

MAY 1993

The Institute of
Petroleum



PETROLEUM REVIEW

Yugoslavia

Integrated energy
system forced into
reverse

Coal

Government review
gives only
temporary reprieve
for UK coal

United States

Expanded
regulation of
gasoline emissions

Kuwait

Reconstructed oil
industry plans more
expansion



Designed to meet all our customers' requirements worldwide



MODULAR, FLEXIBLE, UPGRADEABLE, EASY TO USE

We tailor our software to be country, customer and user specific. The 9500 SERIES, the heart of site control, from MICRELEC - the specialist in service station systems.

**FOR TANK TO BANK SOLUTIONS, PLEASE
CALL DEB BRADLEY ON 0932 355255**

MICRELEC

M MEGGITT
ELECTRONICS

Camphill Industrial Estate
West Byfleet
Surrey
KT14 6EW
telephone
(0932) 355255
fax
(0932) 350110

PETROLEUM REVIEW

May 1993 Volume 47 Number 556 £6.00

Subscription (inland) £65.00 (overseas) £80.00

EDITORIAL

Editor: Carol Reader

Assistant Editor: Robert McLeod

Sub-Editor: Lyn Gaffney

ADVERTISING

Advertisement Director: Colin Pegley

Advertisement Manager: Jim Slater

Jackson Rudd & Associates Ltd.

2 Luke Street,

London EC2A 4NT

Telephone: 071-613 0717

Fax: 071-613 1108

APPOINTMENTS AND RECRUITMENT

Advertisement Manager: Brian Broome

2 Luke Street,

London EC2A 4NT

Telephone: 0732 866360

PUBLISHERS

Published Monthly by

INSTITUTE OF PETROLEUM

A charitable company limited by guarantee

Director General: Ian Ward

Membership Services Director: Roger Sparrow

61 New Cavendish Street,

London W1M 8AR

Telephone: 071-636 1004. Telex: 264380

Fax: 071-255 1472

For details of membership, including Petroleum Review at no extra cost, please apply to the Membership Department.

The Institute of Petroleum as a body is not responsible either for the statements made or opinions expressed in these pages.

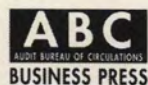
Those readers wishing to attend future events advertised are advised to check with the contacts in the organisation listed, closer to the date, in case of late changes or cancellations.

©Institute of Petroleum

Printed by Eyre & Spottiswoode Ltd, London and Margate.

US MAIL: Petroleum Review (ISSN 0020-3076 USPS 006997) is published monthly for US\$160 per year. Second class postage paid at Middlesex, New Jersey.

Postmaster: send address changes to C&C Mailers International, PO Box 177, Middlesex, New Jersey 08846, USA.



ISSN 0020-3076
MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS

Contents

News in Brief	198
Newsdesk.....	200
Yugoslavia	
The tragic consequences of the break-up of the Yugoslav Federation.....	204
Taxation	
Oil companies consider UK budget provisions.....	207
Coal	
UK coal's future in the balance	209
Bio-fuels	
French policy on bio-fuels.....	212
Interview	
Geoff Cardinal, Chairman of Mobil Oil Co. Ltd.....	214
Alternative energy	
Slow progress for power from renewables.....	217
Forthcoming Events	222
Kuwait	
Which way forward for a revitalised oil industry?	225
Ether-based oxygenates	228
United States	
Expansion in regulation of gasoline emissions	229
Ecuador	
Major expansion plans outside OPEC.....	232
Australian companies seek tax review	235
Technology News	238
People	241
Institute News	242
Consultants	244

Cover photograph courtesy of Elf

23 March

ENI, the Italian state-owned energy group, plans to restructure its foreign subsidiaries in order to make them financially more accountable.

Brazil's state-owned oil company, Petrobras, plans to cut the number of wells drilled this year to 358 from 385 in 1992.

Exxon has said that it intends to spend more than \$30 bn over the next few years on more than 90 offshore projects around the world.

Strike action has disrupted loadings at the Nigerian Escavos crude oil terminal operated by Chevron Nigeria.

Vietnam estimates that domestic oil production will increase to 600,000 b/d by 2000.

24 March

Investment in Norway's offshore oil and gas industry is expected to peak at Nkr51 bn (£4.95 bn) this year, according to a report by Wood Mackenzie.

LASMO cut is final dividend to 1p after recording a £385m loss last year.

Northern Ireland Electricity is to be sold off in the summer in a flotation expected to raise £300 million. The company has a monopoly on supply and distribution in Ulster.

BHP has partly restored production to the Jabiru field in the Timor Sea. Production stands at 8,000 b/d against a 18,000 b/d peak.

Esso Malaysia Bhd announced a profit of \$25.2 m last year, down from \$39.6 in 1991.

German energy, chemicals and services group Veba has signed exploration and production agreements with Algeria and will shortly start exploration.

Statoil has found a 15cm crack in one of the pontoons on the 76,500 b/d Veslefrikk B platform in the Norwegian sector of the North Sea.

China aims to lift coal exports 50% by the end of the decade.

25 March

Smedvig has sold its oldest rig, West Venture, to a Belgian scrap yard after spending six of the last seven years laid up in Invergordon.

The Peruvian arm of Occidental Oil and Gas has signed a \$34m exploration contract with state oil company Petroperu.

29 March

Esso cut the price of petrol in the UK by 4.5p a gallon following a 6p cut by BP.

BHP is seeking experienced engineers following the awarding of the right to develop the giant Big Bear field in offshore Vietnam.

30 March

Intertanko is considering tougher membership rules following the spate of recent tanker accidents.

1 April

ENI has drawn up plans to sell off part of its subsidiary, Agip, for around \$1.25 billion.

US oil imports are at their highest levels since 1977 and are forecast to reach 8.2 mb/d in 1993 from 7.8 mb/d last year.

Saga Petroleum has upgraded its Snorre reserves by 16 percent to 890 million barrels of oil, 8.9 bcm of gas and 4.5 million tonnes of natural gas liquids.

2 April

A consortium including Sumitomo, Hitachi and Ishikawajima Heavy Industries has won a \$114.4 million contract to build and install a 95 MW combined cycle gas-fired thermal power plant in Bangladesh, due to be completed by November 1995.

