PETROLEUM REVIEW

IP THE INSTITUTE OF PETROLEUM

January 1997

Retail Marketing
IP conference looks at Central European issues

Spain
Arrival of Algerian supplies heralds gas expansion

Refining
Responding to European refiners' hydrogen needs

Oxygenates in a changing fuel market

IP
THE INSTITUTE OF PETROLEUM

IP Week Conferences

IP Week is the focal point in Europe when leading figures in the oil and gas industry migrate to London for an intensive round of conferences, industry and trade association events, company meetings and social functions. The Institute's own programme of events is the central focus for these activities.

Monday 17 February

Financing the International Oil Industry — The Continuing Challenge

The provision of finance to meet the massive capital investment requirements of the next decade represents one of the greatest challenges facing the international oil and gas industry. This international conference will address the key issues including international equity and debt markets, complex financings and asset-based finance as sources for the oil industry, financing the reconstruction of the energy industries in the Former Soviet Union and oil trade finance.

Speakers include:

- Mr Steve Lucas, British Gas plc
- Mr Andrew Shilston, Enterprise Oil
- Mr Ronald Freeman, European Bank for Reconstruction and Development.

Tuesday 18 February

The 10th Oil Price Seminar: Managing the Short-Term Risk

The annual IFEG Oil Price Seminar examines the information used to predict future movements in the price of crude and refined oil products and addresses the techniques available to handle short-term risk. This important seminar offers risk managers, traders, marketers, analysts, information providers and forecasters the opportunity to hear the latest expert opinion and to sample the most up-to-date information services.

Speakers include representatives from an oil major, a trader and a specialist derivatives company.

Thursday 20 February

Achieving Competitiveness through Innovation and Value Engineering — How Lessons from the Upstream Can Be Applied to the Downstream and Beyond

'ACTIVE' seeks to adopt the principles learnt in the offshore and other industries, to bring about a similar step-change in practices in the process industries and achieve a commensurate reward in terms of overall long-term competitiveness. This conference will review the lessons so far from CRINE, while enterprises that have already applied this radical approach to downstream activities will report on their experiences and successes.

Chaired by Sir Alan Cockshaw, Chairman, AMEC plc

Speakers include:

- Mr Tim Eggar MP, former UK Minister of Industry and Energy
- Mr Arthur McQuillan, Director, ACTIVE
- Mr John Wils, Director Aberdeen, UKOOA

For further information please contact:

Conference Department, Institute of Petroleum,
61 New Cavendish Street, London W1M 8AR UK
Tel: +44 171 467 7100 Fax: +44 171 255 1472

PETROLEUM REVIEW

JANUARY 1997 VOLUME 51 NUMBER 600 • £8.00 • SUBSCRIPTIONS (INLAND) £95.00 (OVERSEAS) £110.00

EDITORIAL

Editor: Carol Reader
Deputy Editor: Kim Jackson
Production Editor: Emma Parsons
61 New Cavendish Street, London W1M 8AR
Telephone: (0171) 467 7100
Fax: (0171) 255 1472

ADVERTISING

Alison James
Anne Marie Fox
Classified: Elaine Smith
Landmark Publishing Services
8 Garrick Street
London
WC2 9BH
Tel: 0171 240 4700
Fax: 0171 240 4771

PUBLISHERS

Published Monthly by
INSTITUTE OF PETROLEUM
A charitable company limited by guarantee

Director General: Ian Ward

61 New Cavendish Street, London W1M 8AR
Telephone: (0171) 467 7100
Fax: (0171) 255 1472

IP THE INSTITUTE OF PETROLEUM

For details of subscriptions, please apply to Anne Poynter at the Institute of Petroleum
Tel: 0171 467 7124

Printed by The Thanet Press Ltd, Margate

US MAIL: Petroleum Review (ISSN 0020-3076 USPS 006997) is published monthly for US$185 per year by the Institute of Petroleum. Second class postage paid at Middlesex, New Jersey.
Postmaster: send address changes to Petroleum Review c/o Pronto Mailers, PO Box 177, Middlesex, New Jersey 08846, USA.

ABC BUSINESS PRESS
ISSN 0020-3076
MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS

CONTENTS

COVER PHOTO
Laying the Maghreb gas pipeline

News in Brief

13 November
Chevron has signed a letter of intent with the Bahrain National Oil Company to evaluate jointly the potential for upstream ventures in Bahrain and examine enhanced oil recovery techniques for the continued development of the Bahrain oilfield.

14 November
Pogo Producing Company has signed a memorandum of understanding with the Petroleum Authority of Thailand for the sale and purchase of crude oil and condensate from the new Tantawan field in the Gulf of Thailand.

15 November
The start-up of the Conoco-operated MacCulloch field in the central North Sea has been delayed until early 1997. It awaits delivery of the floating, production, storage and offloading vessel currently undergoing final commissioning at Teesside.

16 November
PGS Exploration is to carry out a 3D seismic survey in the deepwater Mississippi Canyon area of the Gulf of Mexico on behalf of Shell.

17 November
The Arkwright field has flowed first oil ahead of the 1 December schedule date. Located in block 22/23a in the North Sea, the field will initially produce at about 8,000 b/d but is soon expected to exceed its design rate of 12,000 b/d.

Emerald Energy has announced a second 1bn barrel onshore oil target in Colombia's rich Upper Magdalena Basin. A £7.5m institutional share placement will fund drilling costs for two wells on both the Gigante and Chawina finds.

19 November
Petronas is to take over as operator of Vietnam's Dai Hung oilfield from Broken Hill Proprietary Company, subject to government approval, according to *Lloyd's List*.

Ships and tankers sailing off the coast of northern Scotland carrying dangerous or polluting cargoes are being encouraged by the UK government to fit automatic ship identification transponders. Such units respond automatically to interrogation from the shore, removing the anonymity of ships, and will allow HM Coastguard to closely monitor vessel movements.

Kvaerner Process Technology Ltd has signed a $20m contract with China Petro-Chemical International Company of Beijing for an oxo alcohols plant expansion to be undertaken by Sinopec Qilu Petrochemical Corporation of Shandong Province.

Oryx Energy reports that it has pushed fourth quarter production over 19 million equivalent barrels following the successful testing of the M-38 and H-38 development wells on the Murchison and Hutton fields which flowed at 13,000 b/d and 15,000 b/d respectively.

20 November
Ernst & Young has formed an alliance with Hannon Westwood Associates and IKODA Limited to offer a multi-disciplinary facility to clients in the oil and gas exploration and production industry who are involved in the disposal and acquisition of licence interests.

Japanese trading company Mitsui has signed a Y19bn turnkey contract with Uzbekistan for an oil processing plant that will play an instrumental role in the country's drive to become self-sufficient in energy, reports the *Financial Times*.

21 November
Agip has reached a frame-work agreement with Libya for the development of Libyan gas fields and the construction of a gas pipeline to Italy, reports *Reuter*. The project, thought to be worth $2.1bn, is unlikely to get underway before 2001.

22 November
Faudi Filtersystems has opened a new research and development centre at Stadtallendorf in Germany. The facility features an aviation fuel filtration test rig with a maximum flow rate of 10,000 litres/minute and 200,000 litre storage capacity.

Elf Aquitaine has sold some 400,000 shares (approximately a 10 percent interest) in the Compagnie Générale de Géophysique through the Banque Nationale de Paris.

25 November
Ranger Oil is to acquire the reserves and land interests in the Helmet/Midwinter area of northeast British Columbia from Gulf Canada Resources for some $21.7m. The acquisition includes estimated natural gas reserves of 46 bncuft and approximately 50,000 acreas of exploratory lands.

The Port of Aktau, on the Caspian Sea in Kazakhstan, has awarded a £25m contract for the rehabilitation of a breakwater and associated port facilities to UK company Mouchel. The level of the Caspian Sea has risen by more than 2 metres over the past 20 years and the port currently suffers from frequent inundation.

26 November
North Carolina-based elec-tricity utility Duke Power has announced plans to acquire PanEnergy Corp, a US gas pipeline operator, in a deal worth some $7.7bn, according to the *Independent*.

27 November
The International Petroleum Exchange has announced Europe's first natural gas futures contract. It will begin trading 31 January 1997.

28 November
Occidental Petroleum and Texaco have signed an exploration contract for Bohai Bay in China with China National Offshore Oil Corporation.

2 December
European Marine Contractors Limited is to install some 700 km of pipeline in the North Sea and 900 km in the Far East over 1997 and 1998 following the award of a number of new contracts. The most recent award is a contract from Statoil worth some £40m for the Norfra gas trunkline landfall and trenching work.

3 December
Stolt Comex Seaway has secured an $8m contract for the supply and installation of a flexible fuel gas flowline for Oryx' Hutton tension leg platform, together with a flexible riser and subsea installation valve.

4 December
Kerr-McGee Oil (UK) has taken over as operator of the Janice field. Three appraisal wells tested at a total rate in excess of 30,000 b/d.

6 December
Repsol is to acquire Norsk Hydro's 63.64 percent participating interest in and the operatorships for the Ras Kanayes and Ras El Hekma concession areas in the Western Desert in Egypt.

9 December
Enterprise Oil has discovered oil in block 13/21a, some 2 km west of the Captain field. The well has been plugged and abandoned without testing. A 3D seismic programme is planned in 1997.

10 December
Chevron has signed an association contract with Empresa Colombiana de Petroleos to explore the Galeron block in the Llanos foothills in Colombia. The contract area lies adjacent to the giant Cusiana oilfield and on trend with a number of new crude oil and gas discoveries.

London Exploration and Production Company has acquired a 0.5 percent interest in the Forties and Brimmond oilfields from Cairn Energy, increasing its total interest in these fields to 0.75 percent.

Newsdesk

Road users pay the price for 'green' taxes in latest UK budget ...

In last November's budget the UK Chancellor of the Exchequer, Kenneth Clarke, announced a number of 'green' taxes aimed at reducing vehicle emissions and improving air quality. Duty on natural gas fuel was reduced by 25 percent, while vehicle excise duty (VED) for lorries and buses fitted with particulate emission traps or those that switch to the use of natural gas will be reduced by £500 from 1998.

However, the impact of such measures will be small. Not only is the cost of converting vehicles to the use of alternative fuels such as compressed natural gas high — in the region of £10,000 for a lorry and £2,000 for a car — there are relatively few natural gas refuelling stations (under 100) in the United Kingdom at present.

Furthermore, it is unlikely that this network will expand to any great extent until operators receive capital grants to build such facilities.

Particulate traps, too, are an expensive option costing in the region of £4,000 per unit.

Mr Clarke also announced a 1 pence reduction on duty for 'cleaner' ultra-low sulfur diesel — to be implemented in May. According to Greenergy, City Diesel ultra-low sulfur fuel not only reduces the level of vehicle exhaust particulate emissions and emissions of sulfur dioxide but also cuts exhaust emissions of nitrous oxides, hydrocarbons and carbon monoxide, when compared with 'ordinary' diesel.

However, UKPIA has criticised the decision to reduce duty on this particular fuel. 'Extensive studies have shown that ultra-low sulfur diesel is not a cost-effective way of tackling urban air pollution,' said UKPIA Director General Dr Michael Frend. Instead, the organisation believes that technical solutions such as particulate traps are a more 'cost-effective way of tackling particulate emissions at source' and, as a result, it fully supports the government's decision to subsidise investment in such units as well as the tax incentives aimed at encouraging the use of alternative, 'cleaner' fuels such as compressed natural gas.

Others have voiced concern that any large increase in demand for ultra-low sulfur diesel may necessitate imports from elsewhere in Europe as there are only two refineries in the United Kingdom capable of producing the fuel at present. Heavy investment would be required to bring the rest of the UK refining sector in line.

Duty on petrol and 'ordinary' diesel, meanwhile, was increased by 3 pence per litre in line with current government policy to increase pump prices annually by five percent plus inflation. This means that the total tax on a litre of fuel is now 75 percent of the price. 'The policy, which has been in force since 1993, has had no impact on fuel sales, is a very blunt instrument and just another way of collecting taxes,' commented UKPIA.

Indeed, the UK petroleum industry will collect a further £1.5 billion this year from UK motorists on behalf of the taxman as a result of this policy.

Unfortunately, the budget also heralded further cuts in the public transport and road-building programmes — both of which require radical overhauls. Indeed, over the next three years, the grant for such programmes has been reduced from £1.7 billion to £1.1 billion, of which just £130 million will go to London Transport.

According to the Freight Transport Association (FTA) figures, some 110 road construction schemes have been shelved including the conversion of the A1 to motorway, the Birmingham western orbital route, A303 Stonehenge bypass, A47 improvements in East Anglia and the east London river crossing.

The decision comes at a time 'when all the pundits are predicting sustained traffic growth for the foreseeable future,' commented FTA. 'The only result will be increased congestion and unreliability.'

Futhermore, the private finance of roads has 'produced a growing forward debt for the roads programme which in future will soak up much of the available cash, bringing the new roads programme to a standstill', concluded the transport organisation.

... while tax relief is cut for production drilling operations

The UK Chancellor of the Exchequer has also abolished the 100 percent, first-year corporation tax relief for intangible drilling costs — such as the costs of chartering mobile drilling rigs and which account for between 70 and 80 percent of well costs — on production wells drilled on the UK Continental Shelf, previously allowed under a 1920 Special Commissioner's decision.

Instead, all such intangible costs will only qualify for the less favourable mineral extraction allowance (MEA) at a rate of 25 percent per year on a reducing balance basis. Thus, tax relief for new wells will be spread over seven years as opposed to one.

There is also a provision to prevent MEA claims by the buyer of a licence interest, in respect of expenditure on which the seller has claimed the 100 percent deduction.

The 100 percent scientific research allowance for exploration and appraisal costs remains unchanged however, as do the arrangements for Petroleum Revenue Tax and royalties.

According to the Inland Revenue, the change in tax relief will save the government some £150 million in 1998-99 and £200 million in 1999-2000. However, this is a relatively small figure when compared with the billions of pounds paid by the UK oil and gas industry in taxes to the government each year.

Revised approval procedures

Lloyd's Register (LR) has revised its type approval procedures to reflect advances in technology, changes in standards including the introduction of new European Union directives, and variations in operational use.

The revisions are due to enter in to force on 1 September. Until that date manufacturers may use either the new arrangements or continue to use the existing system.

Newsdesk

British Gas outlines demerger details and renegotiates take-or-pay contract

The details of British Gas' forthcoming demerger and its first renegotiated 'take-or-pay' contracts were unveiled last month.

British Gas' gas sales, trading, services and retail businesses, together with the Morecambe gas fields, will be brought together under a new publicly listed company called Centrica.

The gas transportation and storage business TransCo and British Gas' exploration and production, international downstream, research and technology and property activities will be placed in the hands of BG plc.

The 'British Gas' brand name will continue to be used by Centrica with customers in the United Kingdom and by BG plc overseas.

Roy Gardner has been appointed Chief Executive, Centrica, and David Varney, (former IP President) Chief Executive, BG plc. Richard Giordano will act as Chairman of both companies.

Subject to approval of shareholders at an extraordinary general meeting on 12 February, shares in Centrica will begin trading on 17 February. Shareholders will receive one Centrica share for each British Gas share.

The creation of the two separately listed companies will enable each to focus on its own strategic direction and removes any scope for internal conflicts of interest and the regulatory disadvantages of common ownership of the natural gas monopoly distribution network, as a totally deregulated gas market is developed.

British Gas also revealed last month that it is to pay £293 million before tax in aggregate compensation relating to the renegotiation of take-or-pay contracts. The amended contracts, one of which is with British Petroleum, reduce British Gas' gas volume purchase commitments by some 2.8 billion therms and cut prices to market levels on a further 13.5 billion therms. The contracts account for some 10 percent of the gas volumes that British Gas hopes to reduce. Additional renegotiation arrangements are currently being discussed.

Saga buys Santa Fe Exploration

Saga Petroleum has acquired Kuwait Petroleum Corporation's (KPC) UK and Irish upstream subsidiary Santa Fe Exploration (UK) Limited for some $1.23 billion. The sale, subject to approval by the UK Secretary of State for Trade and Industry, was expected to be finalised at the end of last year.

Santa Fe has interests in some 44 blocks offshore the United Kingdom and 20 blocks offshore Ireland. Interests are held in four main producing fields — Miller, Alba, Gryphon and Thistle — and in the Britannia and Durward/Dauntless developments. The company also holds significant exploration interests in the frontier areas west of Shetland and offshore Ireland. Proven and probable reserves amount to some 165 million barrels of oil equivalent, while current production averages 50,000 barrels per day.

The deal does not include Kuwait Petroleum International Limited, KPC's UK retail and marketing operation trading under the Q8 brand, or US-based Santa Fe Drilling.

No surprises from OPEC

OPEC ministers met in Vienna last November and came to the expected conclusion — they would roll over the current output ceiling of 25.03 million barrels a day (b/d) for another six months and make no changes to the quotas of individual countries.

This figure takes into account the production of all member countries including Iraq which is now being allowed by the United Nations to export some 500,000 b/d.

However, it must be pointed out that, even without Iraq, this level was already being exceeded by around 1 million b/d. Those states producing well above their quotas include Venezuela and Nigeria.

OPEC member states are pleased with results for last year, since a combination of unexpected factors have led to escalating crude prices. These factors include lower than expected production levels from non-OPEC countries, rising demand for products and delays in the return of Iraqi oil to markets.

The raised levels of oil prices in the latter part of last year brought OPEC treasuries an unexpected revenue bonanza of an estimated $30 billion in excess of earlier forecasts. This has made possible cuts in budget deficits, particularly in Saudi Arabia.

As the higher level of oil prices may well continue, bringing further relief to financial pressures, OPEC obviously does not want to disturb this happy state of affairs.

Phillips and Bechtel form LNG alliance

Phillips Petroleum Company and Bechtel Corporation are to establish an alliance aimed at expanding their roles in the international liquefied natural gas (LNG) market.

According to John Duty, Bechtel's Senior Vice President and Manager, Global LNG, the alliance will provide both Bechtel and Phillips customers with 'greater value, better project economics, lower capital costs, faster time to market and more reliable operations'.

The companies already have a long history of working together. Indeed, Bechtel designed and built the gas liquefaction plant on the Kenai Peninsula in Alaska where Phillips first used its optimised cascade LNG process in 1969. The facility was the first to ship LNG to Japan and is the first in the world to achieve 27 years of uninterrupted supply to Japanese customers.

More recently, the Atlantic LNG Company of Trinidad and Tobago selected Bechtel and the Phillips process for a new LNG complex. The two companies have also established an LNG process development centre at Bechtel's offices in Houston.

Caspian pipeline deal is finalised

Early last month it was announced that an agreement had finally been reached on the restructuring of the Caspian Pipeline Consortium.

The agreement was signed by the three original partners in the consortium set up in 1992 — the governments of Russia, Kazakhstan and Oman. Now new oil company partners have been brought in. They are: Chevron (15 percent equity), Lukoil (12.5 percent), Rosneft/Shell and Mobil (7.5 percent each), Agip and British Gas (2 percent each), Kazak Munaigas and Oryx (1.75 percent each).

The $2 billion, 1,500 kilometre pipeline will mainly export crude from the giant Tengiz oilfield in Kazakhstan to the Russian Black Sea coast. Its ultimate capacity will be 1.5 million barrels a day. Construction is expected to be completed by 1999.

Production at Tengiz, the Chevron/Kazakhstan joint venture, is currently being seriously hampered by the lack of export facilities. Speaking in London recently, James Sullivan, Vice Chairman, Chevron Corp, said that output from Tengiz is currently 100,000 b/d. This could be expanded to perhaps 180,000 b/d via a multitude of existing export means but the potential 700,000 b/d would only be possible when the proposed new export pipeline had been built. With the signing of the agreement, he said, 'We are on our way'.

Diary Dates

Exploration and Production Discussion Group

Review of 1996: forecast for 1997

Thursday 16 January, tea at 17.00 for 17.30 until 19.00

By Ms Amanda Battersby, Deputy Editor, *Euroil*

IP contact: Jenny Sandrock

Energy Economics Group and Exploration and Production Discussion Group

'Falkland Islands: A New South Atlantic Oil Province'

Tuesday 28 January at 17.00 for 17.30 until 19.00

By Dr John Martin, former Oil Licensing Administrator to the Falkland Islands Government

IP contact: Jenny Sandrock

Energy Economics Group/British Institute of Energy Economics

'Middle East Megaprojects after the Millennium — the need to start now'

Tuesday 18 February, at 15.15

By Mr Pierre Shammas, Chairman, APS Group
At the Caledonian Club, 9 Halkin Street, London SW1

Contact: Mary Scanlan, 37 Woodville Gardens, Ealing, London W5 2LL
Fax: 0181 566 7674

Energy Economics Group

The Rt Hon the Lord Fraser of Carmyllie, UK Minister for Energy, will address a meeting of the EEG.

Tuesday 18 March, 17.00 for 17.30 until 19.00

IP contact: Jenny Sandrock

All meetings are held at the Institute of Petroleum unless otherwise stated.
Please tell the IP contact if you plan to attend any of these free meetings
Tel: 0171 467 7100 Fax: 0171 255 1472

Newsdesk

Norwegian asset swap

Norsk Hydro and Statoil have entered into an agreement to exchange licence interests on the Norwegian Continental Shelf.

Under the terms of the arrangement, Norsk Hydro will take a 3 percent interest in blocks 34/7 and 34/8 from Statoil, increasing its share from 18 to 21 percent, in return for Statoil taking an 8 percent interest in block 15/5, increasing its share from 50 to 58 percent. In addition, Norsk Hydro will pay an undisclosed cash sum.

The deal allows Norsk Hydro to increase its share in the Visund field in block 34/8 — currently under development — from 12.65 to 14.7 percent in line with its policy of accruing larger stakes in fields where it acts as operator.

Statoil, meanwhile, will take over operatorship of block 15/5 which contains oil and gas finds that are currently under evaluation for possible development.

A joint operator development project incorporating deposits in the Sleipner area is also under consideration. Norsk Hydro retains a 9.3 percent interest in block 15/5.

Gas transit deal

Wingas and Distrigaz of Belgium have agreed a 20-year contract for natural gas transit between Zeebrugge and Eynatten, near Aachen, at the Belgian-German border.

Subject to final approval by Distrigaz' supervisory board, the contract provides for the transport of one billion cubic metres per year of the total three billion cubic metres per year that Wingas purchased from Conoco and British Gas in 1996 under contracts beginning 1 October 1998.

The natural gas will be landed at Zeebrugge via the Interconnector. Wingas will offtake the gas into its Wedal pipeline connecting the Belgian natural gas pipeline grid with the Wingas pipeline system at Bielefeld.

Iraqi oil exports return

Exports of limited volumes of Iraqi crude have started under the oil-for-food deal finalised last year but held up pending Iraq's acceptance of UN terms.

For the first time in six years the Iraqis are allowed to sell $2 billion worth of crude over a six-month period, enabling them to buy desperately needed food and medicines. This represents around 500,000 barrels a day at present prices.

