

ADP INTEGRATED NETWORK MODELLING STUDY

CASE STUDY

PETRONAS Carigali - Block PM 313 Gas Cluster Fields
Offshore Peninsula Malaysia

AWT DISCIPLINES

- Reservoir Engineering
- Production Technology
- Artificial Lift Design
- Completions Engineering

PROJECT BACKGROUND

Fourteen gas fields operated by PETRONAS Carigali Sdn Bhd (PCSB) were identified and clustered into groups largely based upon regional proximity and CO₂ concentration. One of the most critical elements of the study was CO₂ management. The CO₂ levels ranged from 6% to 40%. AWT developed a fully integrated gas planning model linking reservoirs, wells and surface facilities for this study, allowing the investigation of the impact of CO₂ production profiles, reservoir pressure behaviour, volumes of CO₂, well deliverability, blending of CO₂, timing of wells and field scheduling. The gas planning tool also enabled optimisation of the entire production system along with effective management of CO₂ production. The results from this tool could then be used to formulate a robust area development plan (ADP) in order to commercialise the development.

Location:

Block PM 313 Gas Cluster Fields

No. of Fields:

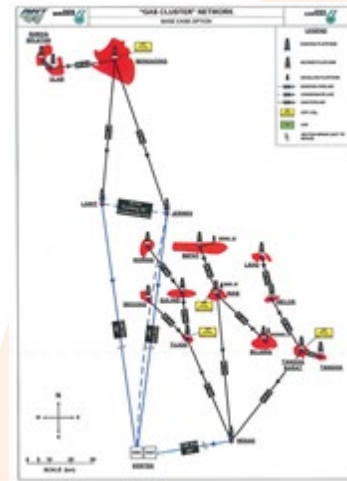
Fourteen gas fields

Fluid Properties:

Average CO₂ levels ranged from 6% to 40%

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AWT WORKSCOPE

The primary objective of the study was to develop a complete network model of all the 14 fields, wells, pipelines, compressor inlet/outlet and ex-platform/landing pressures, varying gas production rates and CO₂ composition for the PM-313 Gas Cluster in order to:

- Determine the net sales gas volumes that could be supplied to address the PGU demand
- Model the gas and condensate profiles at selected production systems
- Address the impact of the CO₂s in the gas profile and the options for blending between high and low CO₂ fields to meet the GPP 8% specification.

The scope of work included:

- Integrated technical workshop
- Reservoir review & material balance modelling
- Well deliverability & production profile review
- Uncertainties, opportunities and risks framing
- Network planning and optimization modelling

AWT ADDED VALUE

- A fully integrated network model was developed that could be used as a gas planning tool for the PM-313 gas cluster.
- The model results helped the client with the planning of gas supply, scheduling field developments, blending of high CO₂ gas compositions, security of supply concerns, well, field and pipeline sizing/requirements.
- AWT reduced the CAPEX base case by USD300 million, by reducing the total facilities requirements and total number of wells to deliver the same production targets.
- The project was scheduled over an 8 month period and was completed on schedule, on budget and with all PCSB reviews completed.