2013년도 제5차 해외전문교육 개요

1. **교 육 명** : 『Well Log Interpretation』

2. **교육수준 :** Intermediate

3. **교육기관 :** SCA社 (미국)

4. **교육일시 :** 2013. 8. 26(월) ~ 8. 30(금), 9:00 - 18:00

5. **교육장소 :** 해외자원개발진흥재단 석유가스교육연구센터(역삼동)

6. 교육설명

Log analysis remains a vital component to many facets of the petroleum industry, from quantification of hydrocarbon reserves, developmental strategies, to real-time decision making for reservoir navigation. This 5 day course addresses the fundamental tenets of log analysis and its role in petrophysics and formation evaluation, using integrative perspective of multiple datasets, including geological, geophysical, logging and core data. You will learn the latest logging technologies and analyses to understand

better petrophysical analysis, formation evaluation, and reservoir characterization. Pros & cons of key log types will be addressed, with emphasis on need for integrative studies and selection of tool combinations to resolve key issues. You will learn quick-look qualitative techniques as well as quantitative aspects such as volume of shale/clay, porosity, permeability, and water saturation determinations. Significant worldwide case histories are included, as well as several exercises designed to provide hands-on experience.

7. 세부내용

1. Welcome and Introduction – Discussion of the "need" for petrophysical analysis and formation evaluation, including integrated core and log analysis with worldwide case examples, illustrating their importance to hydrocarbon exploration and production.

2. Rock and Fluid Properties – Classification and identification of clastic and chemical sedimentary rocks; Impact of weathering, burial, and lithification on sedimentary rocks; Cement types and origin; Porosity and permeability; Impact of grain arrangements, matrix materials, and fluid types; Water saturation determination (basic Archie analysis and complex modifications); Pressure analysis.

- Flow anisotropy and well placement (exercise).

3. Aspects of Drilling and Logging – Mud logging; Core acquisition and interpretation; Wireline and LWD logging and imaging; Analogue studies.

- Well correlation (exercise).

4. Nuclear Log Analysis – Gamma ray log analysis, including spectral GR; Volume of shale (Vsh) analysis (exercise); Density log analysis, including bulk density calculation; Photoelectric effect log analysis; Neutron

porosity log analysis; Lithology/porosity determination; Neutron capture spectroscopy.

- Lithology/porosity determination (exercise)

5. Resistivity Log Analysis and Water Saturation – Resistivity log types (esp. induction, lateralog, propagation resistivity); Invasion profile (microresistivity and array resistivity); Water saturation (Sw) models and determination; Calculation of Archie parameters; Resistivity anistotropy and laminated sequences; Azimuthal resistivity and reservoir navigation.

- Water saturation (Sw) determination (exercise)

- Determination of "n" parameter (exercise)

- Clay conductivity and Sw (exercise)

- Laminated sequences (exercise)

6. Spontaneous Potential Log Analysis – basic concepts and theory; shale effect; hydrocarbon response; bed thickness effect; inversion effects; correlation and sedimentologic analysis; interpretation examples.

- Integrated Rw analysis (exercise)

7. Acoustic log analysis (compressional, shear, and Stoneley waves) – Compressional, shear, and Stoneley waves; mode conversion; acoustic porosity; Vp/Vs ratio; synthetic seismic.

- Porosity and bulk volume hydrocarbons (exercise)

8. Nuclear magnetic resonance – NMR principles; hydrocarbon and water typing; NMR permeability.

- Hydrocarbon and water typing (exercise)

9. Azimuthal (image) log analysis – introduction to image log analysis; wireline FMI and acoustic images; LWD gamma ray, resistivity, acoustic, density, photoelectric effect image logs; log presentation and

visualization; dip analysis; role of images in structural/stratigraphic analysis, wellbore stability, reservoir navigation, azimuthal petrophysics, etc.

    - Dip determination (exercise)

    - Reservoir navigation (exercise)

    10. Integrative Analysis of Multiple Log Types – cross-plotting porosity log types; tri-porosity analysis; water saturation and water cut determination; Pickett crossplot; Hingle crossplot.

    - Pickett crossplot (exercise)

    11. Summary and Concluding Remarks – The present state and future role of petrophysical analysis and formation analysis; Final Q&A session.

8. 강 사 : James. J. Willis, Ph. D, P. G.

  ㅇ 국적: 미국

  ㅇ 직위: President

  - Prospect and field development and evaluation
  - Consulting
  - Short course
  - Field trip instruction
  - Research

  ㅇ 언어능력: 영어(Native)

    <첨부> 강사이력서 1부. 끝.