Shetland farmers and crofters have been warned by the Department of Agriculture not to allow sheep to graze on ground in the south of the island most heavily affected by the Braer tanker accident.

3 April

US-based drilling contractor Odeco has purchased the fourth-generation semi-submersible drilling rig Ocean Alliance from Lloyd's leasing for an undisclosed sum.

US energy services company, Halliburton, has signed a joint venture agreement with China National Petroleum Company to provide equipment and services to the oil sector.

Chevron and Conoco have signed a air transport sharing scheme for North Sea flights in a bid to cut costs.

The Nigerian government is coming under increasing pressure to begin phasing out its petroleum price subsidy.

4 April

The Shetland Agricultural Association has been formed in response to the Braer tanker accident.

5 April

Norway has expressed concern over EC proposals to open the European oil industry to greater competition as it began official negotiations to join the EC.

The Siberian Tyumen region oil output has fallen from 5.4 mbd to 4.4 mbd in the first quarter.

Twenty six tankers totalling 1.97m dwt have been scrapped in the first quarter compared with 19 (1.46m dwt) in the same period last year.

6 April

The Sullom Voe loading terminal reopened after a two-day closure due to high winds.

Bechtel has signed a contract with the Petroleum Authority of Thailand to build more than 350 miles of gas pipeline.

7 April

Eastern Electricity has signed a deal worth £200M with BHP subsidiary Hamilton to take the entire output of the Johnston gas field which has a life-expectancy of 11 years.

Arrest warrants have been

issued for five more managers from Italy's ENI group.

8 April

Elf is urging British authorities to ratify an agreement allowing National Power to import Norwegian gas into the UK.

Three Japanese companies have signed a 20-year LNG deal with Brunei Coldgas.

Indonesia is to build a 2.2M tonne pa gas train to meet growing demand.

12 April

The Caister and Murdoch normally-manned platforms have been installed in UK North Sea Quadrant 44, 180 km off the Lincolnshire coast. First production from the Conoco-operated gas fields is expected in the fourth quarter.

13 April

Total recorded a second successful well in Yemen which tested 12,000 b/d.

18 April

A North Sea oil man was killed when the basket he was working in fell 15 feet to the deck of the diving support vessel, Stena Seawell.

19 April

Tullow Oil has announced a significant gas discovery in Senegal, one km from its existing pipeline.

British Gas has offered supplies to 102 companies under the release programme designed to encourage competition.

Trafalgar House is to set up a fabrication yard in Vietnam as part of a joint project.

Venezuela's oil industry workers have called off a nationwide strike after agreeing wage increases with PDVSA affiliates.

Total has made a gas and condensate discovery in East Kalimantan in Indonesia.

Brown and Root is to merge two of its offshore and engineering operations in a move to control costs to customers.



Petroleum-Based Land Contamination Conference

Tuesday 25 May 1993
(Please note change of date)

To be held at The Institute of Petroleum

Topics to be discussed at this one-day Conference will include:

- An overview of UK and European legislation on land contamination
- Effects of hydrocarbon contamination on water resources
- Background to the production of the IP Code
- Site assessment
- Health and environmental risk assessment
- Remediation techniques
- Case studies, examples of different clean-up techniques

All delegates will receive a copy of the Institute of Petroleum Code of Practice for the Investigation and Mitigation of Possible Petroleum-Based Land Contamination, published March 1993.

For further information and a copy of the registration form, please contact
Caroline Little, The Institute of Petroleum,
61 New Cavendish Street, London W1M 8AR, UK.
Tel: 071 636 1004. Fax: 071 255 1472.



Current Developments in North Sea Drilling Operations

Tuesday 8 June 1993

To be held at
The Cavendish Conference Centre London

This conference is designed to give an up to date overview of offshore drilling operations. The papers are topical and cover company contractor relationships, safety management, environmental issues, shallow gas hazards and their consideration in Safety Cases, and the technology being developed now and for the future. All these subjects will be addressed by leading experts in their fields.

Papers being presented will include:

- Well Engineering in the Nineties
- Interfacing Drilling Contractor and Operator Safety Management Systems
- Drilling Fluids and the Environment
- Technological Advances for the Treatment and Disposal of Oily Cuttings
- Shallow Gas Hazards - The HSE Perspective
- The Use of Active Heave Compensator Systems in Subsea Well Work
- The Current Focus of Drilling and Downhole Technology R&D in Europe

For further information and a copy of the registration form, please contact
Caroline Little, The Institute of Petroleum,
61 New Cavendish Street, London W1M 8AR, UK.
Tel: 071 636 1004. Fax: 071 255 1472.

Enron chief sees positive gas price outlook

Gas prices in the United States could stabilise around \$1.75-\$2.00 a million British Thermal Units (MMBtu) over the summer and autumn before rising to \$2.25-\$2.50 over the next two-three years, according to the chairman and chief executive officer of one of the US' biggest gas companies, Enron.

Kenneth Lay said the tightening of the market over the last months is being bolstered by the Clinton administration's preference for natural gas on environmental grounds.

'The increased call on gas could see a reinvigoration of the US gas industry,' Dr Lay said. 'Supply and demand are

now more in balance, as evidenced by the peak in prices last winter after Hurricane Andrew.'

The development of a spot market for gas in the United Kingdom would also be welcomed by the company. Dr Lay believes that a spot market of around 30 percent of demand would 'provide a valuable tool' but admitted that the market in the United States – where it had at one stage accounted for 80-90 percent – had been 'overdone'.

'Long-term contracts are still necessary for development decisions,' he said.

The recent removal of drilling incentives in the

United States saw a sharp fall in onshore rig utilisation. Dr Lay believes that a more broad-based incentive for drilling could be introduced that would assist the United States replace its dwindling domestic gas reserves.

Meanwhile, the company's overseas arm, Enron International, is considering buying into North Sea fields after its attempt last year to purchase Chevron's 25 percent share in the J-block in the central North Sea was blocked at the last minute by British Gas exercising its pre-emption rights. It is understood that negotiations with an undisclosed company are at an advanced stage.

Collision shutdown

A collision between a stand-by vessel and accommodation support rig led to the temporary shutdown of a North Sea oil field.

