



## TRACERS IN RESERVOIR DESCRIPTION

- Research on and development of experimental and theoretical methods for the use of tracer technology in well-to-well examinations of fluid flow (injection waters and injection gases) in secondary and tertiary recovery schemes in oil reservoirs.
- Implementation of these methods in field projects throughout the world.

### BACKGROUND

Through the last 40 years IFE has developed experimental and theoretical tracer technology methods for environmental and industrial application. During the last 20 years the focus has been on the oil and gas industry. This has led to improved knowledge of traditional (radioactive) tracers and development of a number of new non-radioactive tracers for water and gas flow in petroleum reservoirs. These new tracers have become industry standards and are used in field operations throughout the world. The successful development and field implementation has placed IFE in the forefront of reservoir tracer technology

### INTERWELL EXAMINATIONS

The main purpose of interwell (or well-to-well) tracer tests is to map the flow field in the reservoir and to monitor qualitatively and quantitatively the *fluid connections* between injection and production wells.

Tracer data in combination with ordinary fluid production data, pressure testing and well logging information (including injection profiling) gives the best available basis for evaluation of the dynamic reservoir fluid flow pattern and thereby for the

optimal reservoir exploitation. Recently, we have started to look into combination of data from tracer tests and 4D seismics. The combination of techniques guides decisively in positioning of in-fill wells.

### RESEARCH & DEVELOPMENT

The state-of-the-art tracer methods available at IFE today are based on in-house basic and applied research in laboratory and field examinations as well as in theoretical investigations. This development is in general carried out in two phases addressing the following main areas:

- Tracer behaviour at simulated reservoir conditions.
- Tracer analytical methods
- Tracer production and handling
- Tracer modelling and simulation
- Field pilot projects.

### CUSTOMERS

Customers are oil companies worldwide. Among our customers are BP, Cepsa, ConocoPhillips, ChevronTexaco, DNO, DONG, Dove, Hess, Norsk Hydro, Mobil, Mærsk, NAM/Shell, Perenco, Petrobras, PDVSA, RWE-DEA, Saudi Aramco, Sincor, Statoil, Total, Wintershall, Woodside

