# JFES NewsLetter

Japan Formation Evaluation Society – A Chapter of SPWLA

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JFES Newsletter
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JFES 会員の皆様へ

東北関東大震災により被災された皆さま、ご家族の方々には、心よりお見舞い申し上げます。皆さまの安全と一日も早い復旧をお祈り申しあげます。

今回の大震災に対しては、SPWLA 会長の Matt Bratovich 氏、前会長の Terry Quinn 氏よりお見舞い・応援メッセージを頂いております。また、震災直後に開催された Abu Dhabi Topical Conference でも日本の状況が紹介され JFES への応援メッセージが発せられております。

我々は世界と共にあります。一日も早い日本の復興のためには、各企業、個々人が自分たちに与えられた役割を精一杯果たし、震災前それ以上に活力ある日常を取り戻すことだと思います。そのために JFES も微力ながら力を尽くしたいと思いますので、皆様のご協力をよろしくお願い申し上げます。

（JFES 会長　宮入　誠）

## Invitation to the 75th Chapter Meeting

We are pleased to announce that the forthcoming Chapter Meeting will be held as follows. Those who are interested in attending this meeting are asked to inform Shizu Kobayashi (kobayashi4@slb.com) **by April 18.**

**Date & Time:** **Thursday April 28, 2011, 15:30 – 17:30**
**Venue:** **Mitsui Oil Exploration CO., LTD.**
Presentation Room A, 10th floor
Hibiya Central Bldg., 2-9 Nishi-Shimbashi 1-chome
Minato-ku, Tokyo 105-0003
Tel: 03-3502-5786 http://www.moeco.co.jp/

**Program:**

**15:30 – 16:30 1st Talk**

Seismic Velocity Variations in the northern Phitsanulok Basin, Onshore Thailand

By Yasutomo Fujii, Mitsui Oil Exploration Co.,Ltd

**16:30 – 17:30 2nd Talk**

Estimated erosion thickness at a time of Middle Miocene based on shale compaction method using Sonic Log in the Gulf of Thailand

By Masashi Fujiwara, Mitsui Oil Exploration Co.,Ltd

**Abstract:**

(1) Seismic Velocity Variations in the northern Phitsanulok Basin, Onshore Thailand

by Yasutomo Fujii, Katsuro Moriyama and Masayuki Orito, Mitsui Oil Exploration Co.,Ltd

The Tertiary Phitsanulok basin is well known for the Sirikit field, discovered by Shell and currently operated by PTTEP, as the largest onshore oil field in Thailand. However, despite additional exploration by Shell and other operators no commercial oil field had been discovered in the northern part of the basin. Moeco, who has produced oil and gas in the Gulf

of Thailand as a non-operator for 30 years, applied the technologies used in the Gulf, and successfully discovered oil in the onshore area.
Based on the sonic log data of exploration wells and 3D seismic velocity data, Moeco found out that the sediments in the western side of the sedimentary basin have faster P wave velocities than those in the eastern side. It was determined that Calcite cementation in sandstone layers caused porosity reduction and P wave velocity increase. Moeco is trying to identify areas of better reservoir composed of sandstones with slower velocities.

②Estimated erosion thickness at a time of Middle Miocene based on shale compaction method using Sonic Log in the Gulf of Thailand

by Masashi Fujiwara, Mitsui Oil Exploration Co.,Ltd

In the Gulf of Thailand more than 30 oil and gas fields have been discovered since the first discovery was made at the Erawan structure in 1970. Most discoveries are located in the Pattani Trough and are of Tertiary age. The Pattani Trough is rift type sedimentary basin and is approximately 200 kilometers length and 70 kilometers in width. Maximum thickness is more than 8,000 meters divided into five sedimentary units from Seq.1 to Seq.5. Although it is well understood in the Gulf of Thailand that the Middle Miocene Unconformity (MMU) of 10.5 Ma is commonly observed in the offshore South East Asia, its erosion thickness and its tectonic study are not well documented because its eroded surface is located in Seq.4 in which key marker beds are poorly developed due to the predominant continental sedimentation.

There are some common methods to estimate erosion thickness such as a) well and seismic correlation, b) stratigraphic correlation, c) vitrinite reflection correlation, d) velocity correlation, e) shale compaction trend (Magara, 1976) etc. In the Gulf of Thailand it is almost impossible to correlate wells in Seq.4 in which the MMU is overlaid. Therefore shale compaction trend method was applied into the 6 gas fields including the Erawan gas field located in the southern part of the Pattani Trough because there are enough well data. from almost the seabed to Total Depth. Its erosion thickness in the subject gas fields were estimated to be approximately 6,500 to 8,000 feet based on the shale compaction trend analysis using sonic log data in which there are more than 50 wells. Significant erosion of the other gas fields was obtained. We will discuss about this method and its results.

**17:30 - 19:00 Icebreaker** (1,000 yen)

〈三井石油開発株式会社への案内図〉

# Best Paper of the 16th Formation Evaluation Symposium 2010

Best paper was selected from 27 papers presented at the 16th Formation Evaluation Symposium held at JOGMEC-TRC on October 7-8, 2010. For this selection, Board members reviewed every paper at the last board meeting and chose the awarded paper by the voting. The testimonial will be given to the awardees at the coming JFES Symposium of this year. The awarded paper and the authors are shown below.

## ANALYSIS OF FRACTURE FLOW WITHIN RESERVOIR CORE SAMPLE UNDER CONFINING PRESSURE BY NUMERICAL MODELING COUPLED WITH X-RAY COMPUTED TOMOGRAPHY

**Noriaki Watanabe[1], Takuya Ishibashi[1], Yutaka Ohsaki[2], Yoshihiro Tsuchiya[3], Tetsuya Tamagawa[2], Nobuo Hirano[1], Hiroshi Okabe[3], and Noriyoshi Tsuchiya[1]**

[1.] Tohoku University
[2.] Japan Petroleum Exploration Co., Ltd.
[3.] Japan Oil, Gas and Metals National Corporation

The authors have proposed a new methodology for coupling a high resolution X-ray computed tomography and a detailed numerical flow modeling to characterize heterogeneous flow patterns in cores which include multiple fractures. The paper demonstrates that the proposed methodology is able to capture channeling flows within fractured core samples clearly according to increasing confining pressure. The change of the flow pattern is consistent with a change in the onsets of breakthroughs that is observed in the core-flood experiments using NaCl and NaI aqueous solutions. This consistency supports an effectiveness of the proposed methodology. This paper casts a new light on a characterization of fluid flow in fractured reservoir core samples, which is one of the key issues for optimizing developments of oil/gas fractured reservoirs and/or geothermal reservoirs. The paper is worth to receive the best paper for the JFES Symposium 2010.

筆者等は、複数のき裂を有するコアの不均質流れのキャラクタリゼーションため、高分解能を有するX線CTと数値流動モデリングを組み合わせる手法を提案した。論文は提案手法の適用によって封圧上昇に伴うき裂コアサンプル内の優先流路を明瞭に捉えられることを示している。この変化はNaCl溶液とNaI溶液を用いたコアフラッド実験時のブレークスルー開始時刻の変化と定性的には一致する。これらの結果は提案手法の有効性を裏付けるものである。本論文は油ガスのフラクチャー型貯留層および地熱貯留層の開発の最適化において重要な課題となっている複雑なフラクチャーネットワークの流体流動キャラクタリゼーションに新たな切り口を与えるもので、JFESシンポジューム2010のBest Paper受賞に値する。