The vessel, *Cam Sentinel*, lost power and collided with *MSV Tharos*. The collision resulted in damage to both vessels. At the time of the collision *MSV Tharos* was not connected to the Elf Enterprise-operated Claymore platform although production was shut down as a precautionary measure. The Scapa field was also shut down for a period.

The fields produce a total of 89,000 barrels a day.

More than 130 non-essential personnel on-board the *Tharos* were transferred to Claymore before being returned to shore.

The collision resulted in a three-inch gash above the waterline of one of the *Tharos*' legs which was temporarily repaired. There were no reported injuries. The *Cam Sentinel* damaged its steering gear and was towed to Invergordon.

Oil production forecast to hit record levels in 1995

Offshore oil production in the North Sea and associated areas is set to reach almost 5.5 million barrels of oil a day (mbd) by 1995, an increase of 41 percent over 1991 levels.

The forecast is made by Mackay Consultants who predict that the UK share of oil production will increase from around 1.75 mbd in 1991 to 2.52 mbd by 1995, an increase of 44.4 percent. The region's other significant producer, Norway, is set to increase its production from 1.94 mbd to 2.69 mbd, or 38.9 percent.

Mackay has attributed the increases to new fields coming on stream to replace the declining older fields particularly in the UK sector. The high level of development activity over the last five years is not expected to continue and the analysts expect production levels to fall past 1995. Future field development could also be affected by low oil prices.

Offshore gas production is also set to increase from the 1991 level of 108.6 billion cubic metres (bcm) to 141.7 bcm. The United Kingdom should see the greatest production hike – up 40.6 percent over the period. The Netherlands should see an increase of 32.7 percent; Norway, 16.8 percent; and Denmark, 5.3 percent. German production is unchanged and Ireland suffers a drop of 2.5 percent.

Although too early to quantify, a fall off in drilling activity as a result of budget changes is expected. This could exacerbate the present downward trend.

A total of 276 exploration and appraisal wells were drilled in 1991, chiefly in the United Kingdom (186 wells), Norway (47) and The Netherlands (35). In 1992 only 131 wells were drilled in the United Kingdom out of a total of 211. The total figure is expected to fall to 179 by 1995 with 105 wells

drilled in the UK sector.

The aggregate North Sea total offshore expenditure market is expected to decline from almost \$32.5 billion in 1991 to \$27.5 billion in 1995, a decline of about 15 percent and practically all in the UK sector.

In the United Kingdom, exploration expenditure is forecast to fall from \$3.588 billion to \$2.070 billion in 1995, development expenditure from \$9.405 billion to \$5.707 billion and operating expenditure from \$6.074 billion to \$5.912 billion.

Mackay expect 1995 to be the peak year for UK oil production, surpassing the 1985 peak. New developments coming onstream after that will not meet the declines from larger fields.

The report indicates that while production and operation costs have increased over the last decade, exploration and development costs have actually fallen in real terms.

Power failure hits production

More than 30 non-essential workers were evacuated from the Montrose Alpha platform after a power failure forced the shut-down of the field.

Production at the Amoco-operated platform was suspended for two days leaving 80,000 barrels of oil shut in.

There were no reports of injuries and the platform was in no immediate danger although a coast guard report stated that communications with the platform were difficult.

Production from the platform is shipped via Forties to Cruden Bay. Partners in the field are Amerada Hess and Enterprise Oil.

Shell counts environmental cost of petrol station refit

The rebuilt Shell site at Staples Corner in London will offer only unleaded and diesel fuels, reflecting changes in motoring as well as 'raising the level of awareness about unleaded fuels' according to a Shell spokesman.

Figures released in February show that, for the first time, unleaded sales accounted for more than half of total gasoline sales. Industry sources indicate that up to five million leaded fuel users could make the switch to unleaded fuels and Shell is gambling that those users will make the change.

The 24-pump site at Staples Corner underwent a £500,000 refit after being damaged by an IRA bomb. The company believes that it is the sole site in the United Kingdom to offer only unleaded gasoline and motorists approaching the site will be warned that leaded fuel is not available.

Although Shell is reluctant to give precise breakdowns of expenditure, a typical site

such as this requires more than £90,000 worth of investment directly related to environmental measures that are either current legal requirements or industry best practice and would not have been relevant 10 years ago.

The site underwent a pre-development ground survey to determine underground hydrocarbon levels and the old storage tanks were removed. New double-skin epoxy-coated steel storage tanks were installed. A glycol wall separates the two walls which can be monitored to determine an ingress or outflow of water or fuel.

Overfill prevention devices have also been fitted which prevent filling rates over 97 percent. Stage 1b vapour recovery is operational at the site. Provision for Stage 2 has been made and a further £20,000 will need to be invested to bring this into operation. Monitoring wells, leakproof paving, interceptors and petrol-tight manholes were also installed.



The first topsides module for the Scott field facilities was lifted into place at 7.30am on Wednesday 7 April, on behalf of Amerada Hess Limited and the Scott partners. The 8,000 tonne integrated utilities deck was brought alongside the HeereMac crane barge at 3.30am. Slings were rigged to the two cranes and the sea fastenings were progressively cut away. At 6.30am the weight of the module was fully on the cranes and the M44 transporter barge was slipped out from beneath the load.

The Utilities Deck has an overall length of 51 metres, is 38 metres wide and 25 metres high. The structural steel component weighs 4,100 tonnes and the module is fitted with 15,250 metres of pipework, 1,763 valves and 260 kilometres of cable.

Black Sea rig move

Diamond-M Odeco, the world's largest offshore drilling company, has transferred the *Ocean Liberator* rig from the North Sea to the Black Sea.

The semi-submersible rig is the first western owned and operated rig to drill in the Black Sea and is contracted to drill at least four wells for different operators off the coast of Bulgaria.

The rig was towed out of Falmouth harbour on 26 March after operating for many years in the North Sea.

Diamond-M Odeco president, Robert Rose, indicated that the company's 'pioneering' presence in the Black Sea would help it establish a productive relationship with local governments.

Burmah Castrol in lubricants purchase

The lubricant, chemicals and fuels giant, Burmah Castrol, is continuing to expand its specialty lubricants business through a further acquisition.

