



基于Matlab的油田注水泵站最优控制系统仿真研究

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A study on simulation of optimal control system of water flooding station in oil field based on Matlab

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摘要 以注水泵站系统效率最大为目标函数,以注水流量、注水泵泵压、注水泵排量等为参数建立约束条件,建立了注水泵站的最优控制系统数学模型,并以现场实时采集数据及生产数据作为边界条件,进行了计算机仿真实验,优化计算出注水泵站各注水泵实时运行参数.最后,通过柴达木盆地西部花土沟和狮子沟注水站的实际生产数据验证了该数学模型的正确性和Matlab仿真模型的实用性.

关键词: 油田注水泵站 最优控制系统 仿真 SIMULINK Matlab

Abstract: In this paper,a mathematic model for the optimal control system of water flooding station in oil field is established,which uses maximizing systematic efficiency of water flooding station as objective function and water flooding flux,pressure and flux of water flooding Pump and so on as the parameters of stipulation,then uses real-time collected data and product data as boundary condition,and the optimal control system is designed.at last,the computer simulation experiment has been completed.By this simulation model,the real-time working parameters of the system in water flooding station can be calculated optimally.The correction of mathematic model and Matlab simulation model is validated with calculating practical data of the Huatugou and the Shizigou water flooding station in the west of Qaidam Basin.

Key words:

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