

CCOP-DANIDA
Institutional Capacity Building Project ICB-CCOP1
Training and Expert Visit
5-8 March 2007, Ho Chi Minh / Phu Quoc, Vietnam
Report on proceedings and discussions
at the Training and Expert Visit

Date and Venue:

The training course was held in Ho Chi Minh / Phu Quoc, Vietnam from 5th to 8th March 2007 at Vietnam Petroleum Institute (VPI), Ho Chi Minh City, Vietnam and Kim Hoa Resort Hotel, Phu Quoc Island.

Vietnam Petroleum Institute (VPI)
Block G1, Thanh Da hotel, Binh Thanh District
Ho Chi Minh City, Vietnam

Kim Hoa Resort Hotel
Address: Block 1 Duong Dong Village, Kien Giang Province, Phu Quoc Island, Vietnam
Tel: (84-77) 847 039
Fax: (84-77) 848 261
Website: <http://www.vietnamhotels.biz/kimhoa/index.html>
Local Organizer: Vietnam Petroleum Institute (VPI)

Participants:

Thirty-seven (37) geoscientists from eight (8) CCOP Member Countries and ASCOPE Members: Cambodia, China, Indonesia, Korea, Malaysia, The Philippines, Thailand and Vietnam attended the training course and expert visit.

The represented agencies/institutes were:

- ❖ Cambodian National Petroleum Authority (CNPA), Cambodia
- ❖ Qingdao Institute of Marine Geology (CGS, Qingdao), China
- ❖ Guangzhou Marine Geological Survey (CGS, Guangzhou), China
- ❖ China National Offshore Oil Corporation (CNOOC), China
- ❖ Research and Development Center for Oil and Gas Technology “LEMIGAS”, Indonesia
- ❖ Pertamina, Indonesia
- ❖ Korea Institute of Geoscience and Mineral Resources (KIGAM), Korea
- ❖ Petronas, Malaysia
- ❖ Department of Energy (DOE), Philippines
- ❖ Department of Mineral Fuels (DMF), Thailand
- ❖ Vietnam Petroleum Institute (VPI), Vietnam

- ❖ PetroVietnam, Vietnam
- ❖ PetroVietnam Exploration and Production (PVEP), Vietnam
- ❖ PetroVietnam Investment and Development Company (PIDC), Vietnam
- ❖ Asean Council On Petroleum (ASCOPE)
- ❖ PTT Exploration and Production Plc., Thailand
- ❖ Geological Survey of Denmark & Greenland (GEUS), Denmark
- ❖ CCOP TS

Detailed list of participants is attached as Annex 1.

Program:

The detailed program of the training and expert visit is provided as Annex 2.

Background and Purpose of the Training and Expert Visit:

The title of the training and expert visit is “Onshore-offshore correlation: Utilisation of data from outcrop geology, well logs, core logs and core measurements from core holes for evaluation of offshore stratigraphy and reservoir architecture and property”.

The interpretation and evaluation of subsurface geology may, in many cases, be enhanced by the use of outcrop data. Data from outcrops adjacent to deep basins may often be collected through relatively inexpensive activities compared to conventional seismic surveys and deep wells. The utilisation of such data may thus be a valuable contribution to a regional conventional data set. The aim of this seminar is thus to exemplify through case examples from Vietnam, the North Sea area and the San Juan Basin in USA how geological models based on detailed clastic sedimentological and sequence stratigraphic analyses can be used in the interpretation of deeply buried, inaccessible sections. Each case will include an introduction, exercises, and discussions of solutions and final presentations by the course instructors with main emphasis on the sedimentology of reservoir sandstones and the use of the models for subsurface interpretations.

The course is designed to be of relevance to a spectrum of geoscientists involved in exploration and production of hydrocarbons with limited experiences on clastic sedimentology, clastic sequence stratigraphy and outcrop geology, and who want to enhance their understanding within these topics. The course is thus designed toward seismic interpreters, reservoir engineers and geochemists. Two senior instructors, Dr Lars Henrik Nielsen and Dr. Peter Johannessen from GEUS were pleased to be invited to give the lectures for this training course.