The company has paid £31.7 million for Tribol, a subsidiary of Zeneca, an arm of Imperial Chemical Industries.

Tribol, based in California, supplies specialty greases and lubricants to customers in the mining, automotive, cement and steel industries. The company has manufacturing plants in the United States and Germany as well as operations in Canada, Chile, France, Italy, Spain and Mexico. Sales for the company totalled \$53 million in 1992 with pre-tax profits standing at \$3.7 million. Net

assets at the end of December were \$21 million. The company employs 300 staff.

A spokesman for Burmah Castrol said the company would complement existing operations with its focus on products for arduous conditions in niche markets. In 1990 Burmah Castrol bought Optimol, a German specialty lubricants manufacturer.

The purchase is being funded by the placing of 4.5 million shares with institutions at 705 pence.

The highly fragmented specialty lubricants industry is continuing to undergo rationalisation and acquisitions as companies jockey for position in the \$1 billion a year market.

Appraisal success

Conoco (U.K.) Limited, as operator, has announced the results of a successful appraisal well in North Sea block 49/22, some 85 miles off the Lincolnshire coast.

Appraisal well 49/22-12 was drilled to a total depth of 10,000 feet by the *Arch Rowan* jackup rig. The well tested 60.4 million standard cubic feet of gas a day with 74 barrels of condensate through a 72/64 inch choke.

This well was an appraisal of the Ganymede field, one of four accumulations proved in blocks 49/22 and 19/17(S), and collectively named the Jupiter fields. The Conoco-operated Victor gas field, which has been in production since 1984, is also located in blocks 49/22 and 19/17(S).

Venezuela to increase production capacity

Speaking in London last month at a conference organised by the Centre for Global Energy Studies, Dr Alirio Parra, OPEC President and Venezuelan Minister of Industry and Mines, announced that Venezuela was planning a big expansion in its crude production capacity. By 2002 it was hoped to be able to produce at least 4 million barrels a day (b/d).

This would mean a huge investment, particularly in the development of heavy and extra heavy crude from the country's massive reserves – so far mostly unexploited. Further investment would be required to meet ever-increasing environmental regulation, to explore in new areas and for refinery upgrading.

Dr Parra told the conference that these plans were estimated to cost \$30 billion for the upstream sector alone. This is likely to exceed what can be generated internally. Therefore, the Venezuelans will be seeking to secure external financing assistance.

As a first step, the development of marginal fields will be undertaken within the terms of agreements with foreign firms – eventually an extra 300,000

b/d is estimated to come from this source. Also planned is the development of offshore natural gas reserves and extra heavy crude.

The first strategic agreement is between Maraven and Conoco for the development of heavy crude reserves. A production rate of 120,000 b/d of 9° crude is envisaged, with subsequent upgrading to 20°. This venture, still subject to congressional approval, represents an investment of \$2 billion.

Another agreement, signed between Lagoven, Exxon, Shell and Mitsubishi, covers the exploitation of offshore natural gas – the Christobal Colon project – at a rate of 700 million cu.ft/day. This project, costing an estimated \$4 billion, should be on stream by 2000. It is currently being put before Congress in Caracas and should receive approval later this year.

Venezuela's aim with these new strategic associations and operating agreements is to produce an extra 700,000–800,000 b/d by 2002.

In addition, the Venezuelans are also looking at an investment of \$10 billion in the downstream sector in the near future.

Consortium awarded production licences in Cardigan Bay

A consortium led by Marathon Oil UK Ltd., has been awarded two production licences in Cardigan Bay.

The awards, the second to be made in the 14th UKCS Licensing Round, were made to Marathon and its co-venturers Santos Europe Limited, Oranje-Nassau Petroleum Search B.V. and Seagull U.K. Ltd.

The licences cover a total of seven blocks adjacent to the UKCS boundary on the western edge of Cardigan Bay and in St. George's Channel. Licence One comprises blocks 102/10, 103/1, 103/6 and 106/27 in St. George's Channel, and Licence Two, blocks 106/18, 106/19, and 106/23 in Cardigan Bay.

Describing the awards, John Parziale, President of Marathon Oil U.K. said, 'I am delighted that our consortium has been awarded licences to explore for oil and gas in these highly promising blocks.'

'An enormous amount of hard work and thought went into our applications and strong emphasis was placed on ensuring that our proposals reflected the environmental sensitivity of this area. Everything that needs to be

done will be done to ensure that marine wildlife and the environment are fully protected'

Making the awards, Mr Eggar said, 'There has been strong competition for the blocks. The Marathon consortium's application was the best in terms of both work programme and analysis of the area's prospectiveness.'

'Furthermore, the application showed one of the strongest environmental analyses submitted in the Round. Given the environmental sensitivity of the area, strict conditions have been placed on the award of the licences in order to protect marine wildlife and the environment.'

'I have decided to award these licences before most other awards to enable Marathon and their partners to make early progress with their plans for exploring prospects in this area. An early award will enable seismic exploration to take place this year. If the prospects identified are confirmed, a new basin will be opened to increase the already wide opportunities open on the United Kingdom Continental Shelf.'

Motorway site for July opening

The first major motorway service area on the southern section of the M25 around London is to open in July.

The contract to develop and operate the much-needed service area on the Kent-Surrey border near Westerham (between Junctions 5 and 6) was awarded to RoadChef in 1991 by the Department of Transport.

RoadChef is a private company and one of the UK's largest independent motorway services area operators. Clacket Lane is one of the biggest projects on the UK

motorway network creating up to 300 full time jobs.

The service area site will provide facilities on the route linking the Channel ports and Tunnel services with the capital and the rest of the country. It is estimated that 120,000 motorists pass by each day.

Elf Oil Limited has been chosen for the fuel supply service station contract.

With estimated fuel sales of 12 million gallons of petrol and diesel in 1993, Clacket Lane will be one of the busiest sites in Europe.

Abu Dhabi gas expansion

Bechtel, in joint venture with Technip of France, has been awarded a \$1.3 billion lump-sum, turnkey contract by the Abu Dhabi National Oil Company to further develop and expand the Emirate's onshore gas facilities at Habshan.

The scope of the onshore gas project includes:

- A new gas processing facility at the Habshan complex that will be located adjacent to an existing two-train gas processing plant. The new facility will be integrated into the existing facilities to form a single,

multi-train gas processing complex.