Implementation of UN Resolution 986, detailing the sale terms, was held up by Iraqi military intervention in the Kurdish areas of northern Iraq last August. President Saddam Hussein was also reluctant to agree to the deal because of his opposition to the UN requirement for monitors to keep checks on the distribution of the humanitarian aid. It was also necessary to agree the pricing formula.

Initially prices reacted by falling but subsequently analysts, having long anticipated this return, decided that for the present markets would be able to absorb these extra volumes, which will be sold during the northern hemisphere winter and at a time when stocks on both sides of the Atlantic, especially for heating oil, are unusually low.

In early December an Iraqi official stated that a number of contracts had been signed with buyers.

The first shipment through the pipeline from the northern fields in Iraq to the Turkish port of Ceyhan was destined for the Turkish state-owned refiner Tupras, which signed a contract to take 75,000 b/d.

Output is likely to build up to the stipulated limit over the next few weeks.

Crude will be exported either by the pipeline through Turkey or from the terminal at Mina Al-Bakr on the Gulf.

Venezuela to upgrade new crude output

Texaco and Phillips Petroleum have joined forces with Corpoven and Arco to produce and upgrade extra-heavy crude oil production from Venezuela's Orinoco Belt.The venture will produce some 200,000 barrels per day (b/d) of 9° API extra heavy crude oil from the Hamaco area south of El Tigre in the state of Anzoategui.

Oil will be transported via pipeline to an upgrading plant to be built in the José industrial complex to the north, where it will be processed into 25° API crude oil with characteristics similar to Alaska North Slope crude which is of higher commercial value on the international market.

The first production and upgrading module is scheduled to become operational in 2001. A second module, which will double capacity to 200,000 b/d, is expected to be operational in 2006.

Some $3.5 billion is to be invested in the project. Corpoven and Arco will each have a 30 percent interest, while Phillips and Texaco will hold 20 percent each.

New North Sea oil find for Amoco

Amoco has discovered oil in North Sea block 22/18 some 130 miles east of Aberdeen. The exploration well flowed at an average rate of 3,500 barrels per day and gas at 10.5 million cubic feet per day.

The discovery is located less than two miles from Amoco's existing Arbroath oilfield. Such close proximity to the Montrose/Arbroath/Arkwright complex should allow the company to utilise existing facilities for a fast-track development. Indeed, Amoco states that subsea development tied to the Montrose and Arbroath platforms is one of the options to be evaluated.

Amoco plans to submit its final development plan to the UK Department of Trade and Industry during the second half of this year with first oil expected in 1998.

Re-refining needs to promote quality image

Today's advanced re-refining technologies are capable of producing high quality baseoil which can equal the performance of virgin oil. Furthermore, the production of re-refined baseoil consumes two-thirds less energy and generates less pollution than the production of new baseoil, while estimates show that nearly 50 percent of the 5.4 million tonnes of new lubricant supplied to western European markets could be collected and recycled.

Although this is good news for a world that is increasingly looking towards the recycling and reuse of resources, energy conservation and reduction of pollution, the European re-refining industry faces a number of challenges, as outlined at the 3rd European Congress on Lubricants Re-refining held in Lyon last October.

Despite the high quality of re-refined oils, the image and recognition of such products remains poor, explained Mr Renato Schieppati, President, European Group of Re-refiners (GEIR).

Active co-operation between Europe's re-refiners was required to both disseminate information and provide quality assurance. Further-more, an economic and legislative infrastructure needs to be created to support such co-operation and encourage investment in re-refining in individual member states.

In order to underpin the development of re-refining into the next century, GEIR recommended a number of initiatives. These include:

- Public government procurement of lubricants with a minimum recycled content to demonstrate government commitment to recycling and to generate a market demand for re-refined oils.
- Application of the European Commission priority for re-refining in individual member states, so that potential investors in re-refining have the guarantee of a reliable supply of used oil.

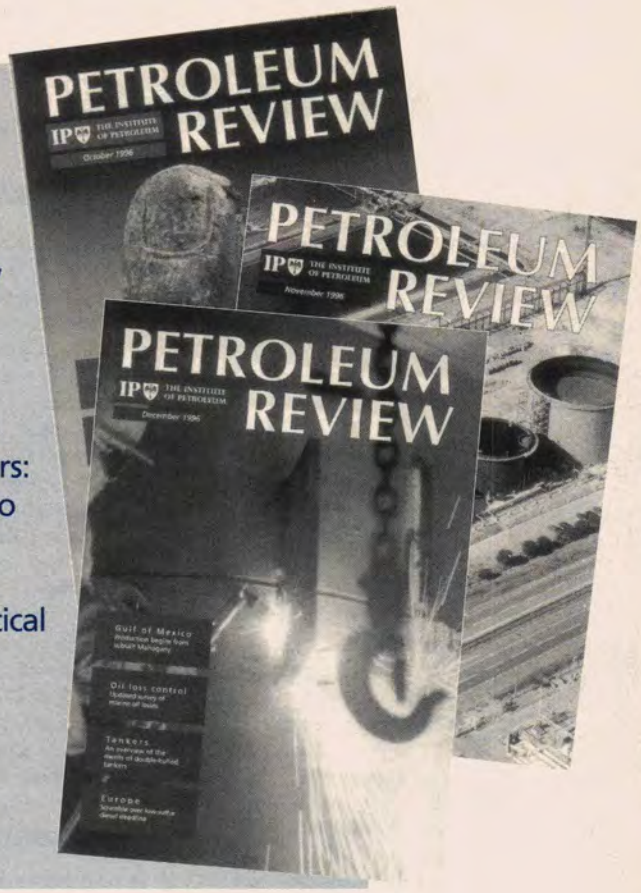
PETROLEUM REVIEW

Petroleum Review helps you to keep up to date and fully informed on advances, trends, changes and events throughout the international oil industry. Why not join the senior executives who regularly read *Petroleum Review*?

Published monthly in the United Kingdom, this leading publication covers the upstream and downstream sectors: from the former Soviet Union to the Gulf, from China to New Zealand and from Libya to Argentina.

Issues are approached from both an economic and a political angle. Technical subjects are also covered in detail.

Subscription rates: £95.00 (VAT zero rated) UK
£110.00 ($170) Overseas
£150.00 ($240) Overseas airmail direct



UK RETAIL MARKETING SURVEY

This comprehensive annual survey of the forecourt retailing business is published annually in March. The wide-ranging and in-depth analysis draws directly from company sources and examines retail trends, sector performance and developing market opportunities.

Over the years, this document has proved to be the industry bible for everyone who is involved in the marketing of fuels in the United Kingdom.

Price: £50.00

Yes, I want to subscribe to *Petroleum Review*

Please send me _____ copies of the UK Retail Marketing Survey

Here is my cheque for £_____ made payable to the Institute of Petroleum.

Name _____

Job title _____ **Company** _____

Address _____

_____

Please return this form to: Petroleum Review, 61 New Cavendish Street, London W1M 8AR

Newsdesk

Marine pollution

As part of the Marine Accident Investigation Branch (MAIB) investigation into the grounding of the *Sea Empress* off Milford Haven in February last year and the subsequent salvage operation, MAIB has questioned whether the National Contingency Plan and government Powers of Intervention are adequate.

'The content of the Marine Pollution Control Unit's (MPCU) National Contingency Plan is broad based to cover a wide range of possible incidents but it lacks clarity in a number of areas,' it argues. 'However, the most significant failing is that it is not a legal document and it has only tenuous legal standing under the Merchant Shipping Act.'

While the government Intervention Powers are extensive, MAIB considers that 'with clarification and wider application' they could be used as a powerful tool to assist competent salvors in the expedition of complicated and controversial salvage incidents.

MAIB also states that commercial considerations should not be allowed to undermine the most expeditious actions to prevent or limit pollution. Indeed, it suggests that during a national marine emergency the MPCU should have considerable authority to intervene in commercial negotiation to acquire equipment quickly, either to support its own activities or to back up the activities of a commercial salvor. MAIB recognises that such an approach would have cost implications and that the Department of Transport (DTp)/MPCU would have to carry some, if not all, of the commercial risk.

MAIB believes these interim recommendations should be addressed by the Shipping Policy Directorate of the DTp, while the Merchant Shipping Bill is before Parliament (see *Petroleum Review*, December 1996).

Oil and gas industry prospects in South and Central America

The trend for privatisation and deregulation throughout South and Central America is expected to provide increasing opportunities for private oil and gas companies over the next four years, according to a recent report from Mackay Consultants.

Entitled *'Prospects for the Offshore Oil and Gas Industry in South and Central America, 1996-99'*, the study predicts that by 1999:

- Offshore oil production in the region will increase by 18 percent to reach 221.4 million tonnes. Output will continue to be dominated by Mexico (56 percent share), followed by Venezuela (23 percent) and Brazil (17 percent).
- Offshore gas output will almost double to 55.1 billion cubic metres. Once again, Mexico will be the largest individual producer with a share of just under 33 percent. One new offshore gas producer, Ecuador, is expected to come onstream in 1998.
- Total offshore expenditure, considered to be the 'best' single indicator of offshore activity, will rise by 28 percent to $13.8 billion. Three countries alone are expected to account for over 88 percent of such spending — Brazil (with a 38.6 percent share), Mexico (35.9 percent) and Venezuela (14.2 percent).

The growth in offshore gas production will be part of a wider trend in South and Central America towards higher gas consumption, states the report, particularly through electricity generation. New LNG plants in Venezuela and Trinidad and Tobago, the Cantarell project offshore Mexico and a massive extension of the onshore gas pipeline network will stimulate increased gas trade among the countries in the region.

Opportunities for deep water rigs and floating production systems are also predicted to gather pace following the 'notable' move into deeper waters in recent years. This is most evident offshore Brazil.

Ranger announces expansion plans

A strong balance sheet will allow Ranger Oil to expand its exploration and production programme, particularly in the United Kingdom where 'excellent returns on investment are being achieved', according to Chief Executive Officer Fred Dyment.

Some $83 million will be spent in the United Kingdom, of which $60 million will fund the development of new fields such as Columba B and E, Banff and Pierce as well as Ninian. Approximately $20 million will be spent on exploration, including key appraisal wells on Selkirk and Kyle and exploration drilling west of Shetland and in the Southern Gas Basin.

Meanwhile, over $50 million is to be invested in expanding Canadian operations, some $30 million of which will be devoted to a stepped-up exploration programme including wells in the Helmet areas of northeast British Columbia and in the Fort Liard area of the Northwest Territories.

A further $15 million is budgeted for the acquisition of new offshore leases and the drilling of three exploration wells in the Gulf of Mexico.

Saga to market gas to the over-50s

Saga Group, best known for its financial services and holidays for the over-50s, is planning to enter the UK domestic gas market.

The company plans to launch its new service in the south of England (Dorset, Avon, Sussex and Kent) early this year and will extend it throughout the United Kingdom when deregulation rolls out nationally in 1998.

As with all products in Saga's portfolio, customers will have to be aged 50 or over to take advantage of the cost savings it hopes to offer — exact details of which will not be known until a gas supplier has been chosen. However, the company states that it hopes to undercut British Gas prices by as much as 25 percent. This will represent a saving of some £100 per year on a typical bill, according to Saga.

The company was still in final negotiations with a small number of gas suppliers as *Petroleum Review* went to press. A final decision is expected shortly.

Saga expects that its 4 million customer database will provide it with a clear market advantage over newcomers starting from scratch.

Vanguard deals

Vanguard Petroleum has restructured the balance sheet of its Russian operating subsidiary, Magma Oil, by capitalising $22 million of debt and bringing in the Russian Bank Imperial as a 25 percent shareholder. The move will help Vanguard achieve its goal of doubling production at its Yuzhnoye oilfield to 6,000 barrels per day during the current year.

In a separate deal, Vanguard has acquired a 60 percent stake in Yoganneft, a Russian joint stock company whose other shareholders are Kogalymneftegaz, Megionneftegazgeologiya and Lukoil. Yoganneft has a 50 percent free carried interest in Yoganoil which is operator of the South Vat-Yoganskoye producing oilfield in Western Siberia with 35 million barrels of proven plus probable oil reserves. The other 50 percent is held by Dana Petroleum.

Vanguard has also acquired a 12.5 percent interest in the newly established joint stock company Uvatneft, which has licensing rights over another seven proven oilfields in Western Siberia with estimated reserves of some 6.5 billion barrels.

The company is also increasing its stake in the Siberian Oil Corporation from 33.3 to 40 percent.

Guidelines for the Investigation of the Microbial Content of Fuel Boiling below 390°C and Associated Water

In 1987 an IP Fuels Task Force was convened to consider the implications of an upsurge in operational problems caused by microbiological contamination of distillate fuel. A relevant Code of Practice (IP 385/88) was published and enough seemed to have been done to contain the problem. Unfortunately, events proved otherwise, partly because of an increase of fuel imports into Europe from suspect sources. What had been considered an end-user problem became a problem which extended throughout the supply chain. In some cases contamination was so heavy that it overwhelmed the IP recommended test protocols.

In 1993 a Microbiology Fuels Group was re-convened with a remit to produce improved test methods, guidelines for sampling, sample handling and testing and to advise on anti-microbial strategies and levels of contamination. The group was actively and comprehensively supported and drew membership from several European countries.

The first task was accomplished when the new test methods were published as IP 385/95. The test protocols are already widely accepted as reference methods. The second part of the remit has now been achieved with the publication of the Guidelines. Investigators can now have confidence that their sampling techniques and programmes are appropriate and that the samples will be tested by agreed and reproducible procedures.

Although a few attempts have been made to introduce numerical microbiological limit values, the lack of uniform sampling and testing methods has given them little credence. It now becomes possible for different investigators to compare results and to develop clear concepts for norms, warning levels and action levels. However, the Fuels Group does not favour rigid numerical limit values. All microbiological tests lack precision and any 'fitness for purpose' limit values should recognise this. It was apparent in the discussions that what was an acceptable quality for fuel delivered for one use would not be an acceptable quality for fuel further up the distribution chain or delivered for a different use. The many factors in assessing risk for various fuel usages are addressed in the Guidelines.

The principles of anti-microbial strategies are described but it is recognised that each situation could call for an individual solution depending on the severity of the risk, environmental constraints and the equipment, chemicals and time available.

Annexes to the Guidelines contain the new IP 385/95 test procedures, a review of available on-site test kits, sampling proforma and a bibliography.

This eagerly awaited IP publication will provide an authoritative document of great value to fuel producers, distributors and end-users.

E C Hill, Chairman,
IP Microbiology Fuels Group

An overview of the development of fuel retailing in Central Europe

By Stephen Brooks
Principal Consultant
Marketing & Distribution,
Wood Mackenzie
Consultants Ltd

Central Europe's fuel retailing sector has undergone a remarkable transformation in recent years and is now being hailed as a 'land of opportunity' for foreign investors as the economy picks up, car ownership increases and, hence, the demand for fuel rises. However, foreign companies need to tread cautiously and will require patience and long-term commitment if they wish to secure a firm foothold in this developing market-place.

While the region has indeed returned to economic growth, inflation is being brought under control and various privatisation, upgrading and modernisation programmes have been embarked on in recent years, a number of problems remain, including a substantial lack of communications and transport infrastructure, a poor legal framework and corruption at various levels.

Meanwhile, the continuing presence of product import tariffs (albeit at lower levels than in the past) and, in some countries, end-user price controls, have severely constrained retail marketing profitability in many parts of the region, especially for those western based oil companies seeking to develop retail marketing operations.

The statistics, however, do look inviting. Substantial growth in car ownership is forecast over the next 10 years — a 60 percent increase predicted in Estonia and Latvia and over 40 percent in most other countries in the region defined here as Poland, the Czech Republic, Slovakia, Hungary and the Baltic states. This, in turn, is expected to boost demand for fuel by some 50 percent in the same period from 19 billion litres per annum to 28.6 billion litres per annum.

Poland is predicted to remain by far the largest market in the region with demand at 14 billion litres per year by 2005, up some 4.5 billion litres on 1995 figures, while the Czech Republic represents the second largest market, 5 billion litres annually by 2005 (compared with 3.3 billion litres in 1995).

The service station infrastructure in the region at present remains underdeveloped. The density of outlets per square kilometre of land area is very low in all countries, especially when compared with the mature markets of the United Kingdom and Germany. However, one reason for this is the low level of car ownership — the number of outlets per 1,000 cars in circulation is actually quite high in many countries.

This reflects the fact that the region as a whole is still characterised by a large number of elderly, small fuel outlets unsuited to the needs of increasingly consumer-oriented societies. Fragmentation of ownership and operation of service stations is commonplace with many of the sites run by small, independent entrepreneurs who were encouraged to enter the sector by the market liberalisation measures at the beginning of the decade.

The rebuilding and development of economic and transport infrastructure in the region has meant that many of the traditional fuel outlets have been found to be in the 'wrong' location which, in itself, has provided many opportunities for new investment. As against this, many of the modern retail site developments have been centred on high-volume, urban locations such as Budapest and Prague. These sites have mostly been built to western standards with modern forecourt layouts, environmental protection measures, and ancillary services such as car wash and shop — contrasting sharply with the old style, traditional outlets.

There is increasing competition for new, prime site locations in such cities and some favourable regions are now already approaching saturation. As a result, the cost of land has often risen to levels which look unrealistic. Investors are also often hampered by long delays as planning approval is subject to a plethora of bureaucratic procedures.

The potential for development nevertheless remains high across the region as a whole. But while many new service stations will be built over the next decade, absolute growth of the retail network in many countries will be balanced by the closure of many of the smaller, out-of-date outlets. Furthermore, as the number of modern service stations increases, the high average throughput figures currently achieved at such outlets (in many cases of around 5 million litres per year) are expected to decline.

Foreign Brand Service Stations at mid-1996

	Estonia	Latvia	Lithuania	Poland	Czech Republic	Slovakia	Hungary
Agip	-	-	-	4	28	1	22
Aral	-	-	-	7	32	-	35
Avanti	-	-	-	-	-	10	65
BP	-	-	-	2	8	-	18
DEA	-	-	-	3	5	-	-
Esso	-	-	-	6	18	2	13
Jet	-	-	-	14	25	-	18
Lukoil	-	3	15	-	-	-	-
Neste	21	11	16	14	-	-	-
OMV	-	-	-	-	27	22	66
Shell	4	5	10	21	36	10	100
Statoil	11	10	10	25	-	-	-
Tamoil	-	-	-	-	14	3	9
Texaco	2	1	1	-	-	-	-
Total	-	-	-	-	14	-	30
All	38	30	52	96	207	48	346
% of Network	6	5	8	2	14	11	22

Source: Wood Mackenzie

Regional analysis

Each of the countries in Central Europe, not unsurprisingly, varies in terms of size, culture and socio-economic patterns. As a result, levels of fuel demand vary considerably. The following paragraphs summarise the main structural characteristics of each country's fuel retailing sector.

The Baltic states

An estimated 600 million litres of fuel were sold through the fuels retailing sector in Estonia in 1995. While there is no state control on prices, a new product import/export licensing system was introduced in July 1996 in a bid to reduce the hold that the black market has on trade. Licences are now issued only to those companies with a minimum of 7.5 million kroons equity in place (approximately $415,000).

The service station network is highly diverse and fragmented, with former state-backed distributor Esoil (EK), local independent Alexela, Neste and Statoil sharing the bulk of the business. A large proportion of the market is held by small independents, often with only a single outlet. Shell and the Texaco/Hydro joint venture are looking to develop networks.

Latvia, meanwhile, sold some 700 million litres of fuel in 1995 through its network of 600 retail sites. As in Estonia, there are no price controls but the market remains heavily regulated, particularly its licensing system, again with the aim of reducing black market trade. Once again, the retail sector is highly fragmented with some 300 different companies licensed to sell oil products. The major players are national distributor Latvijas Nafta, which holds 10 percent of the market with 30 to 40 outlets and three oil depots, Neste and Statoil.

The highest demand for fuel in the Baltic states in 1995 was in Lithuania — approximately 800 million litres of fuel through a network of some 650 outlets. Licences are required for each stage of the downstream sector, including retail, but prices are not controlled. There remains a substantial black market economy — accounting for some 35 percent of demand and not recorded in official figures.

The only one of the Baltic states with its own main fuels refinery, owned and operated by state-owned Mazeikiu Nafta, sister company Lietuvos Kuras (Lithuanian Fuel) dominates the distribution infrastructure with 18 rail-fed distribution terminals, its own fleet of delivery trucks and 120 service stations. Neste, Statoil, Shell, Texaco/Hydro and Lukoil are currently establishing retail networks but the majority of outlets are in the hands of small independents.

Poland

With a population of some 39 million, Poland has the largest fuel demand of any of the Central European countries. It sold an estimated 9.5 billion litres of fuel through its 4,700 plus fuel outlets in 1995, a figure expected to rise to 14 billion litres per annum over the next decade. Over 2,600 of these sites are small, independent outlets, often located in rural communities and operated

by agricultural co-operatives or small, commercial entrepreneurs.

The market is heavily regulated and pricing and import controls (15 percent import tariff on gasoline and 25 percent on diesel) remain in force, considerably constraining distribution margins and retail profitability. However, it is thought that price controls will be relaxed in the near future.

State fuels distributor Centrala Produktow Naftowych Pans (CPN) dominates the retail sector and controls much of the distribution infrastructure. Most western oil companies are developing fledgeling retail networks, while the country's two major oil refineries of Plock and Gdansk have integrated downwards into fuels retailing with their own branded service stations.

The Czech Republic

The Czech Republic's 1,300 service stations sold an estimated 3.3. billion litres of fuel in 1995. The transition from a state-regulated sector to a free market, (with the deregulation of prices in 1994 and more recently the partial privatisation of the downstream sector) coupled with fast growth in fuel demand, has encouraged significant investment by foreign-based oil companies in developing modern style retail networks. Shell, Agip, Aral, Jet, OMV and Total are all developing a major retail marketing presence. Import tariffs at 7 percent on gasoline and 8 percent on diesel remain in place but are expected to be removed in 1997.

Former state distribution company Benzina was broken up in 1994 into three separate entities — Cepro as, a joint stock company controlling the distribution infrastructure, and retailers Benzina as (a joint stock company with 280 of the best fuel retail sites) and state-owned and operated Benzina sp (with the remaining 234 sites, of which many were leased or sold to foreign oil companies).

The two major former state-run oil refineries have also developed their own fuel retailing networks over the last few years, although their future in the light of the partial privatisation of the Czech oil refining sector in 1996 and the role of three existing retail players in this — Agip, Conoco and Shell — remains to be seen.

Slovakia

Approximately 1.1 billion litres of fuel was sold through Slovakia's more than 400 service stations in 1995. A 6-8 percent import tariff remains in place and, unlike the Czech Republic, a degree of state end-use price control is still in force.

Former state-owned distribution company Benzinol is the major retailer with around 200 sites, while national refiner Slovnaft, now partially privatised, has its own retail network of some 100 sites. Slovnaft acquired a 51 percent interest in Benzinol in 1995.

