

Development of a Steam Distribution Network Simulator for Enhanced Oil Recovery Systems

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Enhanced oil recovery (EOR) by injecting steam into oil wells is widely used to make the oil less viscous, thereby improving its mobility and recovery. Steam is generated by steam generators and supplied to oil wells through steam pipeline network. In order to optimize the effects of EOR, it is necessary to predict steam properties in the pipelines with high accuracy. In this paper, a newly developed steam distribution network simulator for EOR systems is introduced. The features of the simulator are: (1) highly accurate prediction of steam properties including phase change (steam to drain) in complex steam pipeline network by adopting a coupled hydraulic and thermodynamic model and (2) a dedicated interface for operators to edit the steam pipelines easily by referring to a topographic map. The simulation results show that the developed simulator is useful to evaluate and modify existing steam pipelines and to design new steam pipelines.

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