The course contains a number of case examples with exercises:

1. A ½ day hands-on-cores seminar at Vietnam Petroleum Institute in HCMC (Lower Cretaceous sandstones of the Phu Quoc Fm drilled in the ENRECA-2 well).
2. Introduction to sedimentological and sequence stratigraphic principles with emphasis on shoreface and fluvial sandstones.
3. Log correlation exercises based on log examples from the Danish North Sea and USA

4. Case story from the Cretaceous Western Interior, USA; identification of fluvial and shallow marine reservoir sandstones. Log correlation and construction of maps.
5. Brief introduction to the geology of Phu Quoc Island and field trip to selected outcrops of the Cretaceous Phu Quoc Formation.
6. Presentation by the participants of the results of the core logging exercise and fieldwork, discussion of depositional environments and reservoir potential.
7. Fluvial reservoir geometry.
8. Case story from the Miocene Song Ba Rift adjacent to the offshore Phu Khanh Basin, central Vietnam; comparison to seismic examples of rift-lake sequences, discussion of reservoir and source rocks.
9. Case stories from the Upper Jurassic in the North Sea; reservoir geometry and comparison with Holocene barrier island systems.
10. Case study of Holocene spit system sands: a new potential analogue to shallow marine sandstone reservoirs.
11. Example of an assessment of the hydrocarbon potential of an un-drilled subbasin within the Danish North Sea using regional subsurface and outcrop data.

Proceedings of the Training Course and Expert Visit:

The activity was held respectively in Ho Chi Minh city on 5 March, 2007 and on Phu Quoc Island on 6-8 March, 2007. On the first day of the activity, Mr. Nguyen Van Hoi, director of VPI branch in Ho Chi Minh city made a welcome address to all participants from CCOP Member Countries to the VPI branch office building in Ho Chi Minh city. Then, the two distinguished speakers from GEUS made the instructions alternatively. In the afternoon, all the participants had a chance to visit VPI laboratory, to observe and do hands-on-cores exercises with the Lower Cretaceous sandstones of the Phu Quoc Formation cores from the ENRECA-2 well drilled within the Danish-Vietnam bilateral ENRECA project.

In the following days, the activity venue was moved to Phu Quoc Island. On Phu Quoc Island, the participants had a field trip around the island and discussions on geology of the island. Some case examples from Vietnam, the North Sea area and the San Juan Basin in USA were presented with exercises, and discussions of solutions and final presentations by the course instructors with main emphasis on the sedimentology of reservoir sandstones and the use of the models for subsurface interpretations.

During the training course, Dr. In-Gul Hwang, principal researcher from Korea Institute of Geoscience and Mineral Resources (KIGAM), voluntarily made a presentation based on his research achievements in the western part of the United States to share his knowledge with other participants.

At the end of the training, Mr. Houy Vutha, Petroleum Geologist from Cambodian National Petroleum Authority (CNPA) introduced the petroleum geology in Cambodia to share his knowledge to all participants.

After the training, the group of Cambodian, Danish and Vietnam geoscientists continued to the joint CAMBODIA-VIETNAM-DANIDA-CCOP geological field study in the framework of ENRECA project, with Final Workshop, held in Phnom Penh hotel, Phnom Penh, Cambodia, on 15 March 2007. This again shows the impact of the regional project as the strong foundation for facilitating the bilateral cooperation between countries involved.

The evaluation form from all participants is attached as Annex 4.



INSTITUTIONAL CAPACITY BUILDING IN CCOP COUNTRIES,
PHASE 1 (ICB-CCOP1)



The ICB-CCOP1, Training and Expert Visit Participants

Ho Chi Minh / Phu Quoc



The opening ceremony of the training and expert visit was held at VPI Ho Chi Minh Branch 5th March, 2007.



Introduction on core observation



Discussions during the core observation



Participants had a field trip to the ENRECA-2 well site



Field study in Phu Quoc Island



Instruction and exercise



Certification



Farewell
dinner



Culture
event to
celebrate the
success of
the activity
and enhance
the
friendship
between all
participants



Annex 1

**CCOP-DANIDA Institutional Capacity Building Project ICB-CCOP1
Training and Expert Visit
5-8 March 2007, Ho Chi Minh / Phu Quoc, Vietnam**



DISTINGUISHED GUESTS







NAME	POSITION / ADDRESS
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Annex 2

CCOP-DANIDA Institutional Capacity Building Project ICB-CCOP1 *Training and Expert Visit* 5-8 March 2007, Ho Chi Minh, Vietnam