Foreign oil company activity to date has been less than in the neighbouring states of Poland, Hungary and the Czech Republic but both OMV and Shell have established their own retail networks in the country.

Hungary

Hungary has the third largest demand for retail market fuels of the countries considered. Over 2.7 billion litres of gasoline and diesel was sold through some 1,500 outlets in 1995. It is the most deregulated and 'westernised' of the central European countries. There is no state control on end-user prices and although import tariffs were removed completely, an 8 percent tariff was re-introduced as a temporary expedient in April 1995 aimed at reducing imports. Former state-owned refiner MOL still dominates the entire wholesale, distribution and retail marketing sector with some 300 service stations.

The bulk of the Hungarian service station network is in the hands of small, independent entrepreneurs but many of these sites are expected to close as the sector is modernised.

There is already a significant and developing foreign oil company presence — Shell, Aral and OMV are notable players — although there have been some signs of industry consolidation, notably the 1996 sale of the Q8 network of 31 service stations to OMV.

Investment plans — the national players

Various strategies are being adopted by the national players in Central Europe in order to both defend and build upon their current positions in their respective markets and to target opportunities outside national borders. **MOL** for example, has developed 'MOL 2000', a retail investment programme aimed at 'vigorously defending' its domestic market leadership in Hungary. The company is also expanding into neighbouring states, except Austria, with 100 new service stations planned by the year 2000. The first of these opened in Romania in September 1995.

Benzina as, too, intends to defend its position as the leading player in the Czech market. With many of its poorer sites having been hived off to Benzina sp in 1994, it is undertaking a modernisation programme and plans an increase in network size from 280 to 330 outlets by the year 2000.

Meanwhile, uncertainty over the privatisation process has left the future strategy of Poland's **CPN** somewhat unclear. Current plans are thought to include network rationalisation, upgrading and modernisation of existing sites in prime locations, as well as a new build programme on new motorways.

Unfortunately for **Slovnaft**, future growth of its domestic service station network in the Slovak Republic has been barred by the Slovak anti-monopoly office which wants the company's market share reduced to 50 percent by the year 2000. Slovnaft currently holds significantly more than this with a total of 300 outlets following its acquisition of the majority (51 percent) interest of national fuels retailer Benzinol in 1995. The continuing development of foreign oil com-pany networks should mean that Slovnaft's market share is reduced as required; otherwise it will be forced to divest part of its network.

The company's growth ambitions in the fuel retailing sector have therefore now moved abroad. It has already established embryonic networks in the

It has no wheels, no engine, and came out in 1905

So what's it doing in the Motor Industry?

In 1905, whilst the newly born British motor industry was coming to grips with combustion engines and transmission systems, BEN was already giving practical help to people in the motor and cycle industries.

Today BEN helps thousands of men, women and children in their own homes as well as disabled or retired people in its four residential and nursing centres.

If you would like to know more about BEN or make a donation please call 01344 20191.

Ben

BRITISH MOTOR 1896 1996 CENTENARY

BEN — MOTOR AND ALLIED TRADES BENEVOLENT FUND

Lynwood • Sunninghill • Ascot • Berkshire SL5 0AJ

Registered Charity No: 297877

Ukraine and the Czech Republic where it plans 25 service stations and a 30 percent market share in the Moravian region.

Meanwhile, in the Baltic states, **Esoil, Latvijas Nafta** and **Lithuanian Fuel** were believed to be discussing some form of strategic alliance covering service station development, especially along the new north-south highway that is being constructed linking the countries.

Foreign investment interests

As indicated earlier, many western oil companies have already embarked on establishing their brands in Central Europe, concentrating primarily on the Czech Republic and Hungary because they are the most deregulated of the markets. However, recent interest has focused on Poland whose fuel retail market is almost as big as that in the Baltic states, the Czech Republic, Hungary and Slovakia put together.

Shell is the only foreign company to date to be investing in every Central European country. It is well established in Hungary where it is the clear number two in the fuel retail market with a 20 percent share. A $100 million five-year investment programme began in 1995 and is aimed at expanding its network from 100 to 150 outlets in order to protect its share position in the country.

The company has also become one of the major refiners in the Czech Republic through its participation in the International Oil Company (IOC) consortium. It intends to become one of the retail market leaders with a targeted share of 15 percent. Shell also intends to use this as a supply base to build a similar 15 percent share of the Slovakian market.

Shell is also investing heavily in Poland and in the Baltic states where **Statoil** and **Neste** have focused their Central Europe retail marketing expansion. Both companies are investing in new product storage and import terminals at Riga in Latvia which they will use to supply their expanding marketing operations in the Baltics. Meanwhile, they are both more advanced than most others in establishing retail activities in Poland.

AgipPetroli's main focus to date has been on the Czech Republic where, as part of the IOC consortium, it has become a major player in the refining sector. It plans to more than double the size of its service station network to 67 outlets by the year 2000, with a 10 percent market share objective. AgipPetroli also has significant investment plans in Poland, Slovakia and Hungary.

Aral has focused its attentions on Hungary, the Czech Republic and Poland — in all of which it is aiming for a market share of 5-10 percent. It has also targeted Slovakia on a smaller scale.

British Petroleum has announced a $500-600 million investment programme in eastern Europe over the next five years, up to half of which will be aimed at Poland where it plans 120 outlets and a target 15 percent market share in the south of the country by the end of the decade.

The company also plans to build up its presence in both the Czech Republic and Hungary.

Following its acquisition of a share in Czech refining through the IOC consortium, **Conoco** is planning to continue expanding its service station network and has targeted an increase in market share from 3 to 10 percent.

It also plans to develop existing networks in Hungary and Poland and to start up in Slovakia.

Exxon, too, has focused its investment plans on the Czech Republic, Hungary, Poland and Slovakia. Meanwhile, **OMV** is seeking to build its fuel retailing presence in those markets neighbouring Austria.

Following its decision to pull out of the IOC consortium in the Czech Republic, **Total** has become more selective in its investment plans. The scale of further expansion of its existing retail networks in the Czech Republic and Hungary are uncertain.

Texaco has announced that it plans to spend some $150 million on the construction of 100 service stations in Poland over the next five to six years. It has also targeted the Baltic states via the Texaco/Hydro joint venture. Despite all these expansion plans there are already hints that a degree of industry consolidation may not be far away as some companies are unable to obtain critical mass. Already, Kuwait Petroleum has withdrawn from Hungary, while Amoco has cancelled its ambitious retail development plans in the region.

Amoco has cancelled its ambitious retail development plans in Central Europe

The road ahead

Substantial growth in retail fuel demand in Central Europe of approximately 5 percent per annum is forecast — driven by increases in income per capita and car ownership. This will provide continued investment opportunities for western companies. However, the ongoing industry privatisation process will influence the future structure of the retail fuel sector, especially access of foreign companies to the former state-owned national networks.

The state of play in the privatisation process can be summarised as follows:

Poland Privatisation of the Polish downstream sector is pending. Strategic investors are to be invited to take a stake in the refineries through which they will gain a percentage ownership of the CPN retail network. Potentially, this means that the CPN network will be apportioned out to a variety of different players and accordingly could well be broken up as a unified operation. Not surprisingly, CPN is fighting to remain independent of the refineries and is known to have drawn up its own, alternative, privatisation plans.

Czech Republic Although the two main refineries of Litvinov and Kralupy have been partially privatised, the new state holding company, Unipetrol, holds a majority 51 percent share in the refineries plus a 90 percent stake in Benzina as. The remaining 10 percent is held by the two smaller refineries of Paramo and Koramo. At present it seems that the government will retain its 60 percent holding in Unipetrol, thus maintaining its control of Benzina for at least the next five years.

Benzina sp, which operates the rump of the old unified Benzina network, was scheduled for privatisation but now seems likely to remain under state control for now.

Slovakia Slovnaft is already partially privatised but has not pursued the foreign oil company 'strategic investor' route like the Czech refineries.

Hungary The privatisation of MOL began in June 1993 with the first allocation of shares (just 1 percent) offered to the public. An additional 7 percent was offered to local municipalities. Further local equity and international offerings have since been made and today the state holds a 58.6 percent stake through holding company APV Rt plus one 'golden share', while foreign shareholders have a 28.7 percent interest, employees 4.9 percent, domestic citizens 5.3 percent and local councils 1.7 percent.

The Baltic states Esoil in Estonia has already been sold to a consortium including Coastal Corporation. Meanwhile, Latvijas Nafta in Latvia has already been largely broken up and the rump of the company is now set to be privatised. State participation in the Lithuanian oil sector looks set to reduce through increased foreign participation. Lukoil in particular is taking an increasingly active role in the refinery.

This article is based on a paper presented at a joint IP/UK Department of Trade and Industry conference held in London last November.

Publications

The North Sea Abandonment Handbook

Editor: Nick Terdre (TCS Partnership, Room F2, Kingsgate Business Centre, 12/50 Kingsgate Road, Kingston-on-Thames, Surrey KT2 5AA) 879 pages. ISSN 13163 478X. Price: £545 (spiral-bound).

This publication provides a background to the North Sea abandonment market, containing detailed descriptions of each field installation, the likely date of cessation of production and an analysis of abandonment options and costs. In the 316 fields developed or approved for development around the North Sea, there are a total of 441 offshore structures, of which the great majority, 401, are fixed platforms with steel jackets. No less than 97 of these weigh more than 4,000 tonnes and 106 are installed in water depths in excess of 55 metres — these are the platforms which, according to the International Maritime Organisation (IMO) guidelines accepted by all North Sea countries, do not have to be entirely removed. The handbook indicates that if all offshore installations in the North Sea were entirely removed, the cost would be an estimated $15.35 billion in 1996 prices; the bill for topside removal would be $13.74 billion and that for topside removal plus jacket toppling in-situ $13.49 billion. The book also contains a 30-page section describing the current regulatory regime.

Gas Oils (Diesel Fuels/Heating Oils)

(CONCAWE, Madou Plaza 24th Floor, Madouplein 1, B-1210 Brussels, Belgium) 61 pages (paperback).

This report collates the physical and chemical and toxicological, health, safety and environmental data on gas oils, including diesel fuels and heating oils. Together with kerosenes, the gas oils constitute a category of petroleum products commonly known as middle distillates.

Suspensions: Fundamentals and Applications in the Petroleum Industry

Editor: Laurier L Schramm (American Chemical Society, Washington, DC 20036-4899, USA) 800 pages. ISBN 0 8412 3136 2. Price: US$134.95.

This volume, part of the American Chemical Society's Advances in Chemistry Series, provides an introduction to the nature, formation and occurrence, stability, propagation and uses of suspensions in the petroleum industry. Aimed at scientists and engineers who may encounter or apply suspensions, whether in process design, petroleum production, or research and development, it focuses primarily on the applications of the principles of particle dispersions with attention given to practical processes and problems. The book illustrates how to understand, make and use desirable suspensions and how to approach destabilising or preventing the occurrence of undesirable suspensions.

Oil Tankers & Pollution Laws

Léonie J Archer (Oxford Institute for Energy Studies, 57 Woodstock Road, Oxford OX2 6FA) 73 pages. ISBN O948061 91X. Price: £20 (paperback).

This study examines the passage and enactment of the US Oil Pollution Act of 1990, many of whose provisions are only just entering into force now. It considers the impact of the new legislation on ship and cargo owners and the movement of oil in US waters and mainland ports. Comparing maritime legislation over the same period within the European Union, the report concludes with a brief survey — in the context of growing global environmentalism and the impetus of the OPA — of anti-pollution initiatives being pursued in the rest of the world.

1996 Petroleum Industry Review

(Price Waterhouse World Energy Group, 1201 Louisiana, Suite 2900, Houston, TX 77002-5678, USA) 57 pages (paperback).

The US oil majors are becoming increasingly involved in power generation and collaboration, including joint ventures and marketing alliances, in a bid to meet the burgeoning demand for electricity around the world and to take advantage of new opportunities to monetise their natural gas assets, according to this new report which surveys the significant accounting practices by 30 leading US oil and gas companies. New sections in the report include sample disclosures of risk management activity and of foreign registrants, ie non-US petroleum companies with US operating interests.

Application of Powertrain and Fuel Technologies to Meet Emissions Standards

(Mechanical Engineering Publications Limited, Northgate Avenue, Bury St Edmunds, Suffolk IP32 6BW) 370 pages. ISBN 0 85298 996 2. Price: £98 (plus 10 percent for delivery to customers outside the United Kingdom).

Sustained market pressures and ever tightening environmental legislation controlling vehicle and engine emissions require engine and vehicle engineers, component and system engineers, legislators and those involved in the petroleum industry to keep abreast of current research and developments. This text is a compilation of 25 papers presented at the Institute of Mechanical Engineers' international seminar on the 'Application of Powertrain and Fuel Technologies to Meet Emissions Standards' held on 24-26 June 1996. Topics covered include engine design, diesel control technology, lubricity of diesel fuel injection equipment, new generation fuels and hydrocarbon emissions from spark ignition engines.

Government Subsidies and Demand for Petroleum Products in Iran

Djavad Salehi-Isfahani (Oxford Institute for Energy Studies, 57 Woodstock Road, Oxford OX2 6FA) 30 pages. ISBN 0 948061 95 2. Price: £20 (paperback).

Like many other oil exporting countries, Iran subsidises domestic consumption of refined products. This paper describes the market for such products in Iran and estimates demand functions for the four main refined petroleum products. Particular attention is paid to the kerosene market where price subsidy is the largest, and where rationing in the 1980s requires taking into account the working of the black market.

The Great Alliance: A History of O.I.L. Limited

Rodger MacDonald (O.I.L. Limited, Cleary Court, Church Street East, Woking, Surrey GU21 1HJ) 70 pages. Price: £9.95.

Ocean Inchcape Limited (O.I.L.), a joint venture between shipping companies Ocean Transport & Trading and the Inchcape Group, was established 25 years ago and is now one of the largest companies of its kind in the world. This year-by-year account charts the company's evolution from a fleet of eight vessels to one of more than 100 with over 1,300 employees in the United Kingdom, West Africa, the Middle East, South America and the Asia Pacific. Touching on the development and the politics of the oil industry over the past quarter century, the book covers the company's disappointments and successes and paints an interesting picture of shipping before it was transformed by the container revolution.

Big Oil and Big Mac join forces in Central Europe

McDonald's has 19,500 restaurants in 96 countries around the world, of which 5-6 percent are based at or near service stations. The company moved into Central and Eastern Europe some five years ago, opening its first restaurant in Moscow in 1990. More recently, however, it has become involved in the joint development of sites with oil companies in a mutual bid to benefit from economies of scale and joint services in order to heighten brand awareness in a market that has only been opened up to western business and culture over the past few years.

Some years ago, oil companies, eager to boost alternative business, went into convenience stores and later into hot food and snacks. It then appeared that there was a definite synergy with the quick-service operations of McDonald's, particularly since the two businesses had similar customer bases, and both had strong brand names, known worldwide. Both businesses were searching for cost savings in order to improve returns.

For the petrol retailers one of the attractions of a joint operation was the large number of customers wanting to buy McDonald's fast food — and who hopefully would buy petrol at the same time.

Four-step strategy

Based on past experience, McDonald's has developed a four-stage hierarchy for the development of its business structure in new markets. Stage one centres on an in-store leverage of the McDonald's brand from within a well-known domestic company, usually based in a city centre. Once the branding has become sufficiently established within a region, the next phase is the development of free-standing stores.

Stage three involves the co-development of businesses. In the past, there has been a noticeable 'casual' pattern of co-development between McDonald's and the oil companies as both were often targeting similar 'prime' sites with high population and traffic flow. However, the company is now following a more structured plan of co-development with the two sets of businesses proactively selecting properties on which to construct their outlets. Such an approach allows them to reduce building, operating, service and maintenance costs by sharing parking areas, entrances and signage. It also provides the two operations an opportunity to introduce their brand to one another's customers.

The final stage in the development hierarchy — co-branding — involves the development of the two businesses under one roof, not as two separate entities on one property as in the co-development option. It provides both McDonald's and the oil companies with additional cost savings to those outlined above, as the initial investment required for site construction, developing access and entrances, sewage, water, and electricity is shared. Furthermore, application for building permits are often simplified and processed more quickly than when a sole service station is being considered as the local authorities see the joint development as beneficial to the region, bringing in money and providing many jobs and a valuable collection of services to the community.

It is important to point out that the co-branding development phase is only embarked on if the two companies' brands are perceived as being strongly embedded in the customer's mind.

Early efforts in co-branding involved a normal service station with a McDonald's module/kiosk attached alongside. However, visibility was not always good, the petrol station customer often not realising that a McDonald's restaurant was on the site. Nowadays more modern designs have ensured better visibility from all angles. Great care is taken over site design with a common entrance provided on both sides of the building to provide access for both drivers and pedestrians and traffic flow is kept as logical and intuitive as possible.

While the co-development option discussed earlier is relatively quick and requires little effort from both companies, the co-branding strategy takes a long-term view, requiring more effort and flexibility on both sides.

Pattern to date

As already mentioned, McDonald's opened its first restaurant in the Central and Eastern European marketplace in Moscow in 1990. It now has a total network of some 300 restaurants covering every Central European country, including Albania, with Poland representing its biggest market in this region to date. The company plans to expand its current Polish network of 65 restaurants to some 100 sites by the end of 1997 and has already begun to collaborate with various oil companies.

Most attention to date has focused on urban developments and many opportunities remain in the more rural areas. Belarus and the Ukraine are two Eastern European countries that have yet to be tapped.

Forecasting positive results from joint operations for all concerned, Helmut Hecher, Vice-President, McDonald's Development Co, stressed that 'McDonald's adds excitement to the distress purchase of gasoline'.

This article is based on a paper presented by Michael Biggins, Oil Team Director, McDonald's Corporation, and Helmut Hecher, Vice President, McDonald's Development Company, Central Europe, at a joint Institute of Petroleum/UK Department of Trade and Industry conference held in London last November.

IP THE INSTITUTE OF PETROLEUM

Midland Branch

'Annual Joint IP/BLF Dinner Dance'

Friday 17 January at St John's Hotel, Solihull

Raffle, including a major prize kindly donated by Gulf Oil GB Ltd. Ticket prices are £33 per person (£30 per person for bookings with a cheque received before 31/12/96). Additionally, for groups booking a table of 10 people we will supply one ticket free of charge.

Reception is at 7.30 pm for 8.15 pm. Black Tie. Coaches 1.30 am Special room rates have been arranged with the hotel. Please contact the hotel direct and quote Midlands Branch BLF

For the full booking form please contact:

David Johnson (c/o Houghton Vaughan)
Tel: 0121 369 6100 Fax: 0121 359 2458 *or*

Mike Ward (c/o Mike Ward Associates)
Tel: 01299 896654 Fax: 01299 896955

IP student prize winners

Angela Smith studied for her first degree at the University of Otago, New Zealand, and then 10 years later was awarded an MSc degree with distinction for Petroleum Geoscience at the Imperial College of Science, Technology & Medicine. She is currently working as a geologist at the Cambridge Arctic Shelf Programme.

Another prizewinner, Stephen York, achieved an overall passmark of over 80 percent with distinction on the 1995/96 MEng course in Petroleum Engineering at Heriot-Watt University, previously graduating from Cambridge University in Production Engineering. He is now working for BP as a petroleum engineer on their Challenge Graduate programme.

Virginia Collyer gained an MEng degree with distinction from Heriot-Watt University and was also a Cambridge graduate. She received her prize after returning from an assignment to Houston on behalf of her employers, ERC Tigress.

Network planning: lessons from a Budapest case study

Market modelling was used in two recent case studies to analyse the potential retail petrol market in Budapest. The elements involved in network planning are market strategy, site selection and evaluation, real estate purchase, site design, construction and operation. This article concentrates on site selection and evaluation. MPSI has developed a complex model which takes into account the variables in each market — location, traffic, facilities, brand, price, merchandising and other factors affecting the individual market. These factors, together with carefully calculated estimates of likely volumes (Figure 1), are then evaluated in order to pinpoint suitable sites for purchase and development as service stations. Thus, the model allocates potential demand to potential outlets.

By Ian Wakefield
MPSI Systems Ltd

Geographic Information Systems also provide valuable tools for network planning and the MPSI Capital Planning System incorporates this and uses it extensively together with its own volume prediction capability. In the case of Budapest, Infograph supplied the digital mapping and much of the demographic demand data used in the 1996 study.

The study of Budapest should really be titled 'Greater Budapest', as it incorporates several outlying suburbs in addition to the 22 districts in the City of Budapest. In 1990 there were 82 outlets open for business. These were nearly all under the Afor brand (which later was reformed into MOL) but there were also a significant number of Shell outlets. The other brands emerging at that time were Agip, BP and Aral.

By April 1996 the supply position had become far more crowded, with at least 10 more brands and 194 outlets, and a further 20 under construction.

Supply had therefore nearly tripled but what about demand?