- A new gas compression facility for the Thamamma 'B' reservoir, about five kilometres from Habshan.

- Six new condensate storage tanks and associated transfer facilities, to be built at the Ruwais refinery. That facility, located on the Gulf coast, is 105 kilometres north of Habshan and 185 kilometres west of the City of Abu Dhabi.

- A series of pipelines, ranging from 10 to 30 inches in diameter that total 245 kilometres in length.

Non-fuel retail sales worth £1.5 billion

Oil companies have responded to consumer demand for a higher level of service and presentation on the forecourt, so that retail sales of non-petrol products increased to £1.5 billion in 1992, according to a new report by London-based market analyst Euromonitor.

The report (which focuses on the six key markets of the United States, Germany, France, the United Kingdom, Italy and Spain) reveals that petrol, the major service station product, had retail value in 1992 of some £17.4 billion. However, operators recognise that it is largely a necessity purchase and anything that can be done to improve the forecourt may encourage non-petrol sales and possibly repeat business.

There has been a strong expansion in forecourt sales of many retail products. The forecourt is a good location for impulse purchases and sales of soft drinks and

confectionery saw growth in 1991 of 17 percent and 26 percent respectively. Tobacco is the largest forecourt retail sector and saw an increase of eight percent in 1991 to reach a value of over £600 million.

The forecourt market for non-petrol car products such as oil, car care and accessories was worth £173 million in 1991.

Another important development has been the improvement of car-related services on the forecourt, such as car washes and vacuums.

These services are a sizeable source of revenue for the forecourt, but are more significant as profit generators. The provision of a range of services is also seen as a way of attracting repeat business and building up customer loyalty.

Some 20 percent of service stations have a car wash facility, and these generated sales of £300 million in 1991.

Maltese concerns over offshore exploration zone

Malta's Deputy Prime Minister and Minister of Foreign Affairs, Guido de Marco, has stated his country's concerns over co-operation in the Mediterranean, particularly in relation to oil exploration.

He stated in part: '[Before the 1970s] the UN started initiatives to review the Law of the Sea, taking into account the conflicting claims on sovereignty over the seabed, sub-soil, and waters.'

This Convention is of great relevance to all forms of exploitation of sea-bed resources but the lack of enthusiasm does not stem from any basic objection relating to provisions for oil-exploration within the Exclusive Economic Zone.

Malta draws its baselines, fully in line with the provisions of the UN Convention. We have no problems of bays, low tides, etc., with the exception of Filfla. This island was not taken into

account by the ICJ when establishing the dividing line between Malta and Libya. Malta accepts this line as the basis of future negotiations with Libya, but has not renounced its claim on Filfla as a valid baseline point. The delineation of Malta's oil exploitability area is to be considered between Sicily, Libya and Tunisia. Areas have been given for oil exploration to the north and south-west to south-east without any negative reaction, with the single exception in 1980.

It is not likely that oil exploration be hindered [in the Mediterranean] as long as safe navigation and protection of the environment is assured. Security considerations are likely to arise from disputes about the delineation of exploration areas. It goes without saying that instability can only have a negative effect on such activity considering the effort and considerable outlay that is involved.'

Brent redevelopment to extend field life into 21st century

Shell and Esso are to spend £1.3 billion on a unique project to extend the life of the UK's biggest North Sea oil and gas producer, the Brent field.

The go-ahead for the Brent Redevelopment Project was announced by Mr. Tim Eggar, Minister for Energy.

Brent is producing 13 percent of the UK's oil and 10 percent of its gas.

As part of the project, the pressure in the reservoir will eventually be lowered to release considerable quantities of oil and gas which otherwise could not have been recovered. This additional production will extend the field's life by more than 10 years.

The extra production will add to the national reserves the equivalent of a small oil

field (34 million barrels) and a medium-sized gas field (1.5 trillion cubic feet).

The field's processing equipment must be replaced before depressurisation can start, as existing facilities were not designed to operate in a low pressure regime. From around the turn of the century, gas will be the dominant production from the field.

Replacing facilities on the scale necessary, whilst keeping the field in operation, has never been carried out. Work on the platforms will begin in 1993 and be completed by 1998.

At the core of the project is a 100-strong international team, based in Aberdeen.

The offshore work will have three elements:

1. Replacing or modifying

facilities on three of the four platforms, to permit depressurisation and to handle the increased quantities of oil and gas.

2. Upgrading and refurbishing the platforms to ensure their operating efficiency for the extended life of the field.

3. Measures to enhance safety.

The schedule will minimise the effect on production. Three of the four platforms will be shut down in succession for about a year from 1994, but only one will be out of production at a time.

Some 3,000 people will be employed by contractors as a result of the project – the biggest single investment made by Shell and Esso since the decision in 1972 to develop Brent.

Baltic motor show

MOTOREX '93 is on its way to becoming the paramount yearly motor show in the Baltic countries at the gates of the vast Russian market.

Estonia has been traditionally three times more motorized than neighbouring Russia and Tallinn, the capital, is perhaps the largest single town in the former USSR where Western cars are more prominent than familiar Ladas and Moskviches.

Motorex '93 enjoyed huge public attention. Twenty two thousand people attended, thrice the 1992 number and from a collection area of only 800,000. Motorex '94 will be run for five days instead of current four and stand area required will be increased two to three times.

Estonia held its first auto shows in 1928 and 1929.

Yugoslavia break-up reverses 40 years of energy development

By John Cranfield

The human misery caused by the violent break-up of the Yugoslav Federation has been a regular news feature for the past two years. Less obvious are the economic consequences but they could be equally tragic. For, over the past four and half decades, Yugoslavia built up an integrated energy system that, while not totally self-sufficient, was able to fuel the growing industrialisation of the federation. With that came advances in living standards. Much of the achievement must now be written off and, when the population once more finds peace it will also find living standards in many cases back to the 1950s.

That's because energy integration left all the federation's republics vulnerable. Had the break-up been peaceful, co-operation would have ensured a smooth transition and the integrated system could have survived. As it is, the violent nature of the dissolution means that each republic now has to rely mostly on its own resources and trading skills. And each is open to blackmail by the others. For instance: most of Serbia's oil arrived via the Adria Pipeline from a terminal on Croatia's Adriatic coast. In the other direction, Bosnia and Macedonia got all their gas from Serbia.

