Dynamic simulation of the ENEFIT280 process

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Outotec develops and provides technology solutions for the sustainable use of Earth's natural resources. As the global leader in minerals and metals processing technology, Outotec has developed over decades several breakthrough technologies. The company also offers innovative solutions for the chemical industry, industrial water treatment and the utilization of alternative energy sources. Since 2009 Outotec is working jointly with Eesti Energia in the development of the ENEFIT process for winning oil out of oil shale. This cooperation led to the joint venture Enefit Outotec Technology (EOT). The construction of the first plant of this kind is currently in commissioning in Narva, Estonia. As the solid heat carrier process and its thermal efficiency has been improved significantly, Outotec developed a dynamic model of the ENEFIT process to optimize the control, operation, start-up and shutdown of the process. The model is mainly based on the results from the Aspen steady state simulations, which is itself based on the results from performed bench scale tests in the R&D Centre and simulations in SolidSim. Furthermore the experience of Outotec in the design, layout and operation of main equipment utilized within the ENEFIT process, for example circulating fluidized bed technology, was used for the development of the model. The dynamic simulation is supporting the commissioning of the ENEFIT280 plant in Narva and the already achieved knowledge on starting up the plant with the simulation should decrease the commissioning time. The data collected during commissioning and afterwards during operation of the plant will then be used to further develop the model. There are already further thoughts to extend the dynamic model to an Operator Trainings Simulator to support the personnel.