The perceived wisdom was (and is) that demand will increase because the economy of Hungary and other emerging markets contains low GDP per capita figures which will grow. Therefore car numbers and petrol demand will increase. Against this generalised macro view, there have unfortunately been some dampening factors on petrol demand at work, particularly in this market:

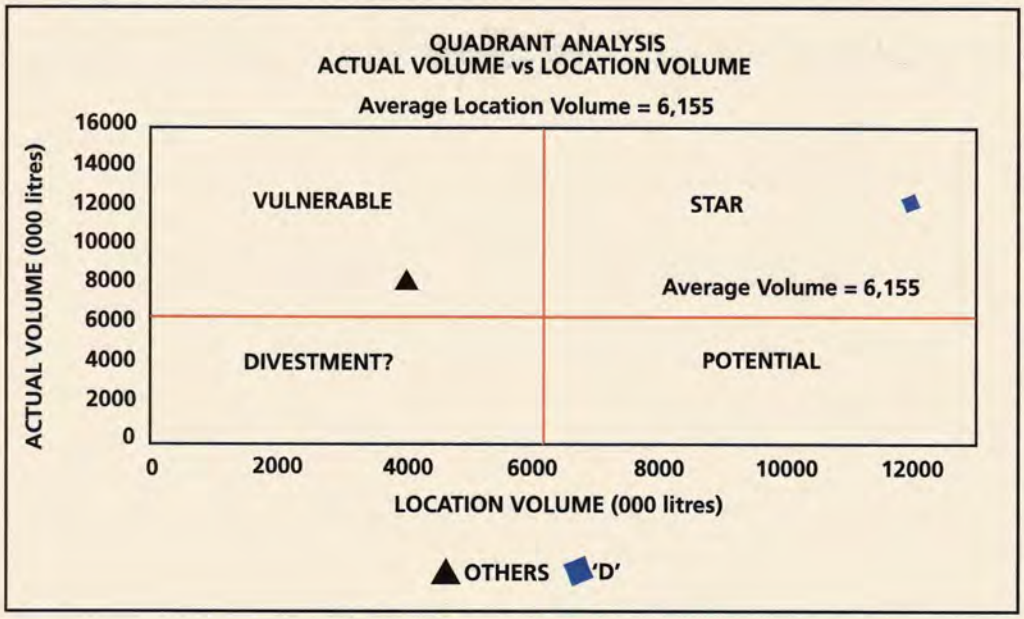
- More fuel efficient car parc
- Competitive public transport system (in cities)
- Rising fuel taxes and hence prices
- Increasing traffic congestion

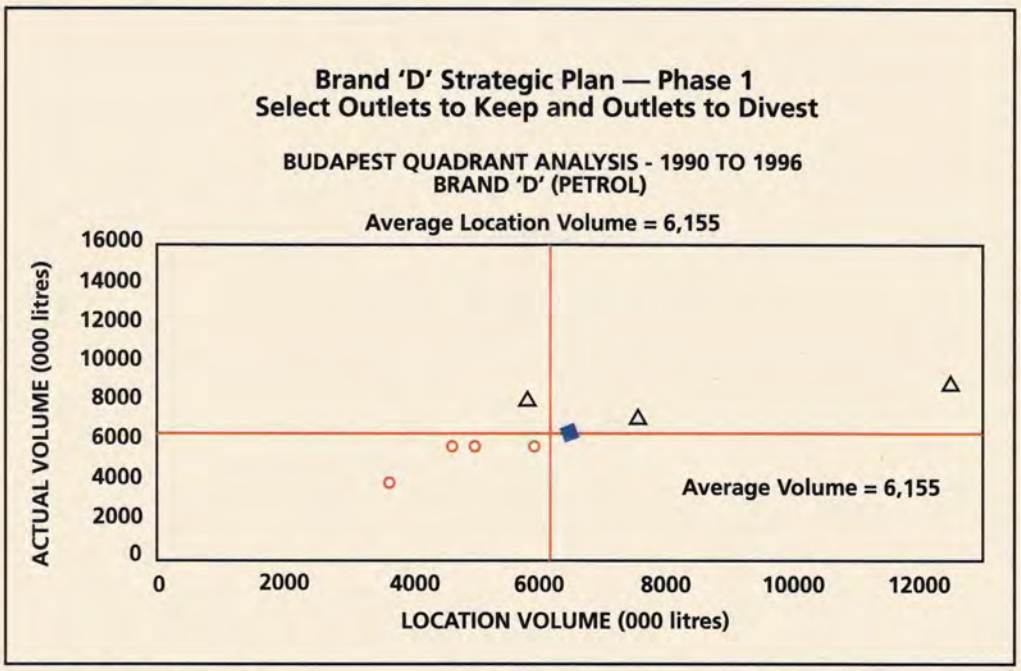
The consequence of this static demand has been a dramatic drop in average volumes and this is why Budapest makes an interesting case study as still more companies plan to invest **(Table 1)**.

Greater Budapest	1990	1996
Households	912,000	972,000
Cars	393,000	603,000
Price 95 unleaded HUF/ltr	28.0	121.9
Petrol demand (mn litres)	505	513
Open sites	82	194
Average annual petrol volume kilolitres	6,155	2,645

Table 1

Figures 1 (top) and 2 (bottom)





Budapest case study

Our subject Brand 'D' faced the conflicting problems of increasing competition and static demand, while the company network objectives demanded increased market share, maintained average volumes and increased market effectiveness.

The solution was to develop a 'sound' network plan:

- Improve existing 'good ' sites
- Build new greenfield sites
- Get rid of existing 'bad ' sites

Starting with a network of seven outlets, only three were selected as suitable for keeping (the black triangles), the remaining four were selected for divestment (the red circles) — see **Figure 2**.

Figure 3 shows how the retained sites have fared. The hollow triangles represent the position in 1990, while the solid triangles show the position in 1996. Because of the saturating market, the whole trend is to move from top right to bottom left and it is that which the strategy seeks to resist. Also shown is what happened to the divested sites — hollow circles show the position in 1990 and the solid circles refer to 1996. In addition nine new locations were selected for redevelopment. This was done with the aid of the market model to select strong locations that would be robust defenders of volume against present and future competition and could maximise benefits from proposed demand changes. These are shown as solid squares.

Figure 4 shows the final position for brand 'D' in 1996, showing now the 1996 market average volumes for comparison. As hoped, most of the brand "D" sites are in the upper quadrants.

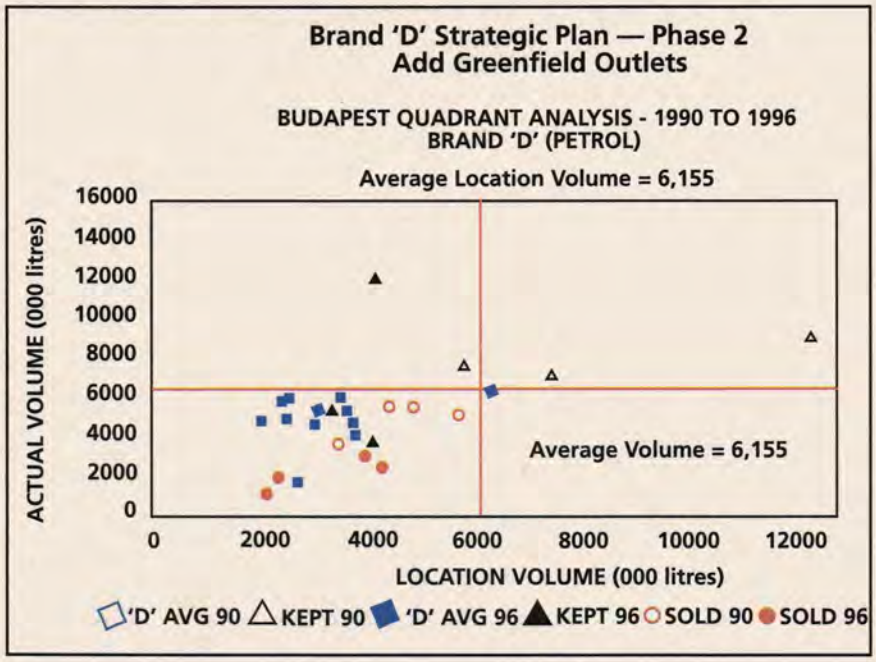
The effect on the 'success' of the brand 'D' network is shown in the **Table 2**.

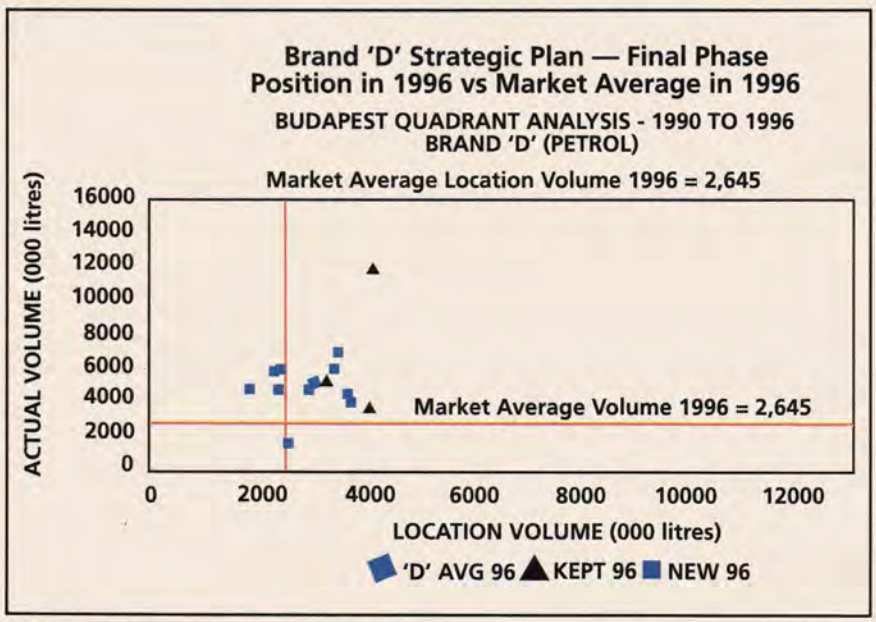
Market share has risen by half as much again, whilst market effectiveness has doubled to twice the market average and the best in the market.

The future in Budapest

More retail outlets are likely to be built — several dozen are in the pipeline.

Figures 3 (top) and 4 (bottom)





MPSI's Market Model indicates that there are still some promising locations left. It is not too late if you know how and where to look! However, some existing players expect to complete their work in this market within the next two years. Some rationalisation is necessary and indeed this has now begun with the sale of the Q8 network to OMV announced recently. The future focus could shift to investment outside Budapest, as there are many untapped opportunities in the secondary cities and towns.

Rosy Central European future ...

Service stations are one of the icons of western economies, with their brightly lit forecourts, convenience shops, 24-hour opening and promise of quality. They rank alongside McDonald's restaurants, Coca Cola, western cars, Este Lauder perfume shops, GSM mobile phones, Marriott hotels and so on. They offer freedom of movement and provide choice for the motoring consumer in a way which firmly underscores the transition from the old style command economies of eastern Europe.

Western Europe is said to be saturated with petrol stations. Central and Eastern Europe offers fresh opportunities to companies wanting to expand their markets. Fresh alliances will form. Western companies have already combined — for example, Mobil and BP in Europe, Texaco and Shell in America, and Gulf, Elf and Murco in the United Kingdom. Maybe we will see the national companies in Central Europe combining in more joint ventures inside and outside their own borders, perhaps with western companies, or their sibling national companies.

... but

Why have some companies, most recently Amoco in Poland, already 'folded their tents'?

It is also necessary to point out that the numbers of new sites should be put into context — they amount to a few hundred a year at most, rather than thousands, as once predicted. Most of the potential for new equipment suppliers will be where environmental remediation of existing sites requires a major rehabilitation.

The 45-year pause after 1945 should be set against 1,100 years of nationhood. It will not be long before the catching-up is done!

Central Europe is being led along a path of high taxes and high prices for motor fuels like its counterparts in Western Europe. However, the governments and industry must be careful not to choke off the demand, because

otherwise investment will have to pause. A better example for sustaining investment now would be something closer to the American and Pacific Rim taxation treatment, or at least to spend the fuel taxes on new roads and schemes to ease the increasingly chronic traffic congestion in some cities — and not by the simple expedient of banning private cars from cities either!

The retail petrol investor is looking for:

- Underpumped market
- Low car per capita with growth potential
- Reasonable planning controls
- Secure legal titles
- Motorist-friendly tax regime
- 'Reasonable' margins, not too small as in Poland, but not so large as to overstimulate competition either
- 'Sound' locations.

	1990	1996
'D' market share	8.65%	12.38%
'D' market effectiveness	1.01	2.00
'D' average petrol Volumes mn litres/year	6.2	5.3
Market average petrol Volume mn litres/year	6.1	2.6

Conclusion

Whatever the macro-economic situation looks like for increasing GDP and so on, volumes are going to decrease until petrol demand catches up. Investment in petrol retailing in Central Europe has been so far, and will probably remain a long game. Therefore the network planner must choose the most robust locations to withstand the competition and constantly refine and purify the network to maintain competitive advantage.

In this way, by sound network planning, he can hope to survive and prosper in the long term.

Acknowledgment

The author is grateful to the company Brand 'D' for its permission to use extracts of the data from 1990 and 1996 market models of Budapest on which this case study is based.

A typical new service station in Budapest – but not Brand D

Benzina as — challenges and progress

By Vladimír Dolansky
Director for Development, Benzina as

The Czech Republic was the first of the Central European countries to attract foreign investors to its refining and fuel retailing sector in the early 1990s.

Some 20 percent of state-owned oil company Benzina sp's service stations was sold off to small companies and private foreign investors in the initial process, followed by a larger partial privatisation that saw the formation of the joint-stock company Benzina as in 1994. Prior to this, the Czech fuel retail and distribution market had been monopolised by Benzina sp and Slovakia's state-owned oil company Benzinol for more than 40 years.

More recently, Benzina as was incorporated into the Unipetrol holding company as part of the restructuring of the Czech Republic's refining and petrochemicals sector. At present, Unipetrol holds a 90 percent interest in Benzina as, the remaining 10 percent stake divided equally between the Koramo and Paramo refineries.

Breakdown of statistics

Benzina as operates some 271 service stations — some 20 percent of the total fuel retail network in the Czech Republic — and 18 storage terminals, and employs over 1,000 staff (1995 figures). Gasoline accounted for some 56 percent of the company's total fuel sales (some 732,000 tonnes) in 1995, diesel fuel accounting for a further 36.2 percent and heating oil the remaining 7.8 percent.

Meanwhile, some 65.6 percent of retail sales, totalling some 622,000 tonnes, were made up of gasoline sales

New Benzina as service station in Moravia

— of which 31.4 percent was unleaded. Diesel accounted for the remaining 34.4 percent. All the fuels meet European Union (EU) standards. Furthermore, the influence of EU environmental legislation is reflected in the rising demand for unleaded and low-sulfur diesel fuel.

The Litvínov and Kralupy refineries, now known as the Czech Refinery Company following a structural reorganisation in early 1996, are Benzina as' main product suppliers. Unipetrol holds 51 percent of the shares in the new refining company, the IOC consortium holding the remaining 49 percent interest. Lubricating oils and automotive greases are supplied by the Czech oil refineries of Koramo, Paramo and Ostramo.

Focus on the future

Benzina as' development strategy hinges on the forecast growth of the Czech economy and on increased trade with EU and Central European countries. In a bid to retain its position as the national frontrunner in the supply of domestic fuels, the company has embarked on an aggressive marketing drive including advertising via a variety of media, public relations, sponsorship of various cultural, humanitarian and sports activities as well as establishing a comprehensive sales support network. All promotional activities have centred on the company slogan: 'Benzina — Your easy-going drive'.

The company has also increased the range of credit cards accepted at its service stations. The CCS card is now accepted by all Benzina outlets, while the Benzinol card, joint UTA/CCS card and Czech Saving Bank card may be used at selected sites — the latter accepted at 20 percent of outlets at the close of 1996. Eurocard/Mastercard has also recently been accepted at those outlets with a large customer throughput, while the DKV, UTA cards are accepted at 250 outlets and the EuroShell card extended to over 70 sites. Uptake of Benzina's recently launched card is also increasing rapidly.

Much has been invested on upgrading Benzina as' network of service stations in order to meet western standards and expand the range of customer services offered. Indeed, the company is currently working towards the January 1999 deadline that will make the fitting of vapour recovery systems mandatory at all service stations. Just under half the network has been equipped with such systems to date. The upgrade programme is expected to cost some CZK 7 billion over four years and will be part-funded by long-term bank loans.

As already mentioned, Benzina as also owns 18 storage terminals from which it supplies its service station network as well as serving the domestic heating oil sector. It is expected that as Unipetrol consolidates its holdings and Benzina increasingly focuses on the retail market, some of these terminals will be closed down or sold on.

Older fuel retail outlet in Central Prague

Transformation of Slovnaft

By Slavomir Hatina
President, Slovnaft

Slovnaft, a company with a history going back more than 100 years, has undergone a radical transformation in the last few years. Not only are government regulation and direction things of the past but geographical changes have meant substantial alterations to markets.

From 1946 to the 1990s, Slovnaft was a typical socialist state-owned organisation. It was directly managed by the authorities; it could not purchase its own crude and it did not sell products — retail and distribution were separate entities.

All this is now changed. On 1 May 1992 Slovnaft became a joint stock company and a gradual process of privatisation began. The state share in the company is now only 25 percent. In Slovakia the company is the third largest industrial company and the second biggest exporter.

One characteristic, common to other Eastern Bloc bodies, was over-employment. Between 1986 and 1989 employment reached a peak of 8,000 but this has been reduced to under 5,000 and more cuts are on the way — without any decrease in business activity.

Slovnaft holds a dominating position in refining, petrochemicals and in the marketing and distribution sectors. It owns the Bratislava refinery (capacity: 5.5 million tonnes/year and has a 51 percent interest in marketing company Benzinol. In 1995, 5.4 million tonnes of crude were processed, with the crude originating in the Middle East, Russia and the Mediterranean.

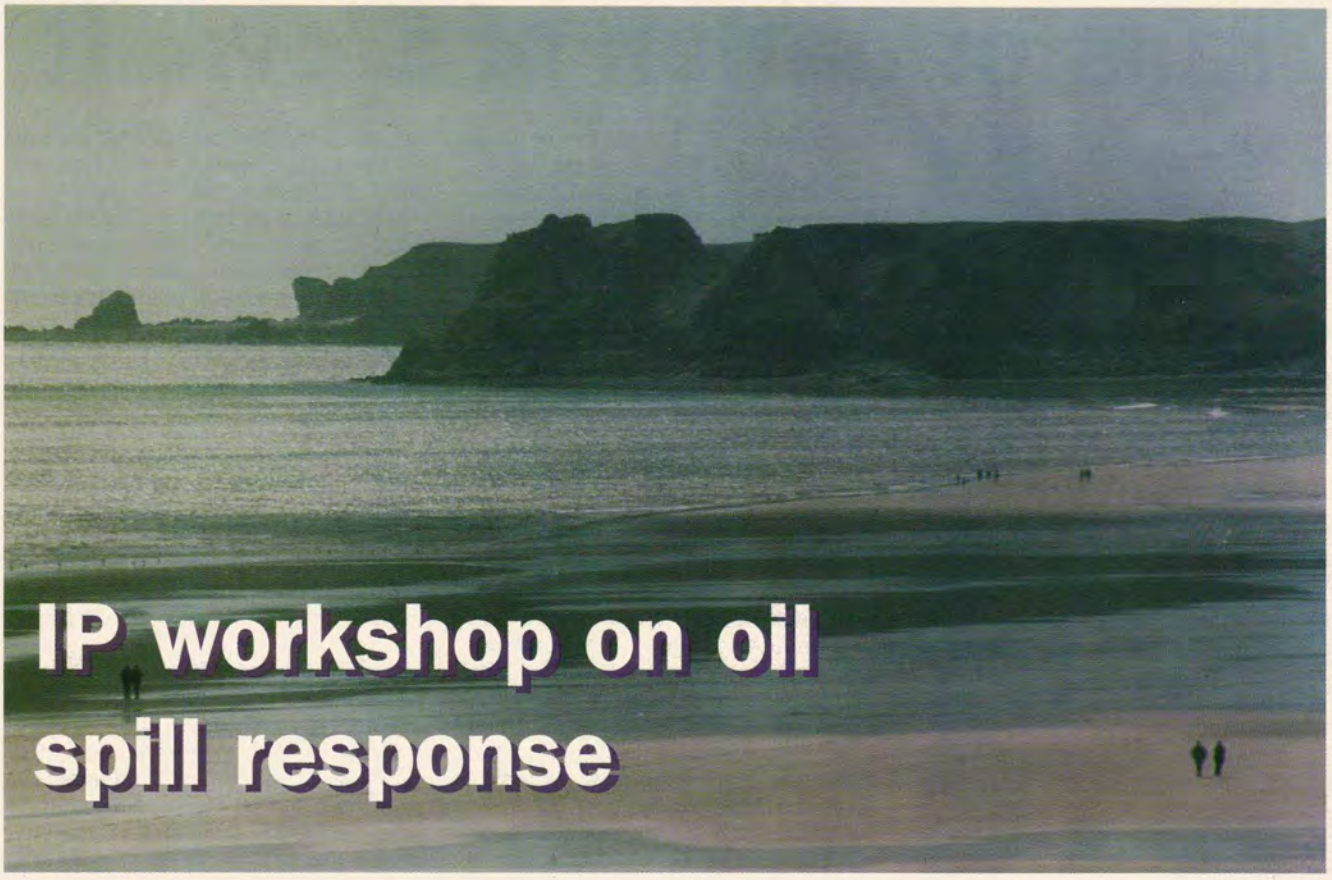
Slovnaft is 'unique' because its capacity was built to cater for Czechoslovakia but in January 1993 Slovakia split from Czechoslovakia. Prior to this date, one-third of all refined products were sold in the Czech part of the country and 10-20 percent was exported. Now, 50-52 percent of refinery throughput is exported, 20 percent of which to the Czech Republic.

One of the current aims of the company is to seek out new foreign markets for its refined products. Since 1994, it has been building service stations in Czechoslovakia, focusing on Moravia because of its proximity. Twelve have so far been constructed out of a planned total of 17 outlets for 1996. Two more have been built in the Ukraine in a pilot project, which enables the company to monitor the local market and tax issues. In addition, plans have been drawn up to participate in a joint venture in Poland where the company wants to have 20 service stations by the year 2000.

In Slovakia itself, Slovnaft is expanding and modernising its retail network with all speed. Back in 1992 it operated 87 service stations. However, since 1994 it has built or modernised 50 outlets, with the result that 50 percent of the network is now of a high standard, with facilities such as a shop and car wash.

By October 1996, it owned 103 service stations, as well as 201 outlets acquired through its 51 percent share in Benzinol. They all sell only unleaded gasoline. Further growth in numbers is prevented by the Slovak anti-monopoly office which demanded at the time of the Benzinol purchase that by the year 2000 Slovnaft should own no more than half the national retail network (67 percent at present). As more foreign and other Slovak companies open new outlets, Slovnaft hopes to achieve this percentage by 1989-99 without having to sell off any of its existing sites.

Slovnaft continues to modernise all its operations. Its capital expenditure budget for 1994-2000 is $911 million. A heavy residue upgrading project accounts for $550 million, while a continuous catalytic reformer has just been completed. Refurbishment of service stations continues, while compliance with EU environmental standards, plus monitoring of air and water emissions are stated aims.



IP workshop on oil spill response

An IP workshop was held last October to analyse the oil spill response to the Sea Empress *incident off south Wales in February last year. Participants came from a wide variety of organisations and local councils to discuss the response side of the spill. How the vessel came to be on the rocks and to spill its crude is still under investigation and will be discussed at a future conference later this year.*

This article summarises the points made in the workshop discussion sessions and draws some conclusions for the future.

Dispersants The general conclusion reached by the workshop participants was that aerial application of dispersants had played a very substantial role in the prevention of beach pollution in the *Sea Empress* incident.

Dispersant approval system The approval system adapted by the Ministry of Agriculture, Fisheries and Food (MAFF) had recently been reviewed and pronounced generally satisfactory prior to the *Sea Empress* incident. This conclusion was vindicated by the subsequent incident.

The objective of the system is to enable the advantages of dispersant use to be realised in practice, having regard to water depth and distance from shore in the first instance and to the need for consultation with MAFF should spraying be judged necessary beyond the initial guidelines.

Workshop participants felt that local authorities could seek wider freedoms in advance of emergencies by consulting MAFF regarding specific locations.

Dispersant effectiveness The amount of the oil dispersed from the *Sea Empress* spill had been evaluated in terms of mass balance calculations of the amount of oil released, recovered and lost by evaporation. However, it was difficult to determine accurately how much was dispersed naturally and how much by the application of dispersants. Nonetheless, the conclusions reached by the Marine Pollution Control United (MPCU) and by AEA Technology appeared to indicate a very substantial contribution from dispersant application.