In the mid-1980s, Yugoslavia showed an energy-demand pattern much in line with the rest of eastern Europe. Coal provided 45.4 percent, oil 33.6 percent, gas 12.6 percent and primary electricity 8.4 percent in 1985. All coal and primary electricity

(mostly hydro-power) was indigenous, while about 28 percent of the 300,000 barrels a day (b/d) of oil demand was met from local fields. However, oil production was declining, though local gas output rose steadily through the 1980s. Even so, with gas demand rising steeply, local fields could only meet around one-third of demand.

The pattern started to come adrift in the latter years of the decade, in the wake of Yugoslavia's mounting foreign debt crisis. Oil and gas imports could not be paid for so readily, especially as the USSR did not extend to Yugoslavia the favourable prices charged to its satellites. Barter became the norm, while moves were made to boost local coal and gas production. Nuclear power was proving to be an expensive mistake, while the sudden downturn in the world economy as the 1990s began left Yugoslav energy planners wondering which route to try next, especially as concern over pollution caused by lignite burning swept through eastern Europe. As it happens, the federal planners had the problem forcibly ripped out of their hands.

Slovenia

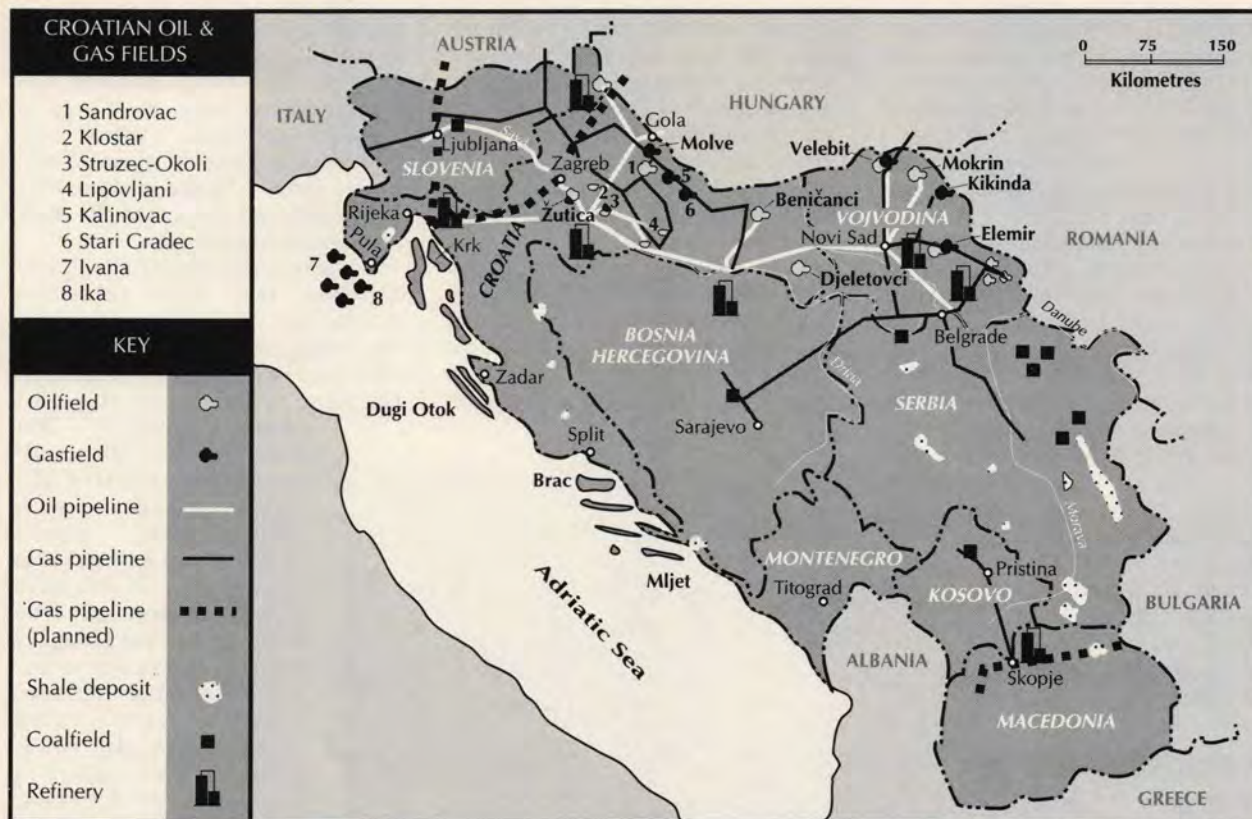
As the first state to break away, Slovenia has had most time to readjust. It also benefits from the fact that it is bordered by Italy and Austria, with both of whom relations

are generally cordial, and has not suffered from the lingering conflict that has dogged neighbouring Croatia's attempts at rehabilitation. And there is no tension with Croatia, on which much of Slovenia's energy supply depends. Although one oilfield exists, the bulk of crude required is fed across the border from Croatia for refining in the Slovene refinery at Maribor, the flow originating from the Adria Pipeline. Gas links are available through Croatia, Italy and Austria.

As far back as January 1990, Italy agreed to supply 600 MMcm/y of Algerian gas to Petrol zemeljski plin Ljubljana (the Slovene state oil company). This trade began in May 1992 and runs until 2007, using a new 20 kilometre (km) pipeline link from Villesse in Italy to Gorizia/Nova Gorica on the Slovene border. The initial 150 MMcm/y tops up the 900 MMcm/y already received from Russia via the Austrian pipeline link (that also supplies Italy until 2005). In January 1993, a new transit and supply deal, running to 2010, was negotiated under which Slovenia would tap off 800 MMcm/y, while Croatia would take 900 MMcm/y-1.2 Bcm/y.

Currently gas provides 16.6 percent of Slovenia's energy needs, a percentage due to rise as the new flows build up. Early 1993 also saw the resurrection of long-mooted plans

This feature can only, given the volatile nature of the situation, be a snapshot of energy affairs at the time of writing (late March). Also, all parts of the region make widespread use of energy sources – such as charcoal, firewood and so on – that are notoriously difficult to quantify and thus never appear in formal statistics.



