Please fill in the name of the event you are preparing this manuscript for.	International Petroleum Technology Conference 2021
Please fill in your 5-digit IPTC manuscript number.	21IPTC-P-2017-IPTC IPTC-21459-Abstract
Please fill in your manuscript title.	Co-processing - Where Classic Meets Modern: A Case Study From Offshore Peninsular Malaysia

Please fill in your author name(s) and company affiliation.

Given Name	Surname	Company
M Nasrul	M Isa	PETRONAS Carigali Sdn Bhd
Wai Hoong	Tang	PETRONAS Carigali Sdn Bhd
Chui Huah	Lim	Vestigo Petroleum Sdn Bhd
Duen Woen	Ang	Vestigo Petroleum Sdn Bhd

Abstract

In recent years, there are a lot of technologies available in seismic processing andimaging. Such technologies can be used to unlock the remaining potential of the vintage seismic dataavailable in oil company. The geophysicists shall acknowledge that there might be possibilities ofchallenges raised when applying these technologies on vintage data. The objectives of thereprocessing work are to reduce the structural uncertainty and subsurface imaging, broader the seismicbandwidth, and get reliable AVO response. There are 2 seismic vintages available, the 2010 3D and the1989 3D. Both were co-processed together due to their closed-by location and also to relate thesubsurface within that area.

The 1989 3D was acquired in N-S direction with a single source dual-streamer configuration, shooting at 26.66m interval with 2546m streamer length at 13.33m receiverinterval. Meanwhile, the modern 2010 3D, it was acquired in NW-SE direction with a dual-source 12streamers configuration, shooting at 18.75m flip-flop with 6000m streamer length at 12.5m receiverinterval. Co-processing of 2010 3D with 1989 3D seismic provide huge advantage in uplift the quality of 19893D beyond its current limit while enhancing the 2010 3D over it's current quality. Both 1989 and 20103D seismic data has been pushed beyond their current limit through applications of 3D deghosting, 3Ddemultiple, 3D interbed multiple elimination, 5D interpolation and velocity model building processwhere the 3D FWI and Q-tomography were included as well. Through the co-processing synergy, weare able to make the velocity model of the 1989 3D comparable with the 2010 3D despite theconventional acquisition parameters (limited offset and low frequency data due to instrument limit).

Both 2010 3D and 1989 3D were migrated using Q-KirchhoffAPSDM algorithm with the migration velocity coming from 3D FWI and reflection tomography. Thevelocity is able to capture the near surface shallow gas bodies and channels within both survey areasdespite the limitations mentioned above especially for the 1989 3D survey (Figure 1). The imagingresults have improved significantly in which, improved reflectors continuity, sharp faults imaging andreduced mis-tie between seismic and well-markers. Given the limitations of 1989 3D due to itshistorical seismic acquisition parameters, the co-processing approach successfully elevate the quality ofboth seismic data to different level.

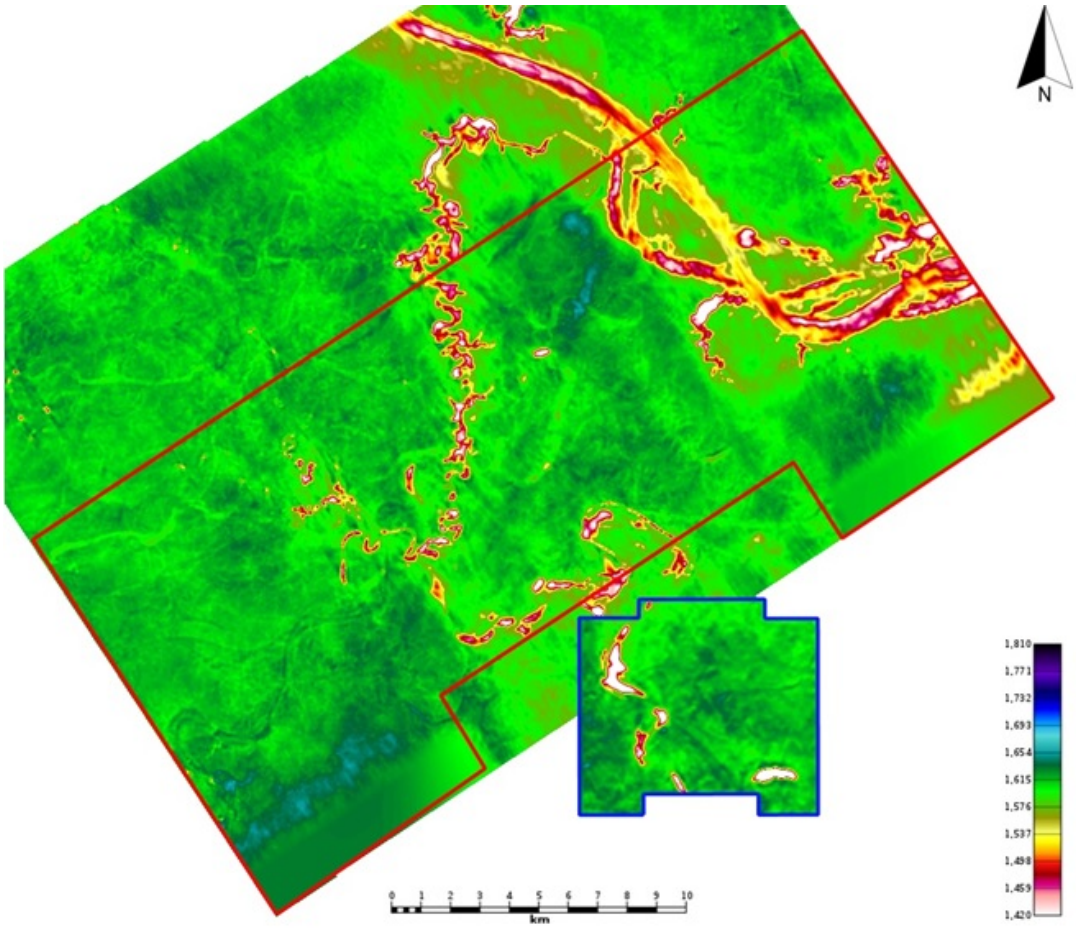

Figure 1. 3D FWI velocity model at depth slice of 110m. The 2010 3D is marked by red polygon and the 1989 3D is marked by the blue polygon.

Based on this co-processing case study, the available vintage seismicdata can be pushed beyond its current limit by adopting state-of-the-art seismic processing andimaging technologies and can be used for new interpretation and optimise well placement work. Withacknowledgement of few challenges mentioned, this will gives better confident when deal withreprocessing of the very old seismic data.