It was suggested that the monitoring of the oil content of seawater underneath dispersing slicks might be refined and could give guidance in the dispersant choice for approval purposes. However, for the present, the *Sea Empress* results could not be directly applied to this task.

The use of dispersants did not appear to have reduced the effectiveness of the mechanical recovery operation at sea, at least for the particular types of equipment used in this case.

Beach cleaning It was noted that in some cases the exposure of polluted beach material to the surf action had satisfactorily cleaned the material, particularly where the phenomenon of oil-clay flocculation was evident.

It was further noted that beach profiles returned to normal very quickly after such clearance-related disturbance. It was expected that this would also happen in the inter-tidal zone.

Oil-clay flocculation did not cause sedimentation of oil. Its role was to facilitate oil removal from beach materials and its subsequent dispersion into the sea.

The possibility of the stranding of dispersant-treated oil was not considered to present a problem. Rather it was expected to facilitate subsequent dispersion through surf action.

The need for health and safety supervision as well as training in all recovery operations, particularly on beaches, was noted.

Termination of beach operations From an ecological point of view, oil clearance to the point where natural processes could take over would often be sufficient. However, it was noted that, whether beaches were cleaned or not, they tended to return to normal in three years (wave-exposed rocky coasts) or in five years (for salt marshes).

Bioremediation should be encouraged in appropriate locations and where time-scales were acceptable. However, it was recognised that for socio-economic reasons, cleaning to Blue Flag criteria for clean beaches was necessary in much shorter time-scales.

Disposal of recovered oil, oily beach materials and debris Oils collected from water surfaces were stored in oil company tankage prior to treatment/recycling. Oily beach materials were subjected to land-farming techniques on oil company premises and oily debris was landfilled.

While all this worked well after the *Sea Empress* incident, the need for more pre-planning for recycling/disposal of recovered pollutants was noted. This is driven, in any case, by recent legislation which aims to reduce reliance on landfill for waste disposal and to seek recycling, or destruction with heat recovery, where possible. Again, consideration of such options for recovered pollutants leads to the need for intermediate storage and this, in turn, may fall within the requirement of the latest legislation.

Prediction of oil slick movement and surveillance Computer model predictions of oil slick movement were considered helpful by the workshop participants but aerial surveillance was, in any case, thought to be essential in conducting response operations and in checking on the presence of seabirds and other resources at risk.

Apart from the instrumented aircraft now used routinely for surveillance, helicopters with a trained observer onboard additionally filled a useful role close to shore but care was needed to prevent birds from being driven from the safety of ledges into floating pollutant.

The benefits of detailed coastal resource/sensitivity maps were recognised.

Organisation MCPU is responsible for the National Contingency Plan and takes the lead in oil spill response at sea. It also provides assistance to local government and port authorities. In all cases it seeks to promote good working relationships.

Incidents, however, call for substantial labour forces way above permanent staff levels. This need is supplied through co-operation with other relevant specialist organisations through subcontracting and by the efforts of voluntary organisations.

Management The management issues arising from such diverse response team composition have apparently been dealt with adequately but further attention should be given to the issues raised should an even bigger or more serious incident occur, which might affect an even larger area than the *Sea Empress* spill did.

Cost recovery The mechanisms of cost recovery are well-known. Concern was expressed at the workshop, however, about cash flow problems which arise while the response is underway and prior to settlement of claims. It was recognised that claim settlement is greatly facilitated by good record-keeping.

The future

The workshop recognised the benefits of on-scene effectiveness monitoring and welcomed the prospect of further work in this area.

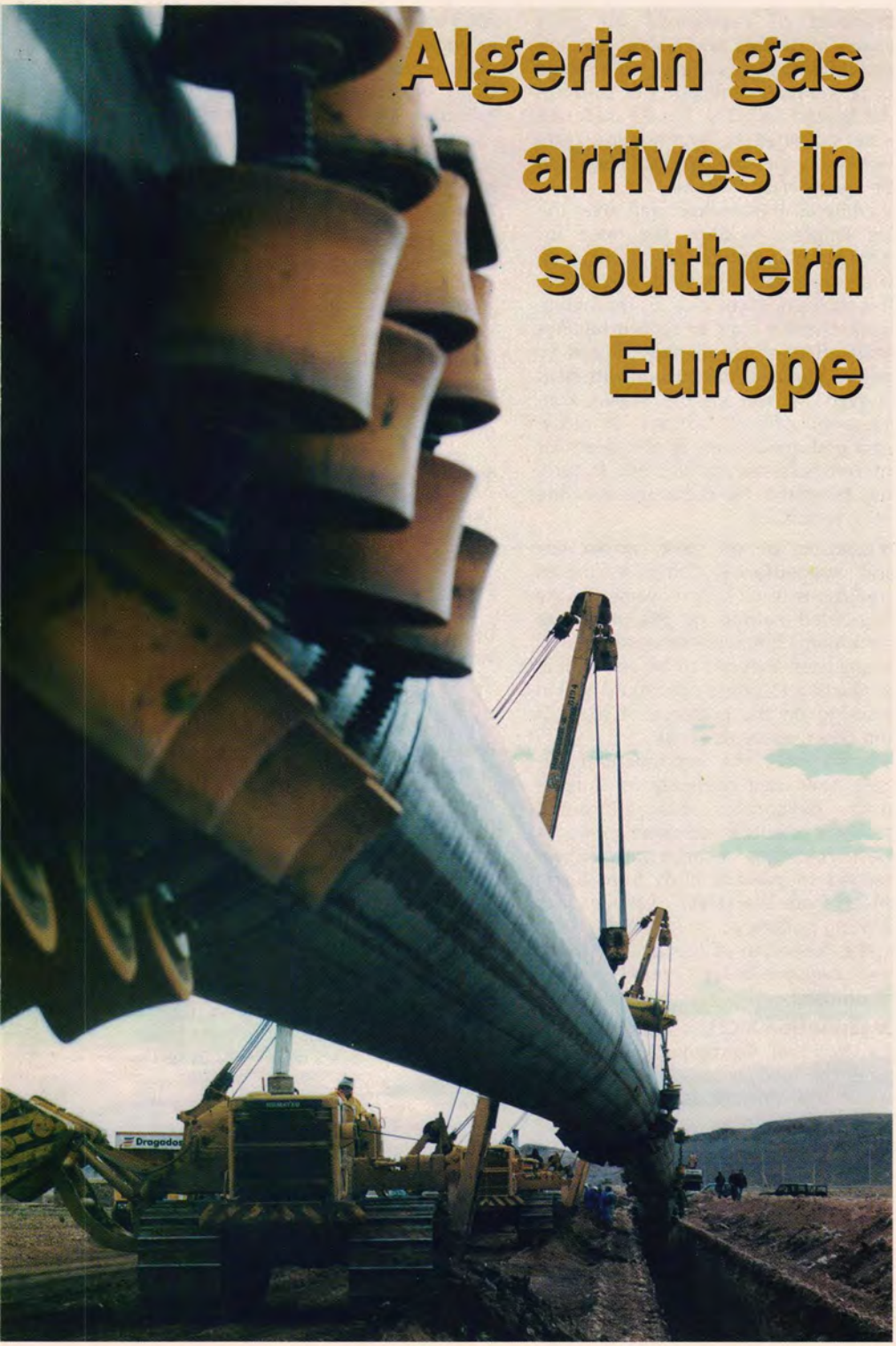
The development of new *in-situ* beach cleaning techniques was very welcome, particularly in the light of current and future landfill limitations.

The identification and development of oil recycling and final disposal options needed further consideration.

The very substantial evidence of improved organisational ability which has manifested itself in terms of data collection in this incident is to be welcomed and encouraged for the future. This was particularly notable in respect of sea water-oil concentration monitoring; the collection of seabird casualty statistics; and the opportunities taken to innovate and record effectiveness results obtained in beach-cleaning techniques. The efforts made to prepare budgets of oil fate in terms of mass balance is also to be welcomed. All of this augurs well for the future and is to be encouraged.

The workshop participants hoped that steps will also be taken to ensure that the complex and diverse management/organisational issues continue to be reviewed and developed and that these matters would be reflected in future contingency planning.

D Cormack, Chairman



Algerian gas arrives in southern Europe

By Ignacio Gutierrez and Daniel Whitaker

Since 1 November 1996, Spain's gas system has been connected to Algeria's Hassi R'Mel oilfield via the new Maghreb-Europe pipeline. The 1,430 km pipeline has some 10 billion cubic metres (bncum) of capacity and passes through Morocco and the Strait of Gibraltar before reaching Cordoba in Spain, where it meets the main Spanish grid. The Spanish grid, in turn, is having the capacity of its connections to the Portuguese and French systems increased, with a view to utilising a planned near doubling of the Maghreb-Europe link's capacity in a later phase. The pipeline's opening comes after four years of protracted negotiations and 18 months of feverish construction.

Within Spain, the gas market is expected to double both in terms of customers (to 7 million) and quantity (to 7 bncum). Gas will also become a major fuel for the liberalising Spanish electricity sector. Politicians and the main companies involved — Gas Natural (Spain), Sonatrach (Algeria) and Transgas

(Portugal) — have publicised on-time construction and under budget costs. However, a few isolated critics continue to point to the threat posed by insurrection on the part of Algerian fundamentalists and near-insurrection by Spanish miners who would prefer coal to be burned in Spain's power stations.

History

The project to build the Maghreb-Europe pipeline dates back to 1989 when Enagas (since bought by Gas Natural), the owner of the gas transport infrastructure in Spain, and the Algerian Ministry of Industry and Mines created a working team to study the feasibility of the project. In September 1990 the team, formed by experts from Spain, France and Germany, confirmed the financial and technical viability of the project. In April 1991 the Ministers of Algeria, Spain and Morocco signed an agreement to build the pipeline and in June 1992 Enagas and Sonatrach, the Algerian gas producer, signed a gas supply contract that would use the Maghreb-Europe pipeline to transport gas to Spain.

In October 1994 Portugal joined in the consortium following the Portuguese government's decision to postpone the construction of the planned LNG plant at Setubal after contracting difficulties with the consortium selected to build and operate the facility. The pipeline came into commercial operation last November, after 18 months of construction work and six years after the initial talks began. However, gas will not flow to Portugal until 1997 when the link with Spain and the necessary infrastructure in Portugal have been completed.

Construction feat

In the first phase of the project the total transport capacity of the pipeline will be 10 bncum of which 6 bncum is destined for the Spanish market and 2.5 bncum for Portugal. The remaining 1.5 bncum will be used to supply gas to Morocco once the market there develops. The second phase plans the expansion of the pipeline capacity to 18.5 bcm through additional compression and a third offshore pipeline under the Strait of Gibraltar. Part of this extra capacity would be used to export gas to Northern Europe. Although the cost of doubling the capacity of the Maghreb pipeline will be relatively low, the export of Algerian gas to Northern Europe is likely to require the expansion of the existing gas infrastructure in Spain.

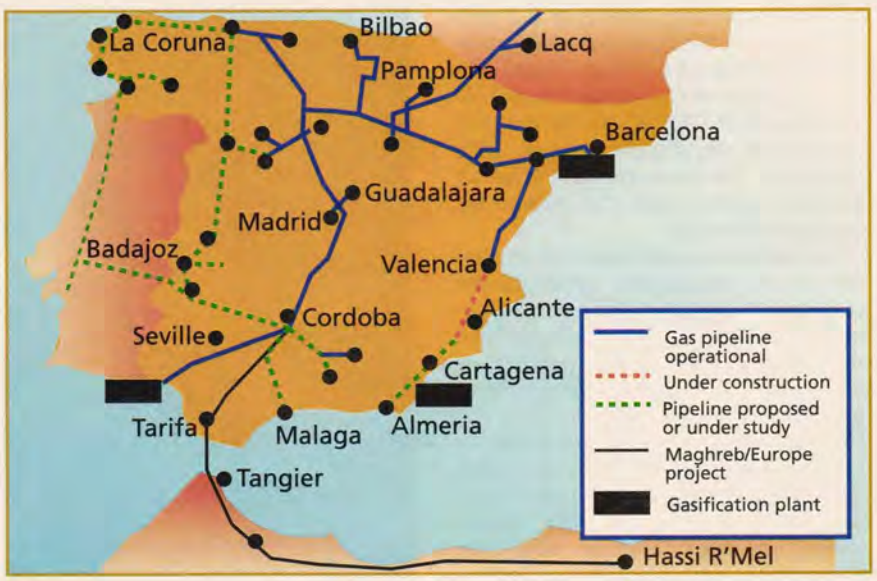
One of the most challenging problems which the pipeline engineers and designers had to face was the crossing of the 45-kilometre Strait of Gibraltar. With depths of up to 400 metres, difficult terrain, strong currents and heavy maritime traffic, the construction of the two 22-inch diameter pipelines crossing the Strait of Gibraltar between Tangier in Morocco and Zahara de los Atunes in Spain is considered the most difficult offshore pipeline project ever undertaken.

Over 80 companies were involved in the construction of the pipeline. The above table lists the main contractors involved.

According to Ignacio Martinez Diaz, Managing Director, European Maghreb Pipeline Limited (EMPL) which is the company responsible for financing the sections of the pipeline through Morocco and the Strait of Gibraltar, the

First phase of the Maghreb-Europe pipeline

	Length (km)	Diameter (inches)	Contractors
Algeria	530	48	Bechtel
Morocco	540	28	Daipsa-Entrepose-Mannesmann-FCC
Strait of Gibraltar	45	2 x 22	Saipem
Spain	270	48	Gines Navarro-Spie-OCP-Bonatti
Saipem-			



two major difficulties encountered have been the acquisition of transit rights and the transportation of all the necessary equipment to the area. The project required the signature of more than 5,000 contracts with owners, most of whom only spoke Berber, with the added difficulty of the lack of a well-established legal framework in Morocco. With respect to the transportation of all the necessary materials, the size of the shipments — 250,000 tonnes of pipes and more than 2 million m^3 of protective coating just in Morocco, as well as the poor transportation infrastructure made it an extremely difficult task. The equipment included that necessary for two 25 MW compressor units in the Moroccan stretch.

International financing

The cost of the Maghreb-Europe pipeline amounted to about $2.5 billion of which 85 percent was debt financed and the remaining 15 percent equity financed. The cost of the Morocco, Strait of Gibraltar and the extension of the pipeline to the Spanish city of Cordoba amounted to $1.3 billion; the Algerian section cost more than $700 million and the connection with Portugal and the development of the transport grid in Portugal added another $500 million. Given the importance of the project in terms of improving supplies to Europe's gas network, the European Union provided a reported $1.1 billion in subsidies and the European Investment Bank provided loans of $255 million for the construction of the Algerian section, $560 million for the Moroccan and Strait of Gibraltar sections and $175 million for the Spanish section.

The complex mix of corporate entities set up to finance and construct the pipeline resulted from the need to minimise the gigantic risks associated with the project and enabled the purchase of Enagas by Gas Natural in 1995. Enagas and the Spanish government entity, the National Institute of Hydrocarbons (INH), were the shareholders of Sagane (Enagas spelt backwards) with 91 percent and 9 percent of its capital respectively. In turn Sagane and the Portuguese gas transport company Transgas were shareholders of EMPL, the company in charge of financing the construction of the pipeline through Morocco and the Strait of Gibraltar. Sagane's and Transgas's stake in EMPL was a function of the share of each company of the total reserved capacity on the pipeline (72 percent and 28 percent respectively). In 1994 the Spanish government decided to transfer temporarily all Enagas shares in Sagane to the INH with a re-purchasing clause built in. This was deemed necessary to enable the sale of Enagas to Gas Natural. In March 1996, four years ahead of the deadline to execute the re-purchasing clause, Gas Natural acquired 91 percent of Sagane for $500 million.

Sonatrach is the sole shareholder for the Algerian section. The Spanish and Portuguese sections are financed through four different subsidiaries of Enagas and Transgas, one for each of the four sections of the pipeline in the two countries: the Tarifa-Cordoba, the Cordoba-Campo Maior, the Campo Maior-Monte Redondo-Braga and the Braga-Tuy section. Enagas dominates the capital in those sections of the pipeline that go through Spain, whereas Transgas controls the Portuguese sections.

Conclusion

The Maghreb-Europe pipeline is one of the most ambitious gas infrastructure projects that have been ever carried out. In spite of its complexity, it has clearly been well planned and managed enabling the completion of the project on time and under budget. It has a number of benefits for the different countries involved:

- in its first phase the supply of gas to the Iberian Peninsula will double
- it enables the development of a gas market in Morocco and Portugal
- exports to France and beyond will become an option in the second phase
- significant fiscal revenues will be provided to Morocco as well as increased gas revenues for Algeria
- a cheap new fuel source will be provided for electricity generation by combined cycle gas turbines throughout Iberia; also, more indirectly,
- by increasing gas supplies to large users such as electric generators who are more conscious of the benefits of shopping around for alternative supplies, it is likely to speed up the liberalisation of the gas market.

On the negative side, the Maghreb-Europe project does not help to reduce the risk of a major gas supply disruption resulting from political developments in Algeria. In fact, by increasing the share of Algerian gas in Spain and Portugal's total gas imports, it increases the exposure of these countries to the risk of such a serious gas supply disruption.

Responding to European refiners' hydrogen needs

By Jane Wiltshire

Refiners are coming under increasing pressure to desulfurise fuels and to do this with conventional technology they will need greater quantities of hydrogen.

This was one of the messages from the inaugural meeting of the European Refining Technology Conference held in London last October. Around 400 representatives from the European refining industry learnt of ways in which hydrogen use could be minimised and hydrogen production maximised within the context of the EU 2000 fuels specifications proposals.

Lower sulfur specifications

EU 2000 proposals place a limit on the maximum level of sulfur in gasoline of 200 ppm and a limit on the sulfur of gas oil of 350 ppm (**Tables 1** and **2**) and the likelihood is that Step 2 proposals for the year 2005 will mean that even greater reductions in sulfur will be required. Levels as low as 50 ppm have been discussed!

Whilst several European countries have already introduced clean or 'city' diesels with sulfur levels as low as 50 ppm, the majority of European refiners are still adjusting to the lowering of diesel sulfur from 2,000 ppm to 500 ppm. The new specification was introduced last October for diesel fuels only — the sulfur level in heating gas oil will remain at the 2,000 ppm level at present.

European refiners with modern hydrotreating capacity were able to minimise expenditure on desulfurisation by modifying their existing hydrotreating units. However, for most, the lower sulfur specifications meant that new units were required. Some of those units have yet to be commissioned. In particular, the 23,000 barrels per day (b/d) hydrotreater at Petrogal's Porto refinery and the 34,000 b/d hydrotreater at Sines are not due to be completed until early this year. This prompted Portugal to seek permission from the European Union to delay the introduction of 500 ppm sulfur diesel until after the units had been commissioned — thus taking the pressure off hydrogen for the time-being.

Pressure on hydrogen

In Northern Europe, however, clear evidence that pressure on hydrogen is building up was given during the month leading up to the introduction of the new sulfur specification for diesel. At this time, the differential between diesel and heating gas oil jumped from an average level of around $2/tonne to peak at $28/tonne during October, before settling back to a level of $10/tonne. The effects were all the more remarkable, coinciding as they did with the surge in prices for crude oil, kerosene and heating gas oil. The price of Brent crude peaked at $25.5 a barrel during October and premiums for kerosene and heating gas oil over Brent crude oil peaked at $103/tonne and $72/tonne respectively — the highest premiums for these products since the Gulf War (**Figures 1** and **2**).

At the same time, the price of gasoline in Europe fell sharply. This fuelled speculation that refiners were having to overproduce gasoline by running reformers at otherwise uneconomic levels simply in order to produce hydrogen needed to run their hydrotreaters. Whatever the truth of this, it seems clear that as sulfur specifications tighten further, hydrogen will become a very precious commodity at the refinery.

Easing the hydrogen burden

Fortunately for the industry, process licensors and catalyst manufacturers are developing processes and

catalysts which will help to ease the hydrogen burden.

New trimetallic catalyst for semi-regen reformers Refiners rely increasingly on hydrogen from the catalytic reforming process to meet hydrogen requirements for hydrotreating. Martin Pike of Procatalyse described a new generation catalyst designed to improve semi-regenerative catalytic reforming yields and catalyst stability.

Whilst refiners with continuous catalyst regenerative (CCR) reformers are able to take advantage of the most selective catalysts under very low reaction pressure conditions to achieve high hydrogen yields and low levels of benzene in the reformate product, refiners with semi-regenerative reformers do not find this so easy. The majority of European reformers are semi-regenerative — around 68 percent of European reformers and 63 percent of European reforming capacity, according to Mr Pike. He estimated that some 57 of these have reforming as their sole source of hydrogen — over half of European refineries.

In explaining the reasons behind the development of the new catalyst, Mr Pike noted that the early reforming catalysts were mono-metallic, platinum/alumina catalysts. Bimetallic catalysts were introduced in 1967. The introduction of a second metal resulted in a more stable catalyst, capable of withstanding reduced pressure operation, thus facilitating the production of higher hydrogen and reformate yields.

The choice of the second metal promoter is influenced by catalyst stability and selectivity for hydrogen and reformate. Iridium and tin offer the best compromise between platinum sintering, coke deposition and poisoning. On the other hand, germanium and tin offer the best selectivity. However, germanium and tin are unsuitable for use in semi-regenerative reformers because of high coking rates and a low tolerance to coke, although they could be successfully used in CCRs. Platinum iridium catalysts are difficult to regenerate. Platinum rhenium catalysts have therefore been the preferred choice of many refiners operating semi-regenerative reformers.

Procatalyse's new trimetallic catalyst (RG 582) was introduced in 1994. The combination of a balanced PtRe catalyst (Re:Pt =1) with a third metallic promoter is said to increase both hydrogen yields and reformate yields. Yields on feed can increase by typically 0.1-0.15% wt. hydrogen and 1% wt. C5+ reformate for an octane of 98 RONC. The catalyst is now in operation in 15 units and results indicate that activity and stability are similar to standard balanced PtRe catalysts. Furthermore, the decline in hydrogen and C5+ yields over the cycle life are low. The third metal also moderates the overall metal activity and so there is a lower selectivity towards benzene.

Procatalyse also illustrated the advantages of using an unbalanced PtRe catalyst (RG492) in the lead reactor and the new trimetallic catalyst in the second reactor, based on the experiences of a refiner who has been operating with Procatalyse's catalysts since 1989. Cycle life was considerably increased, reducing the frequency of shutdowns and helping to maintain hydrogen supplies.

