

Development of a dynamic simulator (INFMED) for the MED/VC plant

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ABSTRACT

This paper describes INFMED (Indo-French MED simulator) Software Version 1 that is being developed, under the Indo-French collaboration, to simulate the steady state and the dynamics of a multi-effect distillation mechanical vapour compression (MED-VC) Desalination system. The main objectives of the simulator are to permit a thorough understanding of the steady state design, to study the behaviour of the plant under various transients, to provide training of potential operators, engineers and students, and to allow the further development of new strategies for control as well as for process optimisation. INFMED is basically designed for parallel feed configurations of MED plant coupled to MVC (mechanical vapour compression) but thermal vapour compression models currently under development would also be incorporated later on. The software will be validated with the help of operating data obtained from the Indian installation (50 m³/d MED-VC, currently under construction at BARC, Trombay). INFMED is built in Visual Basic and can be installed on computers running on the Windows 9x/2000/XP operating systems. It offers a very user-friendly graphical user interface for simulating steady and dynamic states and also for viewing the results in both tabulated as well as in a graphical forms. The dynamic state model of an effect was taken from the CEA MED simulator, which is derived from basic mass, energy and momentum conservation equations and supplementary correlation for heat transfer and physical properties. Results of a test case, derived from an operating BARC MED-VC installation, show that the behaviour of multiple variables in the steady state and in the case of postulated transients is indeed very well represented. A complete validation of the simulator results against data from the operating BARC MED-VC installation will be reported later.

Keywords: Desalination simulator; Multi-effect distillation modelling

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