



CREWES NEWS

The Consortium for Research in Elastic Wave Exploration Seismology

CREWES at ERCH 4D-4C Consortium Sponsors' Forum

Some results from CREWES' involvement with the Teal South Project are to be presented by Rob Stewart and Brian Hoffe at the Energy Research Clearing House (ERCH) 4D-4C Consortium Sponsors' Forum being held in Houston on October 29, 1999. Rob's presentation concerns "Preliminary processing results of the Teal South Phase II 4D-4C OBC data", and focusses on the preliminary processing results of the recently acquired Phase II data produced by Ph.D. student, Carlos Rodriguez. Brian discusses "Preliminary OBC designs for Teal South Phase III", and presents some possible designs for the proposed Teal South Phase III acquisition.

The ERCH 4D-4C Consortium was organized to evaluate multi-component, time-lapse ocean bottom recording and to study seismic acquisition repeatability in Texaco's Teal South Project located in Eugene Block 354 in the Gulf of Mexico. Operating companies have been looking at the developing technology of repeated 3D seismic surveys (usually referred to as 4D or time-lapse seismic) to monitor their fields for better reservoir management. Studies have also shown that including the shear wave component gives a more comprehensive reservoir description. To date, two 3D-4C surveys (Phases I & II) have been acquired at Teal South.

CREWES Discusses OBC Research Project

Brian Hoffe recently represented CREWES at a preliminary meeting with representatives from the Memorial University Seismic Imaging Consortium (MUSIC) and industry to discuss the possibility of an ocean-bottom cable (OBC) project to improve the present state of OBC technology.

As currently proposed, the project would encompass a broad range of investigations from theory, laboratory testing, in-situ field testing, and hopefully conclude with a full OBC survey. Variables such as hydrodynamic forcing (i.e. currents & tides), bottom coupling, mass, effect of cable connections, geophone orientation, gimbaling and solid-state versus electro-mechanical elements, would all be subject to experiment.

Through involvement with this project, CREWES gains further expertise in OBC survey design and implementation. The industry-ready results would be made available to Sponsors.

We will keep you informed of progress.

CREWES Welcomes New Sponsor - Norsk Hydro ASA

CREWES is delighted to welcome our newest sponsor. Norsk Hydro is a large diversified company based in Norway. We will be working with the Oil and Gas division. Sponsor Representative is Jan Petter Fjellanger, based in Bergen, Norway. We look forward to working with Norsk Hydro.

CREWES at the SEG

As mentioned in previous newsletters, CREWES will be presenting at the SEG again this year. Our booth is located in the Consortia area at location B1, where we look forward to meeting you. A list of CREWES presentations to be given at the conference has been published in the August issue of CREWES NEWS, and is available on the CREWES website (www.crewes.ucalgary.ca, click the *Abstracts for conferences* link).

Room Availability Update for Kananaskis

Rooms are still available at the Delta Lodge at Kananaskis for the nights of December 1 and 2. However, the Lodge and other hotels in Kananaskis are fully booked for the night of December 3. Call the Lodge directly at 403-591-7711, or call 1-800-268-1133 to request your reservation for December 1 and 2.

If you require accommodation for the night of December 3, you can make arrangements to stay in Calgary, Banff, or Canmore.

1999 Sponsors Meeting Outline Agenda

The outline agenda for this year's Sponsors Meeting is noted below, and is also available on our website, www.crewes.ucalgary.ca, at the *Sponsors Meeting Information* link.

Wednesday, December 1

7:00-9:00 PM: Registration, Reception

Thursday, December 2

8:00 AM: Registration (continued)

8:30 AM-4:30 PM: Technical Session

4:30 PM: Reception

Friday, December 3

8:30 AM-4:00 PM: Technical Session

4:00-5:00 PM: Closing Reception

AVO Analysis by Simultaneous P-P and P-S Weighted Stacking - Jeff Larsen

Congratulations to Jeff Larsen, who graduated this month with an M.Sc. Jeff has now joined Husky Oil and we wish him the best of luck with his career.

Jeff's M.Sc. thesis abstract is presented below and copies of the complete thesis will be given to Sponsors at the Sponsors Meeting.

This thesis presents a method to simultaneously invert P-P and P-S pre-stack seismic data to derive estimates of compressional and shear impedance values. These estimates of compressional and shear impedance can thus be used to correlate anomalous lithology and pore-fluid content changes in the subsurface. The simultaneous inversion method utilizes a model-based, weighted stacking approach similar to established P-P methods. The primary difference with this method is the inclusion of P-S seismic data and thus a different set of model-based weights. These weighted stacking methods are compared using synthetic data, as well as data from a three-component, three-dimensional (3C-3D) survey from the Blackfoot field in Alberta, Canada.

The simultaneous inversion method has been shown to give similar results to standard P-P weighted stacking methods using synthetic noise-free data. Further results show the simultaneous inversion method performs significantly better in areas of high noise or weak P-P reflectivity than comparable methods using P-P seismic data only.

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