Table 1: Proposed New EU Mogas Specification

Parameter	Unit	Minimum	Maximum
RVP (Summer)	kPa	-	60
E100	vol%	46.0	-
E150	vol%	75.0	-
Olefins	vol%	-	18.0*
Aromatics	vol%	-	45.0
Benzene	vol%	-	2.0
Oxygen	wt%	-	2.3
Sulfur	ppm	-	200
Lead	g/l	-	0.005

*21% for ULG 91

Source: Concawe

Optimising hydrogen and diesel production

Criterion Catalyst's Dilip Davé described his company's solutions to the problem of how to obtain a payback from the production of environmentally friendly diesel. Criterion believes that 'the acceptable fuel of the future will essentially be free of heteroatoms and polynuclear aromatics' and that this will mean fuels having a higher hydrogen

Parameter	Unit	Minimum	Maximum
CN	-	51	-
Density	kg/m^3	-	845
T95	deg C	-	360
Poly Aromatics	wt%	-	11
Sulfur	ppm	-	350

Source: Concawe

Table 2: Proposed New EU Diesel Specification

Figure 1: Diesel/Heating Oil Price Differential (19 August-19 November 1996)

Source: *Petroleum Argus*

content. Mr Davé mentioned that for many European refiners, the gradual tightening of gas oil sulfur levels presented relatively few problems until the announcement of the 500 ppm diesel sulfur specifications. Since which time, most refiners have had to make significant investments in hydrotreating capacity.

As sulfur levels come down further, refiners' first options will be to select high activity hydrodesulfurisation catalysts. Thereafter unit limitations of pressure and temperature will become important. Whilst high pressure and high temperature both decrease sulfur, these can be expensive to obtain. Criterion believes that in these circumstances its 'SynSat' and 'SynShift' technologies offer interesting alternatives to new hydrotreating capacity, since they offer a relatively low-cost upgrading option for heavier oils to lighter oils, rather than simply desulfurising diesel. In Europe, two refineries are already using the 'SynSat' technology — Beta Raffinerie at Wilhelmshaven and the Scanraff refinery in Sweden.

'SynSat' produces low sulfur and low aromatic diesel and 'SynShift' produces low sulfur and high cetane diesel. The 'SynSat' technology allows refiners to control the level of aromatic saturation according to hydrogen availability. Some refiners (those with hydrogen plants) will have surplus hydrogen. Others may have access to hydrogen from merchant suppliers. In these cases, the cost of using the hydrogen needs to be set against the benefits of improved product yields. One Californian refiner apparently selected 'SynSat' on the basis of API gain.

Merchant hydrogen producers have recognised the potential for supplying the refining industry. Significantly, KTI and Air Products recently commissioned a hydrogen manufacturing plant in California to supply several refiners with hydrogen.

The 'SynShift' technology is designed to boost the cetane of low cetane components such as light cycle oil so that they can be blended into diesel. Essentially, 'SynShift' promotes ring opening reactions, whilst keeping the products in the distillate boiling range. Hydrogen utilisation to convert a 0.9g/cm^3 feed containing 65 percent aromatics (Cetane Index 34) to 34 percent aromatics (Cetane Index 44) was quoted as 161 Nm^3/m^3.

Minimising hydrogen production cost

Peter Søgaardt Anderson of Haldor Topsøe described improvements to his company's hydrogen technology which allow for greater recovery of hydrogen and minimisation of hydrogen production costs. These included:

- installation of a pre-reformer which converts all higher hydrocarbons and allows a higher inlet temperature to the tubular reformer
- operation at low steam to carbon ratio without the risk of carbon formation
- downstream catalyst poison protection
- a sidefired reforming concept which enables a high outlet temperature and consequently a high methane conversion to be obtained
- use of a high temperature shift catalyst, followed by a highly active low temperature shift catalyst.

His company has supplied a large number of hydrogen plants to customers in recent years which take account of these improvements, helping to reduce the cost of manufacturing hydrogen.

Biodesulfurisation

So, having looked at processes to increase hydrogen production and at those which facilitate hydrogen management, we come to perhaps one of the most exciting presentations at the conference. This was given by Daniel Monticello of Energy BioSystems Corporation. He outlined the potential role of biocatalysis in desulfurisation, as used in Energy BioSystems' Biocatalytic Desulfurisation (BDS) process. Energy BioSystems have successfully used bio-

Figure 2: Kerosene and Gas Oil Prices (August-November 1996)

Source: *Reuters*

catalysis to desulfurise diesel fractions to levels as low as 79 ppm. A 5 b/d pilot plant is being developed and the first commercial unit could be operational by 1998.

Whereas conventional (reductive) desulfurisation requires the use of high temperatures and pressures and high hydrogen concentrations in order to facilitate the reduction reaction, biocatalytic systems operate at ambient temperatures and pressures and do not require hydrogen at all! Additionally, with reductive desulfurisation, removing very low levels of sulfur from fuels becomes increasingly more difficult. In contrast, the sulfur molecules remaining in hydrocarbon fuels after conventional desulfurisation are ideally suited to removal by oxidative processes. Hence the suggestion that biocatalytic desulfurisation be used as a finishing step to conventional hydrotreatment.

Although the oxidation process has been known to the refining industry for some time, the process has historically been rejected because of the slow rate of reaction and the lack of selectivity. However, just as rate of reaction and selectivity can be improved in conventional refining reactions via the use of noble metal- or silica-based catalysts, so the oxidation process can be improved via the use of protein-based catalysts (enzymes). Once again, this concept is not a new one. It was examined as early as the late 1940s but the problem was finding a bacteria that 'could specifically attack the sulfur atoms in the hydrocarbon while leaving the rest of the hydrocarbon unreacted.'

Such bacteria were discovered in 1989 and have been used successfully in trials by Energy BioSystems. Unlike uncatalysed oxidation processes, the oxygen is activated at the surface of the enzyme and thus reacts only with the target sulfur atom. Another advantage of using the enzymes is that the reaction continues, to form a water soluble product sulfite, which can be converted non-biologically and extracted.

The process scheme involves simple, low-cost technology. The reactor is essentially a continuous stirred tank into which oil, biocatalyst and water are introduced. The product emulsion is separated after the reactor using a deoiling hydrocyclone and low-speed desludger. Stripped water and biocatalyst are returned to the reactor.

The refining industry may be slow to adopt large-scale biorefining but other industries use it quite successfully. Monticello told of perhaps the most striking example — the US corn starch industry used a high temperature acid hydrolysis process to convert starch granules into dextrose syrup. Today, an enzymatic process has completely replaced the older technology.

So, desulfurisation without hydrogen? Energy BioSystems seems to think that its system offers the ideal complement to conventional hydrodesulfurisation. If the process can be successfully commercialised, it may allow refiners to meet very low sulfur specifications without the additional hydrogen burden normally associated with them.

Oxygenates in a changing fuel market

By Barney Parsons and John Westwood,
Douglas-Westwood Limited

Over the past 20 years the world car population has more than doubled to over 500 million. In the past decade gasoline consumption has grown by 30 percent. Air pollution has become an issue of ever-increasing worldwide public concern leading to demands for reduction in the levels of pollutants emitted by automobile engines. The economic costs of this pollution on human health and the environment are estimated at 0.4 percent of GDP. However it is possible that in some areas the costs are substantially higher than this.

Despite the increasing numbers of cars and growing urbanisation in many parts of the world, developments in automobile engine and exhaust systems together with changes in the composition of gasoline have already had significant positive effects on air quality, especially in the United States. In most countries, air quality levels are forecast to continue to improve as continuing technological and fuel developments work their way into the world's car pool.

Throughout the world the use of lead compounds in gasoline is being eliminated and further developments in gasoline composition aimed at reducing air polluting effects are continuing. The use of oxygenates as a blending component in gasoline has played a major part in these developments. They have the effect of allowing more complete combustion to occur and act as an octane enhancer for unleaded gasolines.

Methyl tertiary butyl ether (MTBE) is at present the most important of the oxygenates. Over the past few years it has been the world's fastest growing industrial chemical, with output growing at a rate of up to 25 percent per annum. World capacity has grown from zero in 1973 to 473,000 barrels per day (b/d) in 1995.

The largest producer and consumer of oxygenates in the world market is the United States where oxygenate use is now widespread in areas which have air quality problems. This has occurred as a result of legislative action requiring the use of oxygenates in gasoline. This legislative process is now substantially complete and the market has become stable. Further actions affecting air quality to 2000 will probably not involve significant extensions to the areas mandated to use oxygenates.

Although MTBE is considered to be safe for use in gasoline, in some areas of the United States where oxygenates were introduced, some concerns about their effect on human health were raised at the time. Although these concerns were clustered into a few areas, they were sufficient to have some effect and may have had the effect of discouraging the further extension of oxygenate use.

The world market

We estimate the 1996 demand for oxygenates to be 502,000 b/d and that this will rise to 582,000 b/d by the year 2000, an annual growth of 3.7 percent. This growth rate will be significantly less than that seen up to 1996.

Our study identifies 174 oxygenate plants in production worldwide, with a capacity estimated at 596,000 b/d at the end of 1996. In addition, a further 76 oxygenate plants are planned to be constructed in the period 1996-2000. If all these projects were to come to fruition, then 337,000 b/d would be added to world production capacity. However, we do not expect all the proposed plants to be realised.

The market is in balance at the present time, with 84 percent utilisation of capacity. However, there is a danger of future oversupply. We do not expect all the proposed projects to be realised but several large plants under construction will cause the supply of oxygenates to exceed demand, leading to increasing competition for world markets. The successful suppliers of traded MTBE will be those with low costs and abundant feedstocks such as the large Middle Eastern producers.

A major factor impacting on the 1996 market has been the introduction of Californian Phase 2 gasoline and the introduction of reformulated gasoline (RFG) in the United States. These generally contain 11 percent MTBE.

There will be a gradual worldwide increase in the use of oxygenates as octane enhancers but it is not forecast that there will be any further major boosts to the world demand up to 2000. Europe, for example, is not introducing a fuel reformulation programme which would involve widespread use of oxygenates.

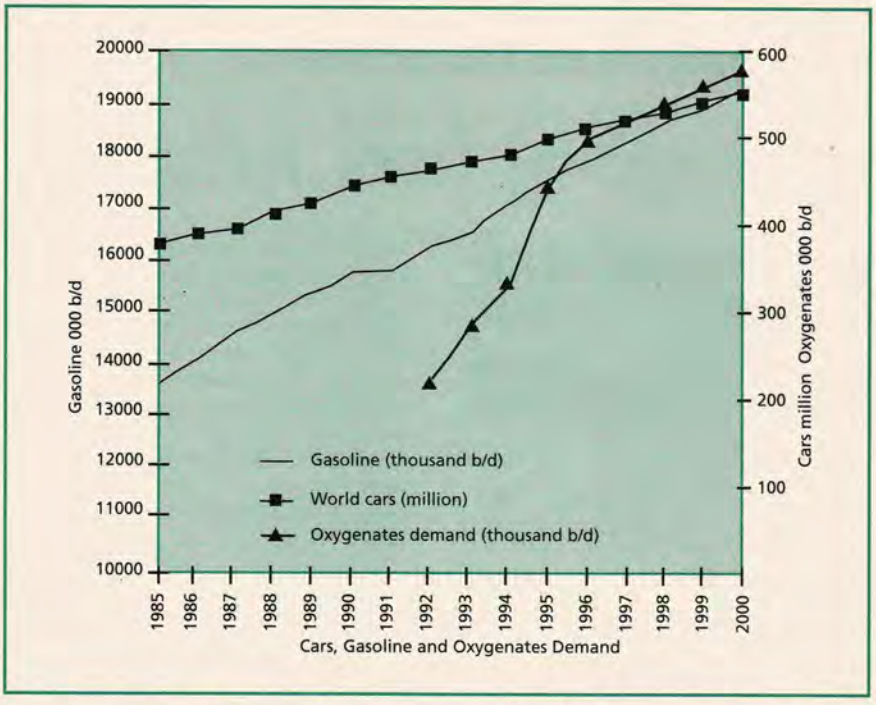
There will be growing competition

between different oxygenates as producers become increasingly able to choose the oxygenate that they make. This will also contribute to an oversupply of product in our forecast period.

Main factors impacting on the market

Government actions Promotion of oxygenates in gasoline has occurred as a result of governments reacting to air quality issues but oxygenate use has undoubtedly contributed to the major reductions in atmospheric carbon monoxide (CO) levels in certain areas of the world. The economics of using oxygenates in a fuel blend are, however, usually unfavourable and the strongest influence for change in patterns of fuel consumption is through legislative and fiscal measures imposed by national governments. Future growth of the oxygenate market will continue to depend on governments actively promoting their use. The European Auto-Oil programme did not provide encouragement and a major opportunity for the growth in oxygenate use has been lost.

The role of catalysts The effect of using gasoline containing oxygenates on exhaust emissions is marginal compared with the use of an efficient three-way catalytic converter — the introduction of these has been the most successful measure taken in the control of exhaust emissions. In the United States they are in widespread use but their penetration in many other countries is more limited. However, problems still exist with these converters during the first few kilometres of a car journey before the catalyst has been brought to its efficient working temperature. Solutions are being developed but it is not likely that they will be in general use before 2000. The introduction of catalytic converters on new cars also affects total emission levels slowly; for example in the United Kingdom fewer than 40 percent of gasoline fuelled cars are equipped with them and by 2000 there will still be 10 percent of unequipped cars on the road. However, as catalyst technology develops, so the fuels required to allow their efficient operation will have to become cleaner.



Choice of oxygenate The most widely used oxygenate is MTBE. Others may have greater importance in future years but this will depend on taxation levels on the raw material used for their manufacture and the pressure exerted by governments to use renewable materials.

Other routes for improving air quality Oxygenates have been presented as a technical fix which can contribute in a small but significant way to air quality problems in a shorter time-span than catalytic converters. Future developments in engine technology will undoubtedly have beneficial effects on emission levels but they will probably take a lengthy time to work themselves into the car pool. Reduction of the emissions from both light and heavy duty diesel engines is seen as a more effective route to obtain better air quality. Other factors in reducing engine emissions will centre around the use of systems which will monitor the efficiency of an engine whilst running.

Consumer reactions to oxygenates Where their use is not widespread, consumer knowledge of oxygenates is low. The main point of consumer interest in gasoline is the price paid at the pump. In the United States new blends have generally been more expensive and this has caused some negative reaction. Sensitivity to pump price outweighs environmental considerations and there have only been limited experiments taken by refiners to market more expensive but cleaner fuels in areas where their use is not mandated. Where such experiments have taken place, they have generally involved diesel fuels.

Health and environmental concerns There have been a number of concerns about health issues relating to the use of oxygenates. However, the risk to consumers appears at present to be very small and oxygenate use is considered safe by governments. Environmental concerns over the presence of oxygenates in ground water are also considered to be slight. The level of concern about oxygenate use in the United States seems to have lessened, as consumers have become more used to it and its price.

Forecast Regional Oxygenate Demand (000 b/d)

Area	1995	1996	1997	1998	1999	2000
USA	240	270	275	280	285	290
Canada/Latin America	25	28	30	32	34	37
Europe	106	120	126	133	140	147
Africa/Mid East	12	14	15	16	17	18
Asia/Pacific	65	70	75	80	85	90
World Total	438	502	522	541	561	582
Year on year % growth	28	17	3.6	3.8	3.7	3.7

Source: 1995 OGJ estimates: 1996-2000 Douglas-Westwood estimates

The future for oxygenates

The main US market for oxygenates has now matured and, although the boom days are over, we forecast a steady world market growth in the use of oxygenates to the year 2000. This growth will be slightly above the rate of growth in the use of gasoline. The main factors influencing the growth are the increase in the use of unleaded gasolines and the availability of oxygenate capacity. Our forecast assumes an essentially stable situation in the market drivers, though it could be subject to sudden unforeseen changes. Possible factors which could have both positive and negative effects on oxygenate use are as follows:

- Although health issues relating to oxygenate use seemed to have less impact at the end of 1996, nevertheless there is potential for a new health scare to arise.
- Developments in alternative vehicle propulsion technology and alternative fuels are not expected to significantly affect the gasoline market before 2000. However, changes after 2000 may begin to have a greater impact — for example, the increased use of LNG/CNG and/or electrically powered vehicles.
- There could also be a push towards the greater use of renewable sources of energy. Although this will not probably occur until there is pressure from increased oil prices, either through natural decline in supplies or more likely as a result of political instability in the main supplier countries.
- The desire to maintain oxygenate content in fuel if US MTBE import supplies were reduced could encourage a rapid switch to ethyl tertiary butyl ether (ETBE) and ethanol.
- The use of oxygenates in diesel fuel: this has not been considered as a possibility in this study but it may occur at a future date.
- Curbs on vehicle use and increasing attractiveness of public transport may also have an impact. Taxation and other measures may well be taken to combat the overcrowding of city centres and these may have a significant effect on markets for gasoline and hence oxygenates.
- Refiners may promote an oxygenated fuel: many refiners, most notably in Europe, are introducing improved fuels, especially low sulfur diesels. It may occur that a major European refiner promotes the use of oxygenate in gasoline and starts a trend which other refiners follow. This could quickly give a significant boost to oxygenate demand, although such a situation is not foreseen before 2000.
- Reviews of air quality standards in the United States take place every five years and any tightening of the standards could have an impact on fuel composition and the demand for oxygenates.

Planned Capacity Increases — Number of Plants

Region	MTBE	TAME	ETBE	DIPE	Total
Africa	2	1	0	0	3
Asia/Pacific	18	2	0	0	20
Central/South America	17	2	1	1	21
Eastern Europe	11	0	0	0	11
Western Europe	5	0	2	0	7
Middle East	7	0	1	0	8
North America	2	3	1	0	6
Total	62	8	5	1	76

Source: Douglas-Westwood

Unrecognised achievements

There is a perception that the air quality in cities is continuing to deteriorate due to the car. The reality is that a new car in 1996 emits 90 percent less of key pollutants than a new car 25 years ago. Despite massive traffic increases the mean annual level of carbon monoxide in central London, for example, is slightly less than in 1977. Such advances are due to the combined efforts of environmentalists, legislators, automobile engineers and fuel technologists. The oil industry is notoriously bad at promoting its environmental successes and such achievements deserve wider public recognition.

Oxygenates in a Changing World Market **has just been published by Douglas-Westwood Ltd.**

Spratly Islands stand-off in the South China Sea

Indonesia recently staged a large armed exercise around the gas-rich Natuna Islands in the South China Sea, leaving its claim to sovereignty over the islands in no doubt. The exercise involved 15,000 marines, landing craft, paratroops, and air and naval forces. By staging such massive military exercises, Indonesia indicates its firm intention to defend such sovereignty if this should become necessary.

By William Scholes

These islands lie in the south of the South China Sea. Further north are the Spratly Islands, 230 barren reefs and islands spreadeagled over 1,000 kilometres. Sovereignty over the Spratlys is disputed; they are claimed by China and the Philippines as well as other Asian neighbours. It is reported that 37 islands in the centre of the archipelago are currently held by Vietnam, seven each by the Philippines and China.

In 1995, in just one of several incidents, the Chinese installed buildings on one of the islands, causing diplomatic protests from the Philippines and unease among the Association of South East Asian Nations (ASEAN).

Interest in the islands is keen because of their possible oil and gas potential as well as their strategic position on the route of Middle East oil destined for East Asia — they are bounded by Malaysia, Kalimantan, Sumatra, Vietnam, the Philippines and Brunei, with China and Taiwan to the north. The islands are only 100 km from Palawan Island in the Philippines where rich oil and gas deposits are being developed.

Indeed, the Spratlys themselves could hold 25 billion cubic metres (bncum) of gas, 105 million barrels of oil and 370,000 tonnes of phosphorus, according to estimates from the Chinese Nanhai Oceanographic Research Centre.

Australian diplomacy

Australian Prime Minister John Howard, worried about his country's trade links, is trying to ease the tension between Australia and China. China has been put out by the closer links which the present Australian government is forging with the United States — a relationship based on the Anzus Pact. Chinese leaders are worried that the United States is trying to influence policy in countries such as Japan and Australia in order to help curb China's military and economic power. However, during his visit to Australia last November, President Bill Clinton denied this.

Mr Howard said recently that at no stage had his government tried to do anything other than keep the relationship with China on a positive basis. In an effort to improve relations, the Secretary of the Department of Foreign Affairs and Trade, Philip Flood, visited Beijing last November.

Chinese strategy

With one of the fastest economic growth rates in the world, Chinese demand for energy is growing rapidly. It is the largest producer of oil among the countries claiming the Spratlys and is the largest user of oil, great quantities of which are imported. The Chinese government hopes to increase its offshore oil and gas production.

Last year China, failing to ratify the UN Convention on the Law of the Sea, issued a statement implying that the entire Spratly archipelago could be under Chinese jurisdiction.

While Malaysia, Vietnam and the Philippines have been increasing the size of their armed forces, there is no doubt that Chinese naval power in the region would be overwhelming if the present dispute deteriorated. Indonesia is the most powerful military nation of the ASEAN group and would no doubt move to protect its interests in the Natuna Islands, located south of the Spratlys.

Australia, concerned over the potentially explosive situation that could arise over the Spratly Islands, wants a negotiated settlement over their sovereignty but no dispute settling body exists. It wishes to see a prosperous and stable China living in harmony with its ASEAN neighbours and is worried by China's claim to dominance of the whole of the South China Sea.

Escalating tension?

There are other islands in the South China Sea where a similar confrontation might occur. These include the Macclesfield Bank, the Paratas and the Paracels. While there is no serious dispute arising over the other islands, the test of China's real motives in the South China Sea will be clear when the question of international arbitration is raised.

The situation in the South China Sea must also be influenced by the relations between China and Taiwan. Only a few months ago China staged extensive naval manoeuvres in the Taiwan Strait which drew a strong reaction from the United States. Another dispute to the north concerns the Senkaku Islands west of Okinawa. These are claimed by China, Taiwan and Japan.

IP Library and Information Service News

Hours

Visitors welcome 9.30 am to 5 pm
Telephone queries 10.00 am to 5 pm
Monday to Friday except Bank Holidays

Library/Information - staff contact list

Tel: 0171 467 then the extension below:

Loans and Periodicals
Liliana El-Minyawi
Library Assistant (ext 7113)

Library holdings and use of Library
Catherine Pope
Assistant Librarian (ext 7112)

Information queries, statistical information
Chris Baker (ext 7114)
Raj Multani (ext 7115)
Information Officers

Catherine Cosgrove
Head of LIS (ext 7111)

IP Statistical Service subscriptions
Raj Multani (ext 7115)

IFEG
Catherine Pope (ext 7112)

Fax: 0171 255 1472

E-mail: lis@petroleum.co.uk

Web Page: <URL:http://www.petroleum.co.uk/petroleum/

1997 prices for information services

Use of Library

All IP Members	Free
Non-member	£16.00 for up to 3 hours £22.00 for full day
Students	£1.50 for one day on production of tutor's letter and student ID card

Photocopying

Photocopy cards (for purchase in Library)

10 A4 copies	£2.00 (20p each)
20 A4 copies	£3.60 (18p each)
50 A4 copies	£8.00 (16p each)
100 A4 copies	£14.00 (14p each)

Photocopying carried out by staff on behalf of:

	Members	Non-members
Minimum charge (20 copies or less)	£4.80 + VAT	£9.60 + VAT
Further copies (per page)	£0.24 + VAT	£0.48 + VAT
Overseas	As above plus postage (£3 if paying in advance)	

Copies from CD-ROMs

	25p (inc VAT) 50p (inc VAT)

Fax Service

Handling charge (2 pages)	£4.80 + VAT	£9.60 + VAT	(Add £6.00
Further pages (per page)	£0.90 + VAT	£1.10 + VAT	for overseas)

Staff research

LIS staff will carry out research in response to requests for technical, market research, commercial and business information using internal and external sources of information as appropriate.