Oil and gas in the former Yugoslavia.

for an LNG-import terminal at Krk Island in Croatia. If this goes ahead (full details below), Petrol Ljubljana would tap 12 MMcmy from a pipeline carrying gas north to other countries in eastern Europe.

Oil is more of a problem. As long as relations remain cordial with Croatia, the Adria Pipeline link is ideal. But there's an option: import from across the western or northern boundaries. Already Austria's OMV has begun opening filling stations in Slovenia and has taken a 50 percent stake in Maribor refinery. And late last year BP signed up with local firm Autocommerce for the latter to distribute BP lubes across the country. Other western firms seem set to follow.

Croatia

Breaking free at the same time as Slovenia, Croatia should also be well on its way to energy reorganisation. But hostilities went on long after Slovenia found peace, much border territory remains in Serb hands – areas theoretically under UN control – while fighting is still active in some areas. Even so, Croatia has the bulk of Yugoslav energy clout. One of the independent state's first moves was to hike tariffs for Serb deliveries via the

Adria Pipeline to a punitive \$40 a ton, compared with \$8 a ton for other recipients. This was partly in response to Serb confiscation of 200 filling stations in Serbia operated by Croat state oil firm INA-Naftaplin. (All state companies in former Yugoslavia were owned by the republics, not by the federation. Most operated only within their respective republics but exceptions have always existed.)

Besides having a stranglehold on Serbia's main source of crude oil imports, Croatia also produces 2 million tonnes a year (t/y) of its own crude (out of a total Yugoslav flow of 3 million t/y). With Serb demand accounting for about 4.5 million t/y of total Yugoslav demand of 14.5 million t/y, Croatia is in an ideal position to enforce UN sanctions, while at the same time being nigh on self-sufficient in oil and thus not hurting its own economy. And with two major refineries – at Rijeka and Sisak – INA-Naftaplin is a regular exporter of surplus products and even handles processing deals for third parties, capacity being well above need.

Regarding gas, prior to the break-up Croatia produced some 2 Bcmy out of total Yugoslav output of 2.9 Bcmy. Plans drawn up in 1989 – and necessarily held back from full

implementation by the war – envisaged output rising to 2.8 Bcmy in 1990, 3.2 Bcmy in 1993 and 4.0 Bcmy by 1995. Imports would by then top this up to meet estimated demand of 5.4 Bcmy. Even longer term, INA expects domestic output to top 5 Bcmy by 2020, new production coming from the Pannonian Basin in the north and, more importantly, the Adriatic offshore. Plans for the latter, however, have gradually been cut back such that just 400 MMcmy should have begun flowing this year from Ivana field under a \$200 million development. Originally, \$350 million would have gone on a two-field project including Ika, but a finance crisis intervened. The original plan shows the potential: initial flow of 860 MMcmy would have built to 1 Bcmy.

Offshore work was virtually halted by the war, rigs being damaged by bombs and fighter-aircraft attack. Luckily, field development had not begun. But cost now dictates that onshore prospects take precedence and, although Croatia's offshore sector is very large, further exploration and development will probably have to await a general peace throughout the region.

Biggest project still moving ahead is the Krk Island LNG-import

scheme. A multi-nation plan, for which no supplier has yet been firmed up, the project will also have to await peace for full-scale implementation. For, besides Slovenia's offtake, it would supply 400 MMcmcy to Croatia and 300 MMcmcy to Bosnia, 1 Bcmcy to the Czech Republic, 1 Bcmcy to Slovakia and 700 MMcmcy to Austria. French, German, Italian and Polish companies have also expressed interest. Kellogg's initial study costed the project at \$1.33 billion in 1991, with \$500 million for two 125,000-cu m LNG carriers; \$510 million for the terminal and regasification plant; and \$320 million for the 400-km pipeline system required to distribute gas to buyers. In February 1993, OMV, acting on behalf of all participants, placed the design contract for the terminal with Tractebel Industrie.

Bosnia-Herzegovina

Although Bosnia's Energoinvest is involved in the above LNG scheme, its participation is largely academic given the war now raging throughout Bosnia. The only other gas supply has been cut, while oil supplies, from the Adria-fed refinery at Bosanski Brod, are unobtainable because of the fighting. In theory, the refinery – just across the border from Croatia – should be getting crude. But the region is being fought over, while the Croat support of Bosnia seems to be falling off in some places. Oil is thus available only via relief convoys.

With only a few miles of its own coastline, Bosnia will always be totally dependent on its neighbours' goodwill. If an accommodation can be forged with Croatia, the republic will be reasonably secure. But the Vance-Owen plan for 10 autonomous provinces poses great difficulty. Any pipeline will have to run through several provinces, each of which – on present evidence – will be only too keen to blackmail its neighbours.

Macedonia

Totally landlocked, Macedonia is wholly dependent on neighbours' goodwill. Getting gas from Serbia, and oil from there, Greece and Bulgaria, the republic is currently

caught in a cleft stick. Sanctions mean that trade with Serbia is illegal, while the very name of the country causes offence in Greece. As a result, oil supplies from Greece have been erratic and international recognition of independent status is held up. Only Bulgaria can be seen at present as a reliable energy source.

State oil company Makpetrol has thus looked east to secure energy supplies. Under a deal signed originally with the USSR, but now taken over by Russia, a 100 km gas pipeline will run from the Bulgarian



INA-Naftaplin uses semi-submersible 'Zagreb'. Air attack has, however, severely curtailed what should be a highly promising search.

border to Skopje, to carry 800 MMcmcy supplied by Gazexport. Work began in January 1993, with completion set for April 1995. Much of the \$58 million cost is covered by Soviet debt settlement, with the balance coming via credits. While that will effectively end Macedonian reliance on Serbia for gas, the oil-supply situation remains fraught. Greece last year lifted its intermittent embargo on crude supplied via Salonika, but tension remains.

