

Integration of Production Analyst and Microsoft Excel's Solver for Production Forecasts and Optimization

M. C. Arnondin, SPE, Mobil North Sea Ltd.

This paper discusses the approach taken to link OGCI's Production Analyst to IPM models so that production optimisation and forecasting can be carried out to achieve significant economic benefit.

The objective for the model was to predict the maximum oil production while honouring gas compression and water handling constraints.

Prior to linking IPM and PA, the approach was to download the production schedules into a spreadsheet and sort the monthly rates by well on GOR and WC to identify excess of the facility limits at each of them. These wells would then be shut in numerically and removed from the summation, however, as facility limits were relaxed by declining the well rates. The procedure to honour the well's true potential when brought back into the summation then became complicated.

The spreadsheet developed for this system was made up of three parts: timestep, well performance database and solver. These parts are discussed in greater detail below:

1. Timestep

This defines the number of years and months to forecast, the start date of the forecast, platform gas and water constraints and platform efficiency.

2. Well Performance Database

This is used to define the well name, latest well test results, expected ultimate recovery and the performance relationships.

3. Solver

Optimise the oil production for the first timestep only, provides an area for scratch calculations necessary for subsequent timesteps and acts as solver to calculate a solution in which the well multiplier is adjusted to find the optimal oil rate within the water and gas constraints.

Conclusion:

This application added value in several ways:

- Significantly reduces the time required to generate a constrained facility production forecast.
- It is based on a robust and quality controlled database.
- Uses tools which the engineers are already familiar with.
- Meets the specific requirements.
- Contains the built-in flexibility of a spreadsheet.