Staff have access not only to the comprehensive in-house collection but also to hundreds of bibliographical on-line databases on a variety of hosts such as Orbit and Dialog. The most frequently used databases include Tulsa, Geoarchive and Predicasts.

Charges include staff research time (£44.00+VAT per hour for members; £88.00+VAT per hour for non-members) on-line connect charges, photocopying costs, telecommunications costs etc.

We will give an estimate, and/or work to an agreed budget. Quick queries (up to five minutes work) are answered free of charge, incurring only photocopying and faxing charges, if appropriate.

Databases available to visitors

We have two computers with CD-ROM drives for use by visitors to the library. Except for on-line services, use of the databases is free to visitors — charges are made for print-outs only. LIS staff will give brief guidance on using the databases.

CD-ROMs and other databases held include:

- ***IP Library Catalogue and Periodicals Holding List***
- ***Petroleum Abstracts* (1986-date) — Upstream technical bibliographic references**
- ***OILRIG* — Regulations for the UK Offshore industry, full text**
- ***OSH-Offshore***
- ***SPE Image Library* (contains all SPE papers)**
- ***Reuters Business Briefing* (an on-line database that visitors can connect up to themselves or LIS staff can search on their behalf. There is a fee for this service.)**

Recent acquisitions to library stock

Members can borrow anything from the library which is not designated as 'reference only' material.

Upton D — *Waves of Fortune: The Past, Present and Future of the United Kingdom Offshore Oil and Gas Industries.* John Wiley (1996) ISBN 0471963410

Knott T — *No Business As Usual: An Extraordinary North Sea Result.* British Petroleum (1996) ISBN 0861652029

Reis J C — *Environmental Control in Petroleum Engineering.* Gulf Publishing (1996) ISBN 0884152731

Bilkadi Z — *Babylon to Baku.* Stanhope-Seta (1996) ISBN 0952881608

Luddeke C — *Marine Claims: A Guide for the Handling and Prevention of Marine Claims.* Lloyds of London Press (1996) ISBN 1859780474

Martin J E — *Strategic Alliances: The Oil Industry: The Next Step on the Road to Improved Financial Returns for the Oil Industry.* ABN AMRO Hoare Govett (1996)

A Guide to UK Oil and Gas Taxation. KPMG (1996) ISBN 1850612412

Azerbaijan: Land of Fire. Azerbaijan International (1996) ISBN 0965438805

Simiu E & Scanlan R H — *Wind Effects on Structures: Fundamentals and Applications to Design.* John Wiley (1996) ISBN 0471121576

Cheremisinoff P N ed. — *Storage Tanks.* Gulf Publishing (1996) ISBN 0872013324

People

Price Waterhouse has appointed **Mr Ian Greig** as Deputy Leader of its European Petroleum Industry Tax Group. Mr Greig became a partner in 1989 and is a specialist in oil and gas industry taxation and is based in Aberdeen.

Mr Frank Chapman has been appointed as Managing Director, Exploration and Production and Executive Director (Designate) of TransCo International. Mr Chapman joined British Gas in November last year prior to the proposed demerger of British Gas this spring. Most recently, Mr Chapman spent a brief period as President of Kvaerner Oil and Gas UK during June and July 1996.

Mr Graham Rutherford, Managing Director of Stone & Webster Engineering Ltd, has been elected Chairman of the British Chemical Engineering Contractors Association. **Mr Ken Braden,** Managing Director of Parsons Group International Ltd is the new Deputy Chairman.

Centrex Ltd, the wholly owned subsidiary of RTITB Services Ltd, has appointed **Mr Ian Benzie** as Managing Director. **Mr R J McCartney** continues as Chief Executive and Managing Director of RTITB Services Ltd. **Mr David Dovey** has been appointed Director of Sales & Marketing, **Mr Bob Baird** as General Manager South and **Mr Gordon McGarvie** as General Manager North.

Mr Iain Vallance, Chairman of British Telecommunication has been elected to the board of US oil company Mobil Corp. He is also a non-executive Vice-Chairman of the Royal Bank of Scotland.

Mr John S Chalsty has been elected to Occidental Petroleum Corporation's Board of Directors. Mr Chalsty is Chairman and Chief Executive Officer of Donaldson, Lufkin & Jenrette Inc.

Mr Rob George, formerly

Mr John Thrift has joined Concept Systems in the new position of Business Development Manager. He recently resigned from Geocon where he held the post of Managing Director for several years.

Sales & Marketing Director of TM Technology Ltd, has been promoted to Managing Director.

Mr Andrew McHardy, a member of the Institute of Petroleum, has just been appointed an Honorary Associate in the Centre for Petroleum and Mineral Law and Policy (CPMLP) at the University of Dundee.

J Ray McDermott (JRM) has announced that **Mr Mike H Lam** has been named President and Chief Operating Officer of the company and ssumes additional responsibilities for the company's European operations. Mr Lam, previously Vice President of JRM's Marine Construction Services, is the former Vice Chairman of the board and Chief Operating Officer of Offshore Pipelines Inc. He has been a director of JRM since its merger with OPI in January 1995 and was named President, Marine Construction Services, in September 1995. JRM has also announced that **Mr F Rickey Oehrlein** has been named Vice President and Group Executive, Europe Operations.

Western Atlas International has promoted **Mr Damir S Skerl** to Executive Vice President with additional responsibilities for technology and business development. Mr Skerl will continue to serve as President of the Western Atlas Logging Services division and remain based at the company's Houston headquarters. In addition, Western Atlas International has appointed **Mr Will Honeybourne** to the new position of Senior Vice President of marketing and business development. He will also be based in Houston.

The Secretary of State for Transport, **Sir George Young**, has appointed a new Chief Inspector of Marine Accidents — **Rear Admiral John Lang**. He will commence his appointment on 1 April this year and it is to last three years. The Chief Inspector's role is to head the Marine Accident Investigation Branch (MAIB) which was established in 1989 to investigate maritime accidents in UK waters or involving UK ships. The present Chief Inspector, **Captain Peter Marriott**, will stay until the report of the *Sea Empress* incident has been completed.

HE Abdalla Salem El-Badri, Secretary of the General People's Committee of Energy of the Socialist People's Libyan Arab Jamahiriya, has been elected to the role of President at the 101st Meeting of the Conference of the Organisation of the Petroleum Exporting Countries in November last year. **HE Abdullah Al Attiyah,** Minister of Energy and Industry of Qatar, has been elected Alternate President.
The Conference appointed **Mr Saddam Zabin Hassan,** Governor for Iraq, as Chairman of the Board of Governors, and **Ms Siham Razouki,** Governor for Kuwait, as Alternate Chairman.

Mr Andrew Bakonyi has been named President of Reading & Bates Drilling following the retirement of **Mr Le (Sonny) Voss.**

Kittiwake Developments has appointed **Ms Lynne Clark** as Financial Controller and **Ms Kathy Arliss** as Business Co-ordinator.
Lloyd's Register appointed **Mr**

Mr Bill Smith has been appointed Fluids Sales & Marketing Manager of The Expro Group. Mr Smith will be responsible for promoting Exal sampling and fluid analysis services in the UKCS, Norway and Europe. Previously, he was with Core Laboratories, Aberdeen as a Technical Sales Engineer for the Fluids Group.

Peter Holland as Group Regional Manager, South East Asia. Mr Holland, who started his new position on 1 December 1996, replaced **Mr Jim Mackay** who retired after nearly 30 years with the company. His responsibilities include the overall management of all Lloyd's Register Group offices in the countries within the region.

Dr David Laycock, has been appointed Sales Director of Ethyl Petroleum Additives with responsibility for all sales of petroleum additives in Western and Eastern Europe, Scandinavia, CIS, the Middle East, Africa and South Africa. He started his career with Mobil and was subsequently Regional Sales Manager for petroleum additives at Amoco Chemicals.

Forthcoming Events

January

13th-14th
London: 'The Commercial Implications of the Gas Interconnector'.
Details: Public Relations Officer, SMi Ltd, 1 New Concordia Wharf, Mill Street, London SE1 2BB.
Tel: 0171 252 2222
Fax: 0171 252 2272

14th-15th
Aberdeen: 'Profit from Advances in Subsea Technology'.
Details: ICM Marketing Ltd, 5 Cavendish Square, London W1M 0BX.
Tel: 0171 436 5735
Fax: 0171 436 5741

16th-17th
Germany: '1st International Colloquium — Fuels'.
Details: Technische Akademie Esslingen, Anmeldung, Postfach 1265, D-73748, Ostfildern, Germany.
Tel: +49 711 340 0823
Fax: +49 711 340 0827

30th
Paris: 'Panorama '97': Economic Impact of Recent Events on the International Oil Gas and Energy Scene'.
Details: Mrs Sonia Weisbecker, TTI, 15 rue de l'Arcade, 75008 Paris.
Tel: +33 1 42 65 05 69
Fax: +33 1 42 66 04 47

February

13th-14th
Moscow: 'Oil & Gas Pipeline Projects in Russia & the CIS'.
Details: IBC UK Conferences Ltd, 57-61 Mortimer Street, London W1N 8JX.
Tel: 0171 453 2702
Fax: 0171 631 3214

17th
London: 'Financing the International Oil Industry — the Continuing Challenge'. Details: Pauline Ashby, The Institute of Petroleum.

18th
London: 'The 10th Oil Price Seminar: Managing the Short-term Risk'. Details: Pauline Ashby, The Institute of Petroleum.

18th-20th
Budapest: 'Benzinkút '97'.
Details: Miller Freeman BV, PO Box 200, 3600 AE Maarssen, The Netherlands.
Tel: +31 346 573 777
Fax: +31 346 573 811

19th-20th
Aberdeen: 'Scada Systems for the Oil & Gas Industry'.
Details: Energy Logistics International Ltd, Europower House, Lower Road, Cookham, Berkshire SL6 9EH.
Tel: 01628 525492
Fax: 01628 521928

20th
London: 'Achieving competitiveness through Innovation and Value Engineering'. Details: Pauline Ashby, The Institute of Petroleum.

24th-27th
Coventry: '1st Conference & Exhibition for the Construction & Operation of Underground Utilities'.
Details: Scientific Surveys Ltd, PO Box 21, Beaconsfield, Buckinghamshire HP9 1NS.
Tel: 01494 675139
Fax: 01494 670155

25th
Coventry: 'New Substances: Bench-top to market place'.
Details: HSE, Room 204 Daniel House, Trinity Road, Bootle, Merseyside L20 3TW.
Tel: 0151 951 4595
Fax: 0151 951 4913

Education and Training

Critics misfire

An item on BBC1's 'Money Programme', denigrating National Vocational Qualifications (NVQs), was based on an academic's report which used out-of-date statistics. Other evidence suggests that employers and employees value NVQs highly.

Some 91 percent of employers currently offering NVQs say that they will continue to use them and more than 90 percent of those who have been awarded an NVQ would recommend them to colleagues.

By using 1994 data when NVQs are growing at a fast rate, the report gave a misleading impression of recent progress.

The annual rate of growth for NVQs over the last four years has averaged more than 30 percent. The number of certificates awarded last year was 26 percent up on 1995. Around 1.2 million people already hold NVQ certificates. More than 1 million people are formally working towards an NVQ, with up to the same number doing so but not officially registered, giving a total in excess of 2 million. More recent data also show that completion rates for advanced general NVQs leapt from 58 percent in 1993-94 to 80 percent in 1995-96.

The programme ignored the tremendous progress made by NVQs since 1990. In the oil industry, standards of competence and vocational qualifications are now being used in safety, drilling, process operations in refineries and terminals, engineering maintenance, liquid warehousing, retailing, as well as a range of supporting activities in sales and marketing, commercial management and supervisory tasks, accounting, information technology, training and personnel.

NVQs/SVQs have great strengths which were recognised by the recent Capey, Dearing and Beaumont reports.

However, publicity always seems to be directed to NVQ shortcomings rather than the positive aspects of improved performance and motivation, increased flexibility and preparedness for future work demands, improved quality of goods and services and more cost-effective training. Criticism relating to the use of jargon has already been accepted and changes made.

Competencies serving the business

The Institute for Employment Studies is working with several employers to help them define and use competencies. Some organisations are looking to involve competencies more in management development, while others are using them to help to define changing roles as a consequence of restructuring; others are seeking a closer link between competencies and reward.

Training for SMEs

The Department for Education and Employment has published *Modern Apprenticeships — a guide for small business*, which offers practical advice on recruiting and training to meet business needs. Education and Employment Minister James Paice, said, 'Small businesses fear bureaucracy and have not got time for organising training. This guide shows how these problems are minimised.'

All routes can lead to university

The Universities and Colleges Admissions Service is planning to develop a 'tariff matrix' which will ultimately give equivalent values for A-levels, GNVQs, the International Baccalaureate, European Baccalaureate and Scottish Highers.

Helping pupils to appreciate science

Grants are available to support activities and initiatives aimed at promoting science in schools. The activities can be one-off events or continuing projects. It is expected that the grants will be between £250 and £1,500; proposals must include genuine pupil involvement and clearly define the potential benefits. Their aim is to help teachers make contact with local scientists and engineers and jointly show school pupils some real science.

The Partnership Grants, sponsored by Esso, Association for Science Education, the Nuffield Foundation and the Royal Society, have been designed to encourage ideas for activities from teachers and scientists/engineers that enable schoolchildren of any age to experience something of the nature, processes and excitement of science, engineering and technology and the benefits they bring to society.

Training to save energy and money

Energy Management, a new training package aimed at all sectors of industry, claims to be saving Shell Oil £1.6 million every year.

The UK Energy Efficiency Best Practice Programme has worked with the four largest engineering institutions to produce this package, aiming to save some of the £11 billion lost every year to the economy through poor energy management. The package comprises:

- A video which highlights why energy efficiency is important, with case studies showing how much can be saved.
- An extensive overview of energy use in industry, which outlines the background, objectives and benefits of energy efficiency, as well as the motivation and risks involved. In addition, it explores the methodology of energy management, techniques of energy efficiency and the technical opportunities available
- A wide variety of real-life case studies highlighting some of the many and varied energy-saving projects which companies have adopted to reduce waste, increase profitability and protect the environment, often at low or no cost to themselves
- A workbook of good practice profiles and back-up information with suggestions for activities in training sessions.

The Energy Management training package, available from the four main engineering institutions, costs £500 + VAT.

Engineering for women

A guide to science and engineering initiatives aimed specifically at girls and women has been published by the Engineering Council. *Awards, Courses, and Visits 1996*, published as part of the council's successful Women into Science & Engineering campaign, lists a range of academic courses and other schemes designed to attract more young women into science and engineering.

'Since young women can expect up to 30 years in employment, even if they choose to take a career-break to have children, planning for a worthwhile satisfying career is vital. Engineering offers excellent prospects and this publication will ensure they get the best possible start,' said Engineering Council Director General Mike Heath.

The booklet includes information on short courses or residential events for schoolgirls, introducing them to engineering, science and computers studies. It is also relevant to women returners to work.

Education and Training

The return from Investors in People

The Institute for Employment Studies was commissioned by the Department for Education and Employment to evaluate the impact of Investors in People which provides a framework for employers to align the development of employees with corporate business goals. The study covered 1,800 workplaces as well as surveys of employees and in-depth interviews with employers.

The reasons most commonly cited by employers for participation in the scheme included:

- Better training systems
- Improved workforce outcomes.

Employers also felt that Investors could contribute to improved business performance — either generally, in terms of a better external image, or more directly in terms of improved financial performance, higher quality products and higher levels of customer satisfaction; and better management systems — in terms of workplace procedures and communications systems.

Other benefits cited include acting as a catalyst for change and providing an external benchmark.

Around 15 percent of non-involved employers said that they were very likely to become involved in the future, and a further 35-40 percent were undecided. Non-involved employers mostly fall into one of five categories:

- The unaware
- The uninterested
- The unprepared
- The emulators
- The primed

It currently takes employers an average of two years from start to finish to meet the Investors in People standard. The time taken to achieve recognition has doubled since the first batch of employers joined the programme. Employers committed to becoming Investors in People in recent years have generally found it harder than expected to achieve the standard for the following reasons:

a) The distance they have to travel — either in terms of the culture of the organisation or the extent to which appropriate systems and processes are already in place.

b) Lack of effective external support — some found difficulty with the help they received from the Training and Enterprise Council, with the quality of the Investors assessor, or in assembling the evidence.

c) Lack of internal commitment — the length of time it takes to achieve the award appears to be influenced by the degree of commitment within the organisation to the process.

d) Organisational change — changes in ownership or major internal reorganisations meant that in some cases Investors was put on to a 'back burner' until the new structures had bedded down.

A consistent overall picture has emerged over the last three years, with employers believing that their involvement with Investors has had a significant, positive influence on their approach to training.

Three-quarters of the employers involved said that they had achieved the improvements they had expected. However, two-thirds said that they could have achieved the same result by other means. Investors is therefore not a unique vehicle for bringing about improvements in training systems and outcomes. That said, relatively few employers would have made the same changes at the same time in the absence of Investors.

As a result of Investors,

- Employers have become more systematic in their approach to training
- Training is concentrated more on employees who require it and therefore more directly related to business needs.

By and large, Investors appears to have more of an impact on the quality rather than the quantity of training. Evidence of a greater amount of induction training being undertaken as a result of Investors was found.

Four in 10 involved in Investors saw training costs rise as a result. One in seven saw their training costs fall as they adopted a more targeted approach and used their training resources more efficiently. As employers move through the Investors process, they increasingly adopt more formal practices, such as written mission statements and human resource strategies.

Employers are interested in Investors as a means of improving the skills and motivation of their workforce and workplace relationships.

Two-thirds of employers involved in Investors said that these benefits had been achieved. The main improvements were in the areas of:

- Employees' understanding of the business
- Employees' skills and competencies
- Employee commitment
- Employee communications

Employers involved in Investors also reported fewer skill shortages year-on-year, while the level of shortages rose amongst non-participants. The differential pattern is statistically significant.

Improved financial performance is not the primary motivation for employers who seek to be an Investor in People. Nearly 40 percent of employers said that Investors had made a direct contribution to improved business performance and a further third said that it had an indirect effect. Of the rest, almost 70 percent said that Investors would have an effect in the future.

The main areas of business improvement were:

- Increased productivity (46 percent of those identifying an improvement)
- Improved quality of service/production (46 percent)
- Increased awareness of business needs and goals (45 percent).

Sponsorship for engineering

A scheme enabling top engineering students to receive a special bursary is being extended to cover 'year-out' breaks.

Arrangements have been made for students on bona fide industry and business experience programmes, such as 'Year in Industry' and company schemes, to defer for one year their acceptance on to the 'Top Flight' bursary scheme. The scheme provides high-achieving students embarking on an accredited engineering course with £500 per year for the duration of the course, in addition to their maintenance grant.

Over the past two years, more than 4,000 students have received these awards. Students already accepted by a university or, in the case of those taking a 'year out', deferring the start of their engineering course until autumn 1997, should apply now. Explanatory leaflets are available from schools and universities.

Students require AAB at GCE A-level, a minimum of three As and two Bs in SCE Higher Grades in Scotland, or an equivalent qualification. The £10-million bursary scheme, which is in its final year, is funded by central government but administered by the Engineering Council.

First in helicopter training

Humberside Offshore Training Association became the first and currently the only centre, not only in the United Kingdom but worldwide, to receive Offshore Petroleum Industry Training Board's approval to run Offshore Helicopter Landing Officer courses. These courses are designed to meet the initial training requirements, including emergency response, for Offshore Helicopter Landing Officers. The realistic, full-size model helicopter, on a helipad, is used as an integral part of the training and provides realism for the practical exercises which are part of this two-and-a-half day course.

The mock-up helicopter has been developed from an old Daihatsu van which has been dismantled and remodelled.

Technology News

Protecting underground service station fuel storage tanks from corrosion

For the most part, service station petrol storage tanks have a life expectancy of approximately 20 years before renovation or replacement is necessary. Indeed, once tanks reach 20 years of age they are required by law to be regularly tested and certified or replaced altogether.

Replacement, however, involves considerable capital investment, while testing and inspection of the tanks leads to repeated shut-down time.

A more economical option is renovation of the tanks to repair existing damage and to protect against further corrosion.

Renovation using a new technique employing Derakane™ epoxy vinyl ester resins together with glass-fibre reinforcement and Parabeam® integral sandwich fabrics provides such corrosion protection with minimum disruption to an outlet's operations.

Developed by Dow Plastics and Parabeam Integral Sandwich Fabrics, the application combines the strength and protection of Derakane resins with the sandwich fabric construction of Parabeam to create a double-walled lining inside the tank structure.

The tank lining is monitored for any reductions in tank integrity, with the sensors eliminating the need for regular inspections and, thus, allowing the service station to remain open for business.

The Derakane 470-36 resin-based lining exhibits good chemical resistance, even against harsh, reformulated gasoline and methanol additives, and cures rapidly in the low temperature environments typically found in underground fuel storage tanks.

Dow has recently developed a low styrene emission version of the resin that has demonstrated optimal cure properties in the check space.

New sandwich fabric lining for tanks

Gas game play

Computer services company Cap Gemini has launched the Network Code game, a role-playing business game designed to help gas companies explore and understand the complex set of rules governing access to the UK national gas supply grid.

Aimed particularly at new entrants to the industry, both shippers and suppliers, in the run-up to full deregulation of the UK domestic gas market in 1998, the game simulates a complete trading year during eight hours' playing time and mimics UK Link, the real-world computer system running the Network Code.

Up to eight competing teams can take part, with all sessions supervised by Cap Gemini network code experts. The winning team is the one which maximises profits over a full year of trading.

The game is available at a number of levels, from an introductory version for complete newcomers to the network code, to bespoke versions for clients wishing to explore a particular commercial strategy in depth.

Portable gas detector for confined space applications

The new Personal Surveyor portable gas detector from GMI weighs just 600 grams and has been designed for use in confined space entry applications in the gas, oil, utility and general safety sectors. It can be used for pre-entry checks and for continuous monitoring of up to four gases, including flammable gas, carbon monoxide, hydrogen sulfide and oxygen.

A single push button operates the instrument, making it simple to use when wearing gloves. The unit can be worn on a chest harness for hands-free use and its low profile ensures easy entry and exit to and from confined spaces.

An LCD display shows all channels simultaneously and a backlight illuminates the display in poor light conditions. A high intensity audible alarm (80dB) and a bright visual alarm warn the user when safety levels have been exceeded.

