

WHAT IS A PMT TOOL?

An online production monitoring tool customized for a specific production system (customized software package).

Allows user to optimize well performance through available artificial lift and back pressure reduction equipment at WHPs, e.g. WUU, gas lift and remote compressors.

Is based on well nodal analysis (Prosper) and platform modeling (GAP).

Compiles relevant well optimization data into one database, data from

- Production test data
- Pressure Transient Analysis data
- Reservoir databases
- Well and Drilling databases such as WellView
- Pressure survey databases, PVT databases, sand and perforation reports, well intervention events

BUSINESS DRIVERS

Consistent workflow and well validation sheet triggers
Data clean up in particular on well performance: better data quality improves decision quality
System optimization with less trial and error
Saves people time
Well optimization opportunities highlighted
Wells are flowing into the right system
Integration of people, processes, technology and information to drive high quality decisions

PRODUCTION MONITORING TOOLS**OBJECTIVES**

Representative well and network models should be used as reference on how we manage production. They are required to understand hydraulic effects simultaneously in each node affecting production. The model becomes one of the decision making tools to optimize production. It also assists in setting up the forecast on short-term field performance to support investment decisions for field development.

DESCRIPTION

Production monitoring tools provide the ability to quickly update and optimise production of the wells in a production network model. Key issues PMTs cover:

- Semi real time data is evaluated fast and provides the basis of optimisation.
- Data is validated with hydraulic calculations.
- The new data is used to update well settings and generate a new production optimisation scenario.
- The incremental production is measured and based on discrepancies, well properties are updated.

Typically engineers used Prosper and GAP to optimize a production system. The PMT automates the match of the models. The result is more certainty to the predicted well performance such that detailed and reliable production optimization can be completed.

WHAT IS UNIQUE?

- Automated workflows for optimisation
- Training material is provided
- Easy transfer of data
- Simple optimisation workflows using the PETEX tools
- Extensive experience in production optimisation & debottlenecking

TASKS OF THE PMT

Tasks which are typically performed by the production monitoring system are as follows:

- Tie in production data reported offshore from other databases into the production monitoring system to access data easily.
- Automatically validate production test data with engineering calculations.
- Historical data can be re-evaluated for validity.
- Customise automated engineering workflows and a production monitoring system based on the operator's workflow for production optimisation.
- Automatically update a field simulator such as GAP to reallocate gas lift or optimise an artificial lift system.
- Important may be that unlimited licenses are available.

WHAT TO EXPECT FROM A PMT

- Continuously and easily evaluate key decision parameters: Drawdown, Productivity Index, Pres
- Provides optimum production scenarios of the network system
- Identify debottlenecking opportunities
- Tools to support decisions for field developments
- Drive short-term forecasts (i.e. potentials)

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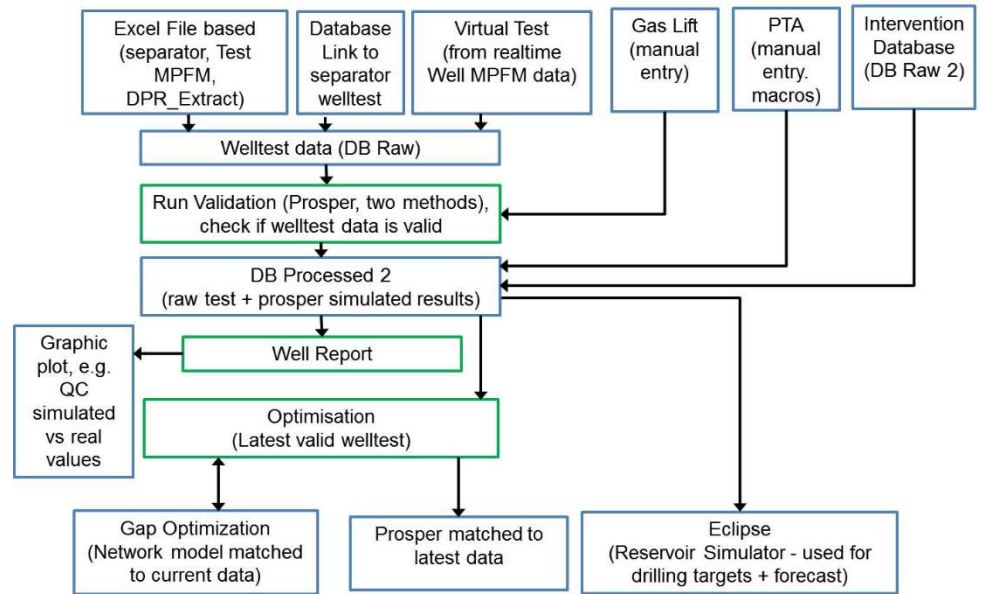
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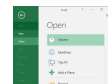
Web : www.sapella.eu

PMT DATABASE STRUCTURES

A typical database layout for a PMT Tool is shown in the diagram. Workflows are designed to validate and correct production test data. Automated result generation and quality checked processing provides a better



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Open the platform specific Excel PMT workbook



In PMT select the platform



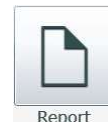
PMT connects to the PMT workbook and opens the previous data base



