepted Manuscript

Research of multiple refined degree simulating and modeling for high pressure feed water heat exchanger in nuclear power plant

Meijie Gong, Minjun Peng, Haishan Zhu

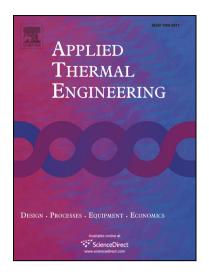
PII: S1359-4311(17)37498-7

DOI: https://doi.org/10.1016/j.applthermaleng.2018.05.005

Reference: ATE 12144

To appear in: Applied Thermal Engineering

Received Date: 24 November 2017 Revised Date: 23 March 2018 Accepted Date: 2 May 2018



Please cite this article as: M. Gong, M. Peng, H. Zhu, Research of multiple refined degree simulating and modeling for high pressure feed water heat exchanger in nuclear power plant, *Applied Thermal Engineering* (2018), doi: https://doi.org/10.1016/j.applthermaleng.2018.05.005

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

## **ACCEPTED MANUSCRIPT**

### Research of multiple refined degree simulating and modeling for high pressure feed water heat exchanger in nuclear power plant

Meijie Gong, Minjun Peng\*, Haishan Zhu

Fundamental Science on Nuclear Safety and Simulation Technology Laboratory, Harbin Engineering University, Harbin 150001, China

**Corresponding Author:** Minjun Peng

Address: Room 440, Building 31, Harbin Engineering University, St. Nantong, Nangang District,

Harbin, Heilongjiang Province, China

**Tel:** +86 13624600528 **E-mail:** heupmj@163.com

#### **Highlights**

- 1. A refined simulation model for high pressure feed water heat exchanger is developed.
- 2. Large number of control volumes based on the detailed structure with tube bundles and partition plates.
- 3. Dynamic thermal and flow calculation in the high pressure feed water heat exchanger.
- 4. Parameter distribution and tendency by the simulation model.

#### **Abstract**

High pressure feed water heat exchangers (HPFWHX) are essential equipments in the nuclear power plant (NPP) secondary loop. Because of the different requirements for the HPFWHX, there are the multiple degrees of refined simulation model developed in this work. The high fidelity simulation model is based on the practical physical structure with the tube bundle and partition plates. Large number of control volumes are divided by partition plates and tube bundles in the steam condensing zone and drain water cooling zone. To test and verify the simulation model, we utilized the main design parameters of No.7 HPFWHX in Qinshan II NPP. The steady state parameters are suitable for limiting model error and increasing its accuracy. Two dynamic conditions are chosen to verify the characteristics of the simulation model. Verification result shows that the dynamic processes are consistent with the theoretical basis used for the analysis. Also, the simulation model provides the parameter distribution and the dynamic state of the major HPFWHX parameters in the normal operation. The simulation model could assist researchers to determine and analyze the thermal features of the HPFWHX with fast calculation speed. The simulation model is also useful for the simulation of similar tube and shell heat exchangers in different conditions.

## **Key words:**

High pressure feed water heat exchanger (HPFWHX); Structure refinement; Dynamic process; Parameter distribution.

#### Download English Version:

# https://daneshyari.com/en/article/7045033

Download Persian Version:

https://daneshyari.com/article/7045033

<u>Daneshyari.com</u>