New gas detector

New means of tackling a burning environmental issue

The Expro Group has developed a high flow rate, portable, enclosed gas burner that burns gas during well testing at significantly reduced noise levels compared with traditional flare stacks. Furthermore, the enclosed structure of the burner means that the flame is shielded from the environment, thereby protecting the surrounding area from light emission, heat radiation and fallout pollution. The Silent Enclosed Burner system is thus particularly suited to use in sensitive terrains such as the Arctic tundra regions and tropical rain forests as there is little infrared heat radiation.

Considerable cost savings are also offered in areas with daylight flaring constraints, as well-testing can take place 24 hours a day, while still meeting strict environmental regulations.

The easy-to-operate unit is the size and shape of a traditional agricultural silo, can be easily transported for on- or offshore use and offers combustion capacities of between 50,000 and 1.5 million cubic metres per day.

The system has already completed a wide variety of testing procedures for Nederlandse Aardolie Maatschappij and will be used for the first time by Elf Petroland in Europe's largest sea bird sanctuary located in the north of Holland.

The manufacturer is now looking at developing the technology for use downstream, as well as a burner that will make it possible to burn crude in the same environmentally safe manner.

Technology News

High accuracy hygrometer guaranteed

The Super-Dew hygrometer from Shaw Moisture Meters has been designed to measure dewpoint temperatures from -110°C to +40°C with an accuracy better than 1 part moisture in 10 million parts of very dry air or gas when used with laboratory-calibrated silver or green spot sensors.

Available in desk or panel mounted versions with a large clear backlit digital display, the dewpoint meter features a one second response time for 99 percent of the change from dry to wet, a five-second calibration check and wet and dry air alarms. The unit also comes with a two-year manufacturer's guarantee.

Dewpoint meter

Detecting oil spills in storage tanks

A device that monitors oil spills from underground storage tanks by measuring refracted light in the surrounding environment has been developed by Ispra in Herzliya, Israel.

The Adelco system comprises a fibre optic cable linked to a light source in a sensor box and a detector connected to an alarm circuit. A microprocessor discriminates between light passing only through the optical fibre and its changed characteristics when a layer of spilled oil is encountered. An alarm is set off once a 2mm thick layer of oil has accumulated at the designated measurement point.

The system can identify whether gasoline, kerosene or diesel oil has been spilt, as well as the exact density of the spill.

Corrosion-resistant densitometer

Solartron has developed a Monel 400 version of its 7826 liquid density transducer for applications involving highly corrosive liquids such as sulfuric and hydrofluoric acids and hot brines.

The transducer uses a vibrating fork element to measure the density of a wide range of liquids. It is mounted directly in the pipeline with the tines of the tuning fork immersed in the liquid and resonated at their natural frequency by means of piezoelectric crystals. A platinum resistance thermometer mounted at the root of the tines allows the unit to correct for changes in liquid temperature that affect the dimensions and modulus of elasticity in the element.

The Monel 400 version is particularly suited for use with caustic soda solutions which are used by oil companies to neutralise hot, desalted crude oil. Caustic soda is manufactured in two concentrations, 73 percent and 47 percent by weight, for on-site dilution with water. However, since caustic soda freezes at 12°C at such concentrations, users must maintain the material at high temperatures, thereby intensifying its corrosive properties. Carbon steel and austenitic stainless steels are subject to corrosion at around 100°C, above which temperature materials such as Monel 400 must be used.

Monel 400 densitometer

World first for new downhole pump

A gas handling downhole pump capable of pumping multiphase fluids with over 90 percent free gas at the pump inlet has been unveiled by Weir Pumps. The unit, developed over the past two years with support from Texaco and the UK Department of Trade and Industry, is said to be the first of its kind in the world.

The pump design incorporates a special turbine drive system which utilises power fluid fed to the turbine from a surface or subsea mounted charge pump. The turbine automatically adjusts its speed to compensate for the varying product density with changing void fractions, power supply being nominally constant.

Manufactured from abrasion resistant materials to withstand the erosive actions of sand particles in the well fluid, the pump can perform across a wide range of water, oil and gas combinations as well as under severe gas slugging conditions.

Pump performance is unaffected by high temperatures, making the tool suitable for use with hot wells, says the manufacturer.

The pump can be installed using conventional tubing, coiled tubing or by wireline — an advantage for subsea installations where no platform facilities are available.

Valve spots liquid density differences

Alan Cobham Engineering is marketing a new valve said to be capable of determining a density difference of just one percent in a fluid flowing through it and which will shut before 10 litres of that fluid has passed through.

Density detecting valve

Developed in collaboration with a major oil company, the new valve can be used as a water drain valve or for detecting density differences between various grades of aviation fuels. Density sensitivity is 0.01sg across a 0.68sg to 1.2sg range.

The valve is available in cast aluminium or stainless and carbon steels. Options include a manual check function. The unit can also be supplied preset to discriminate between two density limits.

Improved fracturing fluid

Following successful field tests in North and South America, Halliburton Energy Services has introduced a new borate fracturing fluid to the market.

The Delta Frac™ fluid has been developed specifically for use with low temperature wells up to 140°F.

It offers high viscosity with lower gel concentrations than previously achieved in the industry — a 20-lb Delta Frac service gel provides about the same viscosity as a 30-lb conventional gel. The resulting lower polymer loading helps to reduce formation damage and improve regained fracture conductivity and final results.

The fluid system enables fast, controlled and complete breaks and can be tailored precisely to well conditions, states the manufacturer. Furthermore, the simplicity of mixing the new system can help reduce time on location.

Technology News

Personal protection with Bodyguard

The Bodyguard personal gas detector available from Anachem can detect one, two or three gases and is fitted with high intensity, alternating, audible and visual alarms.

Other features include automatic calibration, recessed on/off and zero buttons to avoid accidental activation and raised oversized buttons allowing the user to operate the device easily even when wearing gloves. The unit comes in a durable alloy case.

Gas detector

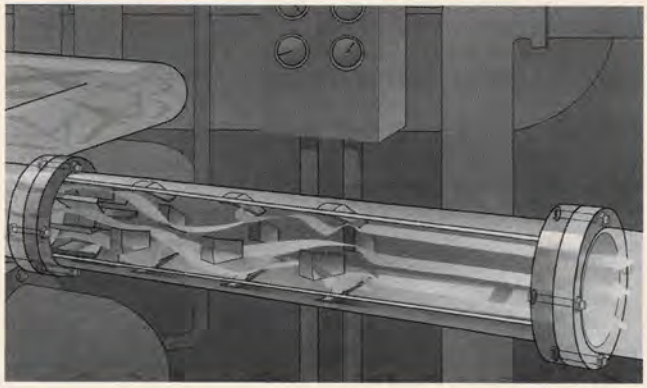
Correcting process flow distortions

A new flow conditioner that corrects flow profile distortions with minimum pressure loss has been manufactured by Vortab™ and is now being marketed in the United Kingdom by Allison Engineering. Such distortions are caused by less than ideal pipeline geometries — usually where straight runs are limited.

The unit can handle gases, liquids, steam, slurries and other process variables and allows optimum flowmeter accuracy to be maintained in systems with only seven diameters of straight upstream pipe and as little as one diameter downstream.

Four flow conditioner models are offered to suit a range of pipelines, including VSR-Short Run which has been designed for retrofits and upgrades.

A range of material options are also available, together with flanged or threaded connections.



The flow conditioner corrects flow profile distortions

Real-time corrosion monitoring

A real-time, on-line monitoring system combining corrosion, vibration and performance assessment for process industries has been unveiled by the Mentor_1 Group.

The system addresses critical plant operations by providing live data on the 'health' and operational performance of equipment, enabling the optimisation of repair and maintenance schedules, the reduction of operational damage and the improved control of life-cycle costs.

Designing safer offshore platforms

A three dimensional gas explosion and dispersion simulation tool used for the safer design of offshore platforms has been made available to the offshore industry at large.

Having already been used in the design and explosion risk control in over 300 platform and process plants worldwide and used in the public inquiries of incidents such as Piper Alpha and West Vanguard, the Flame Acceleration Simulator (FLACS) has been released for in-house use through licence agreements made with Christian Michelsen Research (CMR).

The system — which models the explosion, gas dispersion and ventilation in both onshore and offshore process areas, analysing the complex interaction between the reactive gas flow and the turbulence generated by even small equipment — is the result of over 16 years and £14 million research and development by CMR, supported by 10 oil and gas majors as well as the UK Health and Safety Executive, the Norwegian Petroleum Directorate and Germany's BMFT.

FLACS is currently owned by BP, Elf, Exxon, Gaz de France, Mobil, Statoil and CMR. Funds raised through the new licensing agreements will be used to develop the tool further.

New pusher seals meet API standard

Durametallic has developed a new series of mechanical shaft seals that meet API standard 682. The standard, which covers materials, mechanical requirements and qualification testing for such seals used on centrifugal and rotary pumps in the petrochemical sector, has a fourfold purpose: to reduce emissions, ensure plant and personnel safety in hazardous environments and standardise sealing systems.

The PA series pusher seals are of a compact cartridge design with a planned three-year uninterrupted life and operate with both flashing and non-flashing hydrocarbons as well as water and caustic solutions.

The range features a unitised spring assembly and non-damaging seal face drive mechanism as well as interchangeable rotating units and outer gland to simplify unit replacements and reduce the need to carry large stocks of spares.

Contacts

Dow Europe	+31 20 691 6268
Cap Gemini	0171 434 8234
GMI	0141 812 3211
Expro Group	01224 723601
Shaw Moisture Meters	01274 733582
Ispra	+972 9 555 464
Solartron	01252 376666
Weir Pumps	0141 637 7141
Alan Cobham Engineering	01258 451441
Halliburton Energy Services	+1 713 624 3463
Anachem	01582 745000
Allison Engineering	01268 526161
Mentor_1 Group	01189 253220
Christian Michelsen Research	+47 55 57 40 40
Durametallic	0161 848 7061

Institute News

NEW MEMBERS

Mr I M Abdullahi, St Leonards-on-Sea
Mr T J Afolabi, AMNI International Petroleum Dev Company
Mr C O Barry, Middlesbrough
Mr A C Bishop, Ampthill
Mr K G Brown, StarSupply Pet Derivatives Limited
Mr P D Caldecourt, London
Captain R Chinn, Bristow Helicopters Limited
Mr P Cleek, Carson Aerogravity
Mr C S Collins, Aberdeen
Mr G Cornforth, Manchester Drums Limited
Dr J Cousins, Mobil North Sea Limited
Mr G Critchley, West Horsley
Miss A Cumming, PGS Reservoir - ERC
Mr S W Earland, Earland Engineering Limited
Mr A Ehlhardt, IKODA Limited
Mr C G Faultless, Surbiton
Mr P M Fitness, Peterborough
Mr J Fitzgerald, Simmons & Simmons
Mr H R Gabb, Lowe Bell Consultants
Mr P J Graham, London
Mr B A Hewlett, GATX Terminals Limited
Mr F Ihlenbuig, Messer Griesheim GmbH
Mr M Kamikubo, Japan Management Systems Inc
Mr J A Khan, Uxbridge
Dr R G W Kidd, Virginia Water
Mr T J King, Total Oil Marine Limited
Ms R K Monk, Merrill Lynch
Mr R Nilsson, Dresser Wayne AB
Mr D J O'Connor, New Malden
Mr M J Pickthall, Dalton-in-Furness
Mr M J Prendercast, Tyldesley
Mr G M Quine, J P Morgan Securities Limited
Mr N Ritson, Brampton
Mr B Rushworth, Kitari Oil
Mr B Sanderson, Caistor
Mr M Smith, Aberdeen
Mr C D Stephenson, Penarth
Mr J Stewart, TAM International North Sea Limited
Dr N J Stronach, Robertson Research Int'l Limited
Mr H Thaler, Marketline International
Mr D White, Techmac Barton Limited

STUDENTS

Mr A C O Amakiri, Dundee
Mr L G J Thomson, Dundee

NEW CORPORATE MEMBERS

Oil & Bulk srl,
Via al Molo Giano,
16126 Genoa,
Italy
Representative: Capt. F Gambino
Oil & Bulk srl are oil and dry cargo surveyors involved in marine technical services.

Sovereign Exploration Limited,
60 Grays Inn Road,
London
WC1X 8LT
Representative: Mr Peter Youngs
Sovereign Exploration Limited is an upstream gas company with interests in the UKCS. The company is an affiliate of Northern Electric plc.

Elkidwa Surveyors & Marine Consultants,
7th of November St,
Cable Kidmar,
PO Box 16,
Tripoli,
Libya
Representative: Mr G S Sayeh
Elkidwa Surveyors & Marine Consultants are involved in the classification and certification, surveying and inspection, calibration and testing of shipping.

The Highland Council,
Glenurquhart Road,
Inverness
IV3 5NX
Representative: Mr Peter Mackintosh
The Highland Council, the provider of local authority services for the highlands of Scotland, promotes the growth and expansion of local investment opportunities through its economic development service which places great importance in maintaining close links with the oil and gas industry.

Kelly Fuels,
23 Station Road,
Belfast,
Northern Ireland
BT3 9DA
Representative: Mr Raymond Reihill
Kelly Fuels is an importer and distributor of coal and oil throughout Northern Ireland.

Preng & Associates,
Langham House,
Suite 104,
29-30 Margaret Street,
London
W1N 7LB
Representative: Mr Scott Eversman
Preng & Associates is an international executive search firm with offices in Houston, London, Vienna, Moscow and Hong Kong. The company is dedicated to assisting the energy and natural resource industries worldwide in identifying and recruiting highly qualified individuals for executive, management, financial and senior technical positions.

Brian Kellow Commercial Limited,
Burcott Road,
Avonmouth,
Bristol
BS11 8AP
Representative: Mr Brian Kellow
Brian Kellow Commercial Limited is a Foden truck main dealer. The workshop supplies service facilities to all major petroleum companies.

Carrow Commercials Limited,
Kerrison Road,
Norwich
NR1 1JA
Representative: Mr P Clayton
Carrow Commercials Limited specialises in repairs of petroleum regulated road transport vehicles, holding the main dealer franchise for Leyland Daf trucks and LDV vans for the Norfolk area.

Khaleej Lube Oil Company,
PO Box 9150,
Ahmadi
61001
Kuwait
Representative: Mr K E Nafissah
Khaleej Lube Oil Company operates a lubricating oils blending and packaging plant. Besides manufacturing and marketing its own products, it also markets other brands of oils and speciality fluids.

Institute News

NEW FELLOWS

Mr Terry Moore CBE
Mr Terry Moore joined Conoco in 1965 as an economist. After a variety of responsibilities, he eventually retired in 1995 as CEO of Conoco Limited with responsibility for all Conoco's downstream operations in the United Kingdom. Since then he has been engaged as an independent consultant.

Dr Graham Bell
Dr Graham Bell qualified in Medicine at Glasgow University in 1974. After an initial period in General Practice, he joined Esso at Fawley Refinery in 1979. During his extensive career with Esso, he has provided occupational health services to all sectors of the business. Currently he is the Chief Medical Adviser to Esso UK plc. An active member of the Institute, he is a member of Council and from 1992 to 1996 was Chairman of the Advisory Committee on Health.

Mr John Banfield
Mr John Banfield joined the Mobil Oil Company Limited in 1969. He held various posts within the company until he joined the planning department of Mobil Oil Corporation in New York. In 1986 he was appointed Managing Director of Mobil Oil Cyprus Limited in Nicosia. Between 1986 and 1992, he held positions as the Sales Director of Mobil Oil BV, Rotterdam, Commercial Marketing Director of Mobil Oil Company Limited and President of Mobil Oil BV, Rotterdam. In 1994 he was appointed Chairman and Chief Executive of the Mobil Oil Company Limited in London and is currently a Director of Mobil Europe and Central Asia Limited. An active member of the Institute, he is also a Vice President.

Benevolent Fund
The Institute of Petroleum has a Benevolent Fund for the provision of financial and other relief or assistance to necessitous persons who are or who have been members of the Institute and the necessitous wives, widows, families and dependent relatives of such persons as the Management Trustees in their absolute discretion think fit. If members of the Institute are aware of any such necessitous persons, even if their membership of the Institute has ceased, they are asked to inform the Institute. Applicants would be asked to complete a form giving details of their financial circumstances which would be treated in strict confidence. Help might be given for temporary difficulties, such as the cost of convalescence following illness.

AROUND THE BRANCHES

Essex
8 January: *Guns & Hoses — the largest fire-fighting systems in the world,* Mr Kevin Hardingham, Essex Fire & Rescue Service

Northern
14 January: *Transport in bulk,* Mr D Mills

Aberdeen
14 January: *Standby safety vessels — the new concept,* Mr John Martin

Yorkshire
14 January: *The cable revolution — your connection to the future,* Mr N Embleton

East Anglia
16 January: *Emergency Response Training for the Offshore Industry,* Mr Barry Harwood

Midlands
17 January: Annual Dinner Dance

Stanlow
21 January: *The history & development of Ellesmere Port & the Stanlow refineries,* Mr P O'Brien

South Wales
21 January: Visit to Milford Haven Port Authority

London
22 January: *Heavy Fuel Oil — an essential element in the industrial fuels portfolio,* Mr Mike Drew

Humber
23 January: *Development of the Britannia oilfield,* Mr J Tetlow

North East
29 January: AGM, followed by Mr Ian Ward, IP Director General

FIFTY-YEAR MEMBERSHIP

A handful of members have achieved their 50 years of membership with the Institute. They have each been awarded a special tie to mark the occasion.

Mr S E Churchfield, Dr C A Fothergill, Mr H R George, Mr C F Jones, Mr F R B King, Mr R P Langston, Mr K Wetherell

UK Deliveries into Consumption (tonnes)

Products	†Oct 1995	*Oct 1996	†Jan-Oct 1995	*Jan-Oct 1996	% Change
Naphtha/LDF	219,828	358,780	2,351,526	2,468,551	5
ATF – Kerosene	694,205	721,625	6,449,903	6,784,058	5
Petrol	1,891,510	1,925,253	18,130,466	18,449,619	2
of which unleaded	1,211,772	1,319,446	11,420,063	12,424,631	9
of which Super unleaded	78,170	51,331	796,747	597,229	-25
Premium unleaded	1,133,602	1,268,115	10,623,316	11,827,402	11
Burning Oil	199,351	237,286	2,119,530	2,583,882	22
Derv Fuel	1,186,447	1,279,588	11,121,206	11,936,578	7
Gas/Diesel Oil	584,497	612,601	5,984,941	6,309,689	5
Fuel Oil	610,338	579,994	6,628,487	5,672,298	-14
Lubricating Oil	76,815	73,946	751,157	724,080	-4
Other Products	810,067	754,928	7,525,341	7,365,591	-2
Total above	6,273,058	6,544,001	61,062,557	62,294,346	2
Refinery Consumption	562,165	557,020	5,334,136	5,456,732	2
Total all products	6,835,223	7,101,021	66,396,693	67,751,078	2

† Revised with adjustments *preliminary

15th World Petroleum Congress
Beijing, China
12th-16th October 1997

Technology and Globalisation Leading the Petroleum Industry into the 21st Century

Within this theme, the Congress will address itself to scientific and technical subjects, economics, safety, environmental matters and managerial issues. Acknowledging recent achievements, the Congress will deal with the challenges of the next decade.

The **Plenary Addresses** by world renowned speakers will give strategic overview of developments and prospects in technical and managerial fields of interest to the industry as a whole and will include **Wang Tao, President of China National Petroleum Corporation, L R Raymond, Chairman of Board and CEO Exxon Corporation, P H Jaffré, Chairman of Board and CEO Elf Aquitaine, Rilwanu Lukman, Secretary General of OPEC, A E Putilov, Chairman Rosneft, and K T Derr, Chairman of Board of Chevron Corporation (Dewhurst Lecture).**

- The Opening Ceremony and Welcome Reception will be held in the Great Hall of the People, Beijing, the Congress and Closing Ceremony at the China World Trade Center.
- **21 forums** will consider, in the context of the Congress theme, particular areas of the petroleum industry in which there are significant current activities and in which important new developments are envisaged. At each forum four or five major papers will be presented, as a basis for discussion on the platform and with the audience.
- **10 review and forecast papers** will review progress and summarise state of the art technology, current research and future trends in specific areas of high interest.
- **250 posters** on technical topics will lend themselves to visual presentation and individual discussion with the presenters.
- **A Ministerial Panel** of two hours will offer Ministers an opportunity to discuss issues of concern to them.
- A full social programme with daily sightseeing for accompanying persons; an extensive programme of site visits and post-congress tours has been arranged.
- The International Petroleum and Petrochemical Exhibition 1997 will run concurrently. Entry and transfers will be free to WPC participants.
- An additional optional 1-day programme on the Chinese petroleum sector will follow the Congress on Friday 17th October 1997.

Copies of the free technical programme, congress programme and registration form can be obtained from any WPC national committee or:

WPC-97 Secretariat, China
Zhai Guangming, Secretary General
PO Box 766
Liu Pu Kang
Beijing 100724 China
Tel: +86 10 6209 5455/5446
Fax: +86 10 6209 5447/5459

WPC Secretariat, London
Paul Tempest, Director General
61 New Cavendish Street
London W1M 8AR
United Kingdom
Tel: +44 171 467 7100/7137
Fax: +44 171 580 2230

TIGE '97
PROJECTS CONFERENCE

2ND TURKMENISTAN INTERNATIONAL OIL & GAS '97 PROJECTS CONFERENCE

12-13 March, 1997

Regal Ak Altin Plaza Hotel, Ashgabat, Turkmenistan

PROGRAMME OUTLINE

Plans & Perspectives of the Oil & Gas Industry of Turkmenistan
Legislation & Trade Procedures • Licensing & Joint Ventures
Taxation & Insurance • Project Financing & Foreign Investments
Transportation/Pipeline • Exploration & Refining • Caspian Sea Projects

SPONSORED BY:

EXXON
Bridas
L E
UNOCAL 76
DELTA OIL COMPANY
PETRONAS
Mobil
Денойт и Туш СНГ
Deloitte & Touche CIS
RPI

OFFICIAL ORGANISER:

INTERNATIONAL
TRADE & EXHIBITIONS (JV) LTD

CHAMBER
OF COMMERCE

TURKMENISTAN SUPPORT:

MINISTRY OF OIL & GAS
MINISTRY OF FOREIGN RELATIONS
MINISTRY OF JUSTICE

ITE International Trade & Exhibitions Group Conference Division
Byron House, 112A Shirland Road, London W9 2EQ UK Tel: +44 171 286 9720 Fax: +44 171 286 0177

I am interested in ☐ reserving _____ delegate places ☐ information on advertising opportunities

Name Title

Company

Address

Postcode

Country EMail

Tel Fax

FOR FURTHER INFORMATION PLEASE CONTACT JIM COHEN ON +44 171 286 9720 OR FAX BACK THIS COUPON ON +44 171 286 0177