Update the database from file, data base or calculation



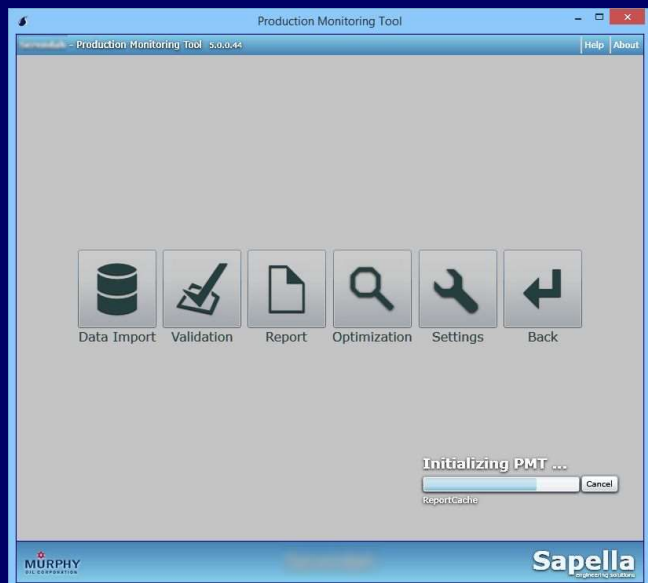
Validate



Report



Optimization



Production Monitoring Tool

Workbook

Matching

Display

Columns

Sheet

Help

Import

Data row - 1 / 8 Records

Close

Platform	Well	Well Type	Artificial Lift Method	Test Start	Test End	Test Duration	Choke Setting (1/64th)	THP (psia)	WHT (deg C)	Test Water Rate (stb/d)	Test Oil Rate (stb/d)	Test Gas Rate (MMscf/d)	Test WCT (°F)	Test GOR (stb/scf)	Test RHP (psia)	Gas Lift Rate (MMscf/d)	FLR (ft)
Serendah	OP	NF		7/2/2013		6	0.0	718.0	57.0	14.7	0.0	2,573.0	0.0	0.0	0.0	0.0	14.7
Serendah	OP	NF		7/2/2013		6	40.0	987.7	64.3	14.7	0.0	2,907.5	2.1	0.0	1,329.3	0.0	139
Serendah	OP	NF		7/4/2013		6	40.0	987.7	64.3	14.7	0.0	2,907.5	1.0	0.0	989.9	0.0	162
Serendah	OP	NF		7/5/2013		6	36.0	708.7	62.7	14.7	0.0	2,879.9	1.8	0.0	614.3	0.0	172
Serendah	OP	NF		7/7/2013		6	40.0	723.7	61.9	14.7	0.0	2,350.0	1.6	0.0	617.3	0.0	176
Serendah	OP	NF		7/19/2013		6	40.0	14.7	62.7	14.7	0.0	1,424.0	2.6	0.0	1,388.0	0.0	174
Serendah	OP	NF		7/19/2013		6	40.0	987.7	62.7	14.7	0.0	1,424.0	2.6	0.0	1,376.7	0.0	180
Serendah	OP	NF		7/7/2013		6	0.0	14.7	62.7	14.7	0.0	2,495.0	0.0	0.0	0.0	0.0	14
Serendah	OP	NF		7/7/2013		6	40.0	723.7	61.9	14.7	0.0	2,495.0	1.6	0.0	427.3	0.0	154
Serendah	OP	NF		7/7/2013		6	0.0	14.7	62.7	14.7	0.0	1,543.0	0.0	0.0	0.0	0.0	14
Serendah	OP	NF		7/8/2013		6	0.0	14.7	62.7	14.7	0.0	2,495.0	0.0	0.0	0.0	0.0	14
Serendah	OP	NF		7/8/2013		6	40.0	970.7	62.7	14.7	0.0	1,604.0	2.6	0.0	1,621.6	1,476.0	169
Serendah	OP	NF		7/8/2013		6	40.0	987.7	62.7	14.7	0.0	1,543.0	2.6	0.0	1,388.0	1,409.0	166
Serendah	OP	NF		7/18/2013		6	40.0	626.7	62.7	14.7	0.0	1,376.0	2.1	0.0	1,321.0	1,240.0	159
Serendah	OP	NF		7/19/2013		6	36.0	708.7	62.7	14.7	0.0	2,677.7	1.8	0.0	397.2	1,602.0	159
Serendah	OP	NF		7/20/2013		6	40.0	724.7	62.7	14.7	0.0	2,350.0	1.6	0.0	629.1	1,621.0	157
Serendah	OP	NF		7/20/2013		6	40.0	708.7	62.7	14.7	0.0	1,543.0	2.6	0.0	1,604.0	1,520.0	157
Serendah	OP	NF		8/6/2013		6	40.0	720.1	62.7	14.7	0.0	2,315.0	1.8	0.0	700.3	1,621.0	146
Serendah	OP	NF		8/6/2013		6	30.0	656.3	62.7	14.7	0.0	1,342.0	1.4	0.0	1,099.0	1,496.0	145
Serendah	OP	NF		8/10/2013		6	36.0	725.1	62.7	14.7	0.0	1,496.0	1.8	0.0	987.5	1,621.0	143
Serendah	OP	NF		8/10/2013		6	30.0	716.1	62.7	14.7	0.0	2,315.0	1.7	0.0	675.6	1,620.0	146
Serendah	OP	NF		8/11/2013		6	36.0	498.6	62.7	14.7	0.0	1,277.6	1.3	0.0	2,622.5	1,604.0	145
Serendah	OP	NF		8/11/2013		6	30.0	656.6	62.7	14.7	0.0	1,355.0	1.3	0.0	1,051.9	1,496.0	146
Serendah	OP	NF		8/12/2013		6	36.0	722.1	62.7	14.7	0.0	1,720.0	1.5	0.0	820.0	1,621.0	149
Serendah	OP	NF		8/12/2013		6	36.0	720.4	62.7	14.7	0.0	1,721.0	1.4	0.0	820.1	1,621.0	150

Clear

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MURPHY

Serendah

Sapella