PROGRAM

Monday 5 Mar	<p>8.30: Welcome: VPI/ CCOP</p> <p>8.45: Introduction to course; scopes, outline, content and time frame: LHN</p> <p>9.15: Introduction to sedimentary structures and clastic depositional environ.: PJO</p> <p>10.45: Tea break</p> <p>11.00: Introduction to sedimentological logging exercise: LHN</p> <p>11.30: Lunch</p> <p>12.45: Core exercise 1, in groups of 2-3 geoscientists</p> <p>13.45: Presentation of core log from 1 or 2 groups</p> <p>14.00: Core exercise 2</p> <p>15.30: Presentation of core log; Enreca-2 well logs; sst petrography: LHN</p>
Tuesday 6 Mar	<p>Travelling to Phu Quoc Island</p> <p>12.30: Lunch</p> <p>14.00: Recap: LHN</p> <p>14.15: Fluvial reservoir models: PJO</p> <p>15.00: Tea break.</p> <p>15.15: Introduction to clastic sequence stratigraphy: LHN</p> <p>15.45: Exercise 1: PJO</p> <p>16.15: Exercise 2: PJO</p> <p>16.30: “<i>Sharp Based Shoreface Deposit</i>”, Dr. In-Gul Hwang, KIGAM</p> <p>17.00: End of day</p>
Wednesday 7 Mar	<p>8.30: Exercise 3: PJO</p> <p>9.30: Exercise 4 San Juan Basin, Lower Cretaceous, USA: PJO</p> <p>11.00: Presentation of San Juan Basin case: PJO</p> <p>11.45: Introduction to field trip: LHN</p> <p>12.30: Lunch</p> <p>14.00: Departure for fieldtrip.</p> <p>18.30: Return to hotel</p>
Thursday 8 Mar	<p>8.30: Recap from yesterday: LHN</p> <p>8.45: Song Ba Rift case: LHN</p> <p>9.15: Barrier islands: PJO</p> <p>9.30: Barrier island exercise: PJO</p> <p>10.00: Tea break</p> <p>10.15: Skagen case: LHN</p> <p>11.00: Upper Jurassic, Danish North Sea Case; Intro, exercise: PJO</p> <p>12.00: Lunch</p> <p>13.00: Cont. exercise</p> <p>13.30: Presentation of Upper Jurassic North Sea case: PJO</p> <p>14.15: Farsund Basin case: LHN</p> <p>15.00: Tea break</p> <p>15.15: Wrap up: PJO / LHN</p> <p>15.45: “<i>The Petroleum Geology and Hydrocarbon Potential of Offshore Cambodia</i>”, Mr. Huoy Vutha, CNPA</p> <p>15.45: Evaluation and Close of seminar: CCOP</p> <p>18.30: Farewell dinner</p>
Friday 9 Mar	<p>Check-out and departure from Vietnam</p>

Annex 3 Invited Speakers' Curriculum Vitae

Geological Survey of Denmark and Greenland: Dr. Peter N. Johannessen

Dr. Peter N. Johannessen, Senior Researcher at the Geological Survey of Denmark and Greenland (GEUS) has worked more than 20 years with clastic sedimentology and sequence stratigraphy within the fields of hydrocarbon exploration, geological storage of CO₂ and modern clastic environments in Denmark, Norway, England and USA. He has conducted numerous research projects for the industry and energy authorities in Denmark and for the European Union. He has been external teacher at the Technical University of Denmark and the University of Copenhagen. He has been the president for the Geological Society of Denmark for four years and is still member of the board. Peter N. Johannessen holds a M.Sc. and Ph.D. in geology from the University of Copenhagen, Denmark.

Geological Survey of Denmark and Greenland: Dr. Lars Henrik Nielsen

Dr. Lars Henrik Nielsen, Senior Researcher and Deputy Head of Department of Stratigraphy at the Geological Survey of Denmark and Greenland has worked more than 20 years with clastic sedimentology and sequence stratigraphy within the fields of hydrocarbon exploration and modern clastic environments in Denmark, Vietnam and USA. He has conducted numerous research projects for the industry and the energy authorities in Denmark and Vietnam, and is currently involved in research projects in Vietnam, where he supervises a number of Vietnamese and Danish Ph.D. and M.Sc. students in various topics related to assessment of the hydrocarbon potential of Vietnamese basins. Lars Henrik Nielsen hold a M.Sc. and Ph.D. in geology from the University of Copenhagen, Denmark.

