

## **3D seismic field evaluation — integrated application approach**

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In late 1998 Petronas Carigali Sdn. Bhd. (PCSB) embarked on an Integrated Workflow project as part of its continuous technology improvement benchmarking. The Integrated Workflow concept consists of a series of linked domains or components incorporating People, Processes, Data, Software and Infrastructure. This Integrated Workflow was approved as a new benchmark for PCSBs in early 1999 and was used to carry out a technical evaluation of a gas field with 3D seismic data.

As part of the Integrated Workflow, both the business and technical objectives and deliverables were finalised with supervisors and management before the start of project.

This project starts with the loading and quality control of a trusted data set involving 320 square kilometers of 3D seismic data, stacking velocity data and three well data. Proper work plan and technical process were determined upfront based on the best practice that has already been established. Six software packages were utilised: Data management software, Seismic interpretation software, mapping software, geological interpretation software, Synthetic seismogram software and time-depth conversion software. The Integrated Workflow will move data from one software to another and incorporate all the interpreted results from different software into a dynamic 'Shared earth model'. The Shared earth model will be demonstrated by an example of generating a geological cross-section which integrates lithologies interpretation from wireline logs and geological tops using the main geological interpretation software, 3D seismic data with its interpreted seismic horizons and faults using seismic interpretation software, time to depth conversion calibrated by synthetic seismogram from synthetic seismogram software was performed using time-depth conversion software. The trusted database is managed using data management software that links all the application together.

Large quantities of output were generated which include three synthetic seismograms, eight time structure maps, twenty-one depth structure maps, thirty-six amplitude attribute maps and two geological cross-sections.

This case study highlights a technical evaluation of a gas field with 3D seismic data using an Integrated Workflow approach to ensure the quality and quantity of the results. Furthermore, the cycle time that has been substantially reduced in completing the technical project.

The main factors of the success in implementing the technical project are 1) efficient Integrated Workflow which utilises all the available software, 2) emphasis on the quality control procedure and 3) just-in-time classroom training and mentoring.