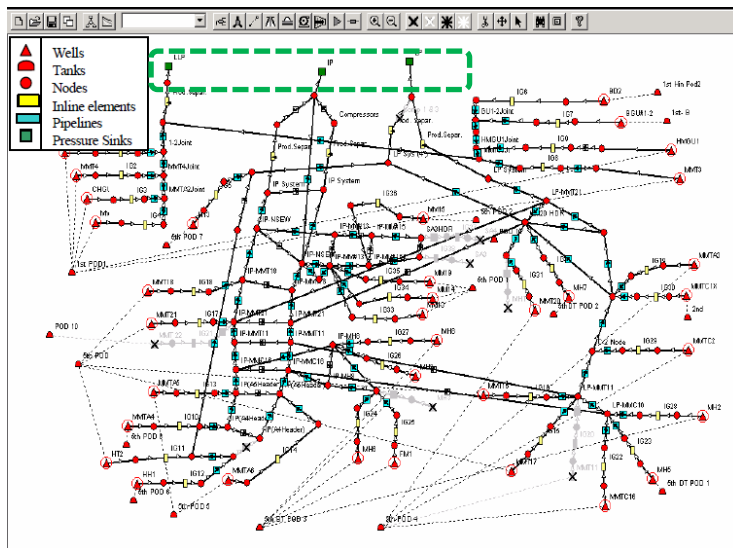


SPE 90519 Case History of Using an Integrated Asset Model for Depletion Planning of a Tight Gas Reservoir, Northeast Thompsonville Field, Jim Hogg and Webb Counties, Texas

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A tight gas development study was carried out to determine how to lower the field abandonment pressure, increase rates and reserves, improve profitability and find the best way to manage the natural decline of the gas field.

This is a high temperature reservoir so the presence of the water vapour and its impact on pressure drop in the pipelines and wellbores was captured as were the compressor effects on the production system. This was achieved with the use of IPM (MBAL, GAP and PROSPER), ensuring that the reservoirs and their transient behaviour could be history matched and linked to a full field network model. The surface network itself incorporated 3 pressure systems as highlighted in green below:



LLP (low-low pressure) was set to 25psig to apply to the wells drawing from the highest permeability or thickness. LP was set to 100psig and IP at 450psig.

The surface pipeline also feeds into 5 reciprocating compressors.

This fully integrated model could then be used to run forecasts for various operating scenarios.

Benefits:

The primary benefits were the evaluation of a complex surface and subsurface system via scenario analyses. This allowed the understanding of the impacts of installing additional compression capacity and modification of the surface network to be achieved while verifying that the field life could indeed be mitigated and extended.

The holistic understanding of all of the systems in play also complemented the discussions between operating personnel.

Conclusions:

- Production gains achieved by increasing compression horsepower were largely due to the downtime reduction of the liquid loaded wells.
- The most economic compression upgrade resulted in a rate and recovery increase of 10%.
- IPM was very helpful the compressor utilisation planning.