Serbia and Montenegro

As the rump Yugoslav Federation, Serbia and Montenegro have been virtually isolated by the UN trade embargo. As a result, the only reliable sources of oil and gas are the 1 million t/y of oil and 900 MMcmcy of gas produced mostly from the autonomous province of Vojvodina. That province, however, is heavily

peopled by ethnic Hungarians and is seen by Belgrade as less than totally reliable. So central control was tightened last year, as it was in Kosovo province, where the population is mostly Albanian. Within Serbia proper, lignite is almost the only indigenous energy source, while Montenegro has nothing.

Croatia's cutting of the Adria Pipeline left Serb refineries dependent on local crude from Vojvodina, plus whatever could be obtained by blockade-running. Gasoline rationing was the most obvious effect. But downstream, most oil-dependent industry has suffered badly, with petrochemical plants closing down entirely. Gas supplies from Russia have also been shut off. The latter comes via Hungary and, as long as Vojvodina does not cause friction, would be restored once peace reigns. But oil is different, the violence in the wake of Croatian secession leading to a re-awakening of long-dormant antagonism. So, early in 1992, plans were put up for a new oil pipeline, from the Montenegrin port of Bar to Belgrade, where it would feed 200,000 b/d to the Pancevo refinery. Cost would be \$300 million, but supply would depend on sanction lifting.

State oil firm Naftagas has also stepped up exploration and development. It is hoped that Vojvodina output can be doubled this year. Economics don't really matter as long as secure supplies are obtained, so even very small fields are being brought on stream. Also well on its way to completion is a major new gas grid, to handle 4.5 Bcmcy. This would be based on the Belgrade-Nis axis, with branches feeding other towns. Completion is set for 1995, when 10.5 million t/y of local coal would be replaced. But supply is again dependent on sanctions being lifted.

Serbia also has another problem, of longer standing. Its ability to pay for imported oil and gas is questionable, given that development is way behind the more sophisticated economies of Croatia and Slovenia. Macedonia, although untouched by conflict, may also have problems, while Bosnia.... ■

No change yet to UK budget provisions

By Carol Reader

Last month Petroleum Review detailed the provisions of the UK Budget, including fiscal changes governing oil and gas exploration and production in the North Sea (see Petroleum Review, April issue). These changes came as a bolt out of the blue to the companies and organisations concerned.

Now that everyone has had more time to study the implications of these changes, particularly where they relate to Petroleum Revenue Tax (PRT), it is apparent that while some companies benefit, others are definitely on the losing side. Since the changes were announced on Budget Day, those companies that reckon they will lose under the changes have been vociferous in campaigning against the proposed new tax regime. When the Finance Bill was introduced into Parliament on 14 April, no amendments were included. The Treasury intends to stick to what it first proposed – whatever anyone might say. However, lobbying continues and some believe that progress will be made.

In the long term the consensus is that the North Sea as an exploration province is going to lose a considerable part of its attraction and companies will channel their interest to other parts of the world.

The proposed changes, announced in the budget in March and subsequently confirmed in the Finance Bill, state that:

- PRT is to be abolished (including PRT on tariff income) for fields given development consent (Annex B approval) by the Department of Trade on or after 16 March 1993 (PRT exempt fields).
- Exploration and appraisal relief (E&A) is to be abolished for expenditure incurred on or after 16 March 1993.
- Existing fields (those given Annex B approval before 16 March 1993) continue to be subject to PRT but the rate of PRT will be reduced from 75 to

50 percent.

- No Tariff Receipts Allowance is now to be given in respect of tariffs received from a PRT exempt field.
- Rules apportioning expenditure between fields are to be modified where one of the fields concerned is a PRT exempt field.
- Cross field allowance to cease in respect of new fields given development consent after 15 March 1993.

The Chancellor of the Exchequer, Norman Lamont, maintained that the changes are part of the government's wider fiscal policy to simplify and reduce taxation. It is also government policy, he said, to promote efficiency and leave the rewards of the entrepreneur in his hands with less tax. This interpretation is viewed with great scepticism by many in the UK oil industry.

However, despite all the shouting and complaining, there are winners. One such is BP. At the company's AGM held in London last year, Robert Horton, then Chairman, made a strong plea for a reduction of PRT. Tax payments of £755 million to the British government coincided with poor financial results from the company. His prayers have been answered – with the reduction in the rate of PRT on existing fields, BP as a major producer in the North Sea will see its tax bill slashed – perhaps by as much as £140 million, according to one analyst. In the current climate this would give a significant boost to BP's profits.

David Simon, BP Chief Executive, has welcomed the budget proposals and is delighted that his company's

tax bill is to be reduced. At the same time he has pointed out that the new fiscal regime will encourage efficiency and promote enhanced recovery techniques from large existing fields because it will lead producers to extract the last proverbial drop of oil from those fields.

Chevron is another company which stands to benefit from the reduction in PRT from most of its producing fields over the next few years. Like other companies in the same position, Chevron will be reviewing its operations to see whether there are opportunities to boost recovery from existing fields. The development of its Alba field should also benefit from the PRT reduction, when the field eventually starts to pay the tax.

However, Chevron is likely to suffer from the loss of allowances, especially exploration and appraisal relief, which will mean a four-fold increase in exploration costs.

All companies share Chevron's concern at the retrospective character of these budget provisions – those drilling wells in future are now subject to the revised tax regime instead of that applying when the drilling obligation was taken on. Other companies will wholeheartedly agree that the cost of finding new fields has escalated sharply. What is more they worry that the government, having made radical, retrospective changes to the tax structure on one occasion, might again entertain more revisions at another future date, when it is looking for an extra source of new revenue.

'In an industry where investment decisions are taken about long-term projects, such a dramatic change to the

tax regime is particularly worrying. The industry is now concerned that PRT may be abolished before significant costs of abandonment are incurred in the next century,' said Malcolm Naylor, Tax Partner, Arthur Andersen Energy Group.

Chorus of opposition

Amerada Hess headed the drive against the Chancellor of the Exchequer and his radical proposals, with particularly forthright statements. 'Far from providing a boost for the UK oil and gas industry as suggested by the Inland Revenue, the recent Budget proposals will seriously damage the economic viability of exploration for oil and gas in the UK', said one press release. An Amerada Hess spokesman maintained that the future development of the whole UK Continental Shelf was being put at 'severe risk'.

While exploration costs generally would be quadrupled, the economics of small fields, in particular, would be adversely affected. The company was especially incensed that no prior consultation took place and