

## **1. PROJECT PROSPECTUS**

The objective of the project is to compare different test methods and determine bias, if any of particular methods relative to others. The JOINT-VENTURE COMPANY offers for subscription a project aimed at introducing NMR technology into Libya for the purpose of:

1. Screening reservoirs to find which would benefit from the use of NMR logs
2. Enhancing the understanding of the petrophysical properties of Libyan reservoir rock by using NMR core analysis technique
3. Creating pseudo-NMR curves from conventional log responses
4. Developing a catalogue of NMR parameters for calibrating NMR logs in Libyan reservoirs
5. Training individuals in the Libyan petroleum industry on methods of interpreting and applying both NMR core and log data.

## **2. PROJECT CONCEPT**

NMR tools are only recently available in Libya. Nevertheless, the body of knowledge on NMR petrophysics, which developed over the past 10<sup>+</sup> years, offers opportunities for people not only to acquire understanding and skills, but also to put the data to practical use immediately even without having NMR log data.

A survey of oil-company representatives indicated that advancing NMR applications requires accumulating a substantial database simply to get a feeling for the range of proton relaxation behaviour in different rock types. The opinion of these representatives stimulated the development of a worldwide NMR rock catalogue for sandstones and carbonates completed in the mid-1990's. The catalogue proved useful for research and development and revealed gaps in our understanding of how to calibrate NMR logs.

Today, however, this database is incomplete because of:

1. Changes in tool design
2. The need to have core measurements on samples containing multiple fluid phases
3. Advance in software technology, data manipulation
4. Improved understanding of how to apply such data.

For example, the original rock catalogue contains NMR core experiments solely on brine-saturated samples. The NMR response in oil and water are different, and therefore a complete database needs measurements made on native- or restored –state samples. Additionally, previous ideas of how to use NMR core analysis data have changed significantly, especially in view of improved signal: noise and polarisation capabilities of wireline tools

Perhaps more important for reservoirs in a country where NMR technology is awaiting introduction, interpretation strategies and methodologies for making log calibration must accompany a catalogue of NMR responses. Such a complete document will serve as:

1. A database for understanding variations in reservoir properties
2. A catalogue of pore types unavailable from other sources
3. A link to rock types and laboratory capillary pressure measurements
4. A methodology for developing pseudo-NMR logs from conventional log data
5. A screening technique for reservoirs to identify where NMR logs would prove most beneficial and therefore most economic
6. A catalogue for calibrating NMR logs once the technology is fully established in Libya.

For a full prospectus of this project please contact [sales@corex.co.uk](mailto:sales@corex.co.uk)