

Drilling Rig Planning and Scheduling

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Abstract

Drilling rigs are massive structures used to drill oil, gas, or water wells. Drilling rigs are very costly to own/rent and operate; therefore, they must be used efficiently. Scheduling is one of the most critical tasks in reducing oil field costs for oil-producing countries. It is essential in optimizing the schedules of expensive and scarce resources. This will minimize production losses and completion time to drill wells and maximize oil production. This study addresses the planning and scheduling of drilling rigs and workover rigs used to drill new wells and maintain existing wells, respectively. We developed a mixed-integer programming formulation of the rig scheduling problem and implemented it in IBM CPLEX OPL. We validated the model with several computational tests with various test problems. Also, we developed a heuristic-based Decision Support System (DSS) for the problem under consideration, which is implemented in Excel Visual Basic.