Cambodian National Petroleum Authority (CNPA): Mr. Houy Vutha

Mr. Huoy Vutha is a Petroleum Geologist at the Cambodian National Petroleum Authority (CNPA). He obtained his Master Degree in Petroleum Geoscience from Brunei Darussalam in 2002. From 1992-1994, he worked at the Geology Section of the Department of Geology and Mines doing geological survey and mapping. For the next five more years, Mr. Vutha worked for Enterprise Oil as a well site geologist on the drilling rig offshore Cambodia. After which until present, he holds the current position at CNPA.

Annex 4



**CCOP-DANIDA Institutional Capacity Building Project ICB-CCOP1
Sulu Sea—East Sabah Basin & Yinggehai-Song Hong Basin Case Study Workshop,
Training and Expert Visit
2-8 March 2007, Ho Chi Minh / Phu Quoc, Vietnam**

EVALUATION FORM

We would appreciate if you would complete this evaluation form and return to the Secretariat Staff.
Please mark the appropriate box, and include your comments.

Description	Excellent			Unsatisfactory	
	5	4	3	2	1
1) Were the Guest speakers well prepared?	25	4	2	-	-
2) Were the Guest speakers knowledgeable?	24	6	1	-	-
3) Workshop, Seminar & Training presentations	20	9	2	-	-
4) Did the Guest speakers/Seminar & Training help you with your needs and requirements?	15	15	1	-	-
5) Was there a good mixture of theory and practice?	18	12	-	1	-
6) Were the examples good?	21	8	2	-	-
7) Was the Seminar & Training relevant to your job?	20	9	1	1	-
8) Overall Workshop, Seminar and Training assessment.	19	11	1	-	-
9) Did you enjoy the Workshop, Seminar and Training?	24	6	1	-	-
10) Did the Workshop, Seminar and Training meet your expectations?	19	11	-	1	-

11) Please clarify if you missed something.

- Some participants think the presentations from instructors should be distributed.
- Some participants would have liked the training to incorporate more field works and more varieties of core examination instead of lectures. Thus, some think the training should be scheduled for longer period.
- Some think the level of the training course was too basic.
- One participant expected to discuss experience and knowledge in high pressure, such as the accumulation, migration and generation. Another would like to involve seismic section to gain better image of slope deposit.

EVALUATION FORM

12) How many people in your institution/company/organization will benefit from the Workshop, Seminar and Training? (please give an estimation)

Estimation of beneficiaries is ranged from 1 to more than 50. Averagely, 17 people from each organization would benefit from the training.

13) What changes do you think could be made to improve the Workshop, Seminar and Training? (quality of Workshop, Seminar and Training handout, content, venue, facilities, etc.)?

Similar comments from a few responders

- Organizer should accommodate the level of training to target participants' background. Some state that the contents are too basic.
- Field work should be longer than ½ day to see the actual implication of theory and practical aspects. Another suggests field work in the morning.
- A few participants are happy with overall quality.

Other comments

- Presentation materials should be distributed before the event.
- There should be more seismic data and well data presented.
- All handouts should be made in colour.
- More local and regional examples should be included.

14) Perspectives after the Workshop, Seminar and Training. How would you put value to the knowledge learned?

- All evaluation responders are satisfied with the experience, knowledge and networking gained from activities, and mention that they will be able to apply the knowledge learnt into their work in each country both now and in the future.

15) Comments on the food, accommodation and the venue for the Workshop, Seminar and Training?

- Most are satisfied with the quality of food, accommodation and venue. Some complain about sound system, amenities and the grade of Phu Quoc venue.

16) Suggestion of topics to other ICB activity.

- Inter-country data review or discussion on CO₂ distribution
- Gas hydrate discussion in the future
- detailed sequence stratigraphy and basin modeling study
- advanced lectures should be incorporated as most participants are from oil companies
- petroleum system
- development engineering for increasing production
- the relationship between high pressure and hydrocarbon
- tectonic controlling sedimentary distribution
- Integration of seismic, field work and well data for better understanding of petroleum geology in (study area)
- Seismic interpretation
- Wellsite geologist
- wireline logging
- age correlation (eg. late Miocene, Cretaceous)