INTEGRATED PRODUCTION MODELLING (IPM) & “DIGITAL OILFIELD”

INTRODUCTION TO INTEGRATED PRODUCTION MODELS
In the past, reservoir, well and surface facilities were optimised as individual components. Integrated Production Modelling (IPM) dynamically links these three parts of the production system into one interactive model, facilitating the optimization of the entire asset.

IPM links a combination of analytical models:
- Reservoir Material Balance, Decline Analysis or Gridded Simulation Model
- Wellbore Completion Efficiency, Vertical Flow or Artificial Lift Performance
- Process, Facility, and Pipeline Performance and System Constraints

The IPM process begins with an assessment of the project scope, deliverables, and time/resource requirements. Field and reservoir data are used to build and validate the model, or alternatively, simulated data can be utilized to define exploration models. Data uncertainty is tested through sensitivity analysis.

Once an IPM has been constructed and validated, it is ready to be used both as a predictive and as a surveillance tool and can honour a variety of system constraints and contract scenarios. New field development studies can also be accomplished with IPM, based on data available and reasonable assumptions. If appropriate, forecasts for various options can be assessed using a risk-based economic approach.

IPM analysis has resulted in:
- Increased field productivity
- Increased recovery
- Cost savings
- Reduced technical and economic risks

“DIGITAL OILFIELD” AUTOMATION SERVICES
Much of the IPM software is developed with an “open architecture”, thus facilitating customisation of models to third party or proprietary software. RPS provides Customised Software Solutions to integrate existing software and data sources into the active model. This is a major step towards real-time reservoir management (i.e. ability to gather, process and analyse all available field data on the entire system).

These automation services cover a broad range of topics, including:
- Integration of existing IT services with IPM
- Reducing the tedium of daily tasks, such as updating models with new well test data. This encourages model maintenance and long term use.
- Automation of reporting requirements to meet standard corporate requirements
- Enabling rapid data transfer from a multitude of corporate databases into the model.
- Model validation and QA/QC
- Reporting and ranking of optimisation results

The Integrated Modelling approach improves decision-making over the life of the asset. It provides a method of setting strategic direction and deploying technical resources with accurate predictions, coupled with the quantification and impact of uncertainty.

RPS can provide experienced personnel to set up, run, maintain and customise Integrated Production models for all sizes of assets, at any stage of development. This work can be done independently or in close co-operation with the operator’s own staff.

The deliverable is a tool that optimises field-wide performance and facilitates the periodic review of drilling, workover, and facility upgrade opportunities. RPS will develop optimisation recommendations for the operator; and can provide engineering assistance in implementing these recommendations.

If you require assistance with Integrated Production Modelling or Automation services please contact:

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