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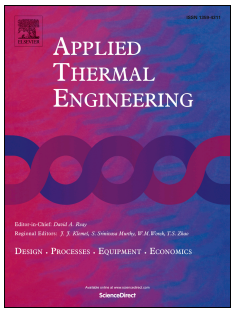

Study on the effect of wellbore heat capacity on steam injection well heat loss

Yong-Le Nian, Wen-Long Cheng, Tong-Tong Li, Chang-Long Wang

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Yong-Le Nian, Wen-Long Cheng*, Tong-Tong Li, Chang-Long Wang

Department of Thermal Science and Energy Engineering, University of Science and Technology of China, Hefei, Anhui, 230027, China

ABSTRACT

The accurate calculation for heat loss from steam to formation in steam injection well is of great importance for enhanced oil recovery (EOR) in the thermal recovery process for heavy oil. In this study, a novel heat loss model with consideration of wellbore heat capacity was set up and the heat loss was simulated by the new model. Finally, this paper focused on the effect of wellbore heat capacity on wellbore heat loss with times, and the steam injection conditions was also regarded to study on the influence of wellbore heat capacity on heat loss. It was found that the wellbore heat capacity had an obvious influence on the wellbore heat loss, especially at early stage of steam injection. Consequently, the new heat loss model could solve the problem of low precision for heat loss calculation at early injection time caused by the conventional model due to ignoring wellbore heat capacity. Furthermore, the heat loss would decrease with the increase of wellbore heat capacity, and the effect of wellbore heat capacity on heat loss became significant with increase of steam injection pressure.

Keywords: Steam injection well; Heat loss; Wellbore heat capacity; Early stage of steam injection

* Corresponding author, Email: wlcheng515@163.com, Tel. /Fax: 086-551-63600305.