

Oil and gas production

Improve your rig scheduling

Vancouver company Actenum has 5 mathematics Phds developing algorithms to optimise scheduling. Saudi Aramco uses it to optimise their rig scheduling, other companies use it for planned maintenance.

The software goes through all the possible assignments of rigs to well locations, to work out which one is the optimum according to different metrics, for example net present value or maximised production.

The software can quickly recalculate the optimum way to deploy the rigs after any operational change—for example, a breakdown, or drilling taking longer than expected—so producers always know what expected rig movements and costs will be, and how to reschedule rigs as conditions change and disruptions occur.

The software takes into consideration the daily rate at which a rig is chartered out (fixed at the time of the charter), and its transportation cost.

"Normally, when you reschedule, you do it based on your past experience and knowledge. But you do it in the dark. You don't really know ahead of time if your decisions are going to be productive or not, or if they will cost a lot of money," says Actenum's marketing manager Owen Plowman. "Our tool lets you assess the value of your decision."

"Saudi Aramco tested the software for 3 months, used it in a major planning exercise, and then they came back and said we're getting some results from it, and they signed up," says Mr Plowman.

Producers can use Actenum's software to make sure that they always have their rigs scheduled in an optimum way, and can also quickly work out the costs of any changes.

"They have to decide, is it worth moving a particular rig?," he says.

"For example, when you are going to send a rig to a particular well, and the rig is not ready when expected, you might have 2 other suitable rigs which are available, but quite far away," he says. "The software will help you determine which one you should bring in, based on the schedule for the rig."

The tool can also enable rigs to be rescheduled after a change to the drilling plan. For example, there might suddenly be a requirement to drill more wells, that wasn't in the schedule before, or wells which had been planned and no longer required. Drillers might want to move certain wells up in the schedule because they are more important, for example injection wells.

Many companies use Microsoft Excel for this kind of work, but Actenum's software can do a lot more than Excel can.

"If management asks how much more production would result from adding a rig, it's very hard to get an answer like that using Excel," Mr Plowman says. "If you use our Rig Activity Scheduler you can answer a question like that in 30 seconds."

Maintenance

Actenum's technology was originally put through its paces scheduling planned maintenance jobs for a Canadian oil sands company.

"If a company has 12 large pieces of equipment made up of 2,000 sub assemblies, including pumps, valves, compressors, pipelines and processing units, the software will automatically produce a preventative maintenance schedule for all that equipment for any given time period," says Mr Plowman.

"If things break down, or you find out that a maintenance crew will be delayed for some reason, the software can revise the schedule quickly and intelligently.

A Saudi Aramco employee heard Actenum giving a conference presentation on maintenance scheduling, and realised the approach could also work for rig scheduling.

Actenum has also been asked to look at using its technology to optimise steam assisted gravity drainage (SAGD) projects in the Alberta oil sands.

Actenum

Actenum was founded in 2003, to commercialise optimization research work started at a university in Vancouver. The company still has close links to the research community.

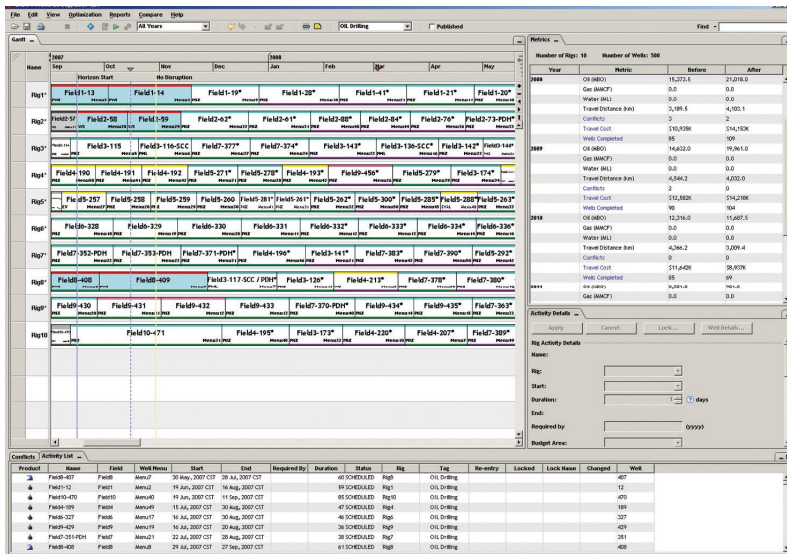
The optimization technology is based on new mathematical techniques; of

the 18 employees, 5 of them have PhDs in a specific area of mathematics, Mr Plowman says.

Actenum will present a joint paper with Saudi Aramco at the ATCE in Anaheim this year, entitled 'Increasing production and reducing rig costs in complex drilling operations.'



30 seconds to work out how much more production you would get from adding another rig - Owen Plowman, Actenum



Actenum's software is used by Saudi Aramco to optimise scheduling for 135 drilling and workover rigs