

Advanced technology – the basis for our business



Most of the innovations in industry today take place at the interfaces between different areas and disciplines. In this regard, ABB's Oil, Gas & Petrochemicals businesses – the subject of this *ABB Review* – are no exception. In fact, such interdisciplinarity is our unique strength.

As an industrial group with a strong and broad technological portfolio, several elements of which are leading in their industry, ABB has already produced a series of major technological breakthroughs. While a number of them are described in this publication, some deserve special mention.

■ It is commonly known that ABB managed to move very quickly in the area of subsea separation and injection (SUBSIS); in fact, we won the first significant contracts only 18 months after coming into this area. One of the main reasons we were able to act so quickly was our ability to rapidly put together a team of people with widely varying skills and to create an environment in which they could work together successfully. Last year, SUBSIS was installed on the bed of the North Sea, and six weeks ago it started operation.

■ Driven by environmental awareness, ABB has developed a novel catalytic process to make high octane gasoline components by alkylation. The essential feature of this is a Solid Acid Catalyst that replaces the liquid catalysts currently used. In this way, potential health and environmental concerns are avoided without sacrificing cost effectiveness. The R&D phase has been successfully concluded and ABB plans to build a demonstration unit in the near future.

■ We are also looking at the next paradigm shifts for the industry, both upstream and downstream. For example, increasing numbers of operations underwater and on the seabed require ever more electrical power. ABB's leading position in power transmission and distribution has also put us in a unique position to deliver innovative solutions for the industry. In cooperation with other companies we have developed solutions which we believe will be of great value to the users. For the downstream petroleum refining and chemical industry, we are making catalysis a core competency area. We are emphasizing this area as one for future growth by working together with top universities, institutes and strategic partners. The goal is to provide cost-effective process technologies for products that are clean and environmentally friendly.

In this issue of *ABB Review* we are proud to present some of our recent technological achievements in Oil, Gas and Petrochemicals.

We are committed to continuing our high level of effort and investment in R&D in these areas in order to create value both for our customers and ourselves alike.

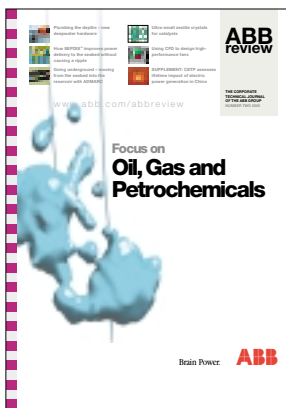
Markus Bayegan

Senior Corporate Officer
ABB Group R&D and Technology

Technology to realize the visions

From 'Pore to Pour'

ABB's activities in Oil, Gas & Petrochemicals extend from recovering the hydrocarbons from the reservoir itself to manufacture of the finished consumer products.



This computer-generated 3D picture plots the distribution of micro-seismic events in an oil reservoir over several days. These small earthquakes, caused by small fracture slippage – usually induced by extracting oil or gas from rocks – are detected by geophones placed deep (to depths of 5 km) in the reservoir. The micro-seismic activity yields important information about reservoir structure and fluid flow hitherto unobtainable, and enables engineers to more fully exploit reserves. The financial returns on even modest recovery rate increases are very significant.

All economic indicators are now pointing towards a new upturn in the Oil, Gas & Petrochemicals industry worldwide. At ABB we have prepared well for this upturn by strategic acquisitions and heavy investments in technology programs to meet the technology and business challenges of the coming years. Some of the most important of these technology development programs are presented in this issue of *ABB Review*. All these programs have certain common targets related to improved reservoir recovery, more efficient upstream and downstream plants and, importantly, reliability and availability.

On the upstream side of our business the main challenges are related to the fact that most of the 'easy' offshore fields have been found and developed, whilst the majority of the future fields are more complex and in deeper waters. The life of the existing fields must be prolonged and the new fields must be developed at costs of around US\$8 per barrel. The market does not pay more for oil and gas because it comes from a complex field in deep water. At the same time, the new developments must be sustainable from an environmental point of view, with considerably reduced energy consumption and emissions as close to zero as possible.

For the downstream side of the industry the main focus will be on technology developments that assist us in maintaining our strong market position in petrochemicals and which complement



existing lines of technologies. Strategic acquisitions will also play a vital role. In the petroleum refining area the main future challenge is the development of solutions for clean fuels. Reducing pollution and minimizing environmental impact are key considerations. In order to be successful we must strengthen ABB's competency in catalysis.

The combined strengths of ABB within petroleum technologies and chemistry, power transmission and distribution, and automation and industrial IT, puts us in a unique position to be the leader in what we expect to be a silent technology revolution within the industry.

We intend to utilize this position, and take the lead. I invite you to join us on our tour of the future.

Gorm Gundersen
Segment Manager
Oil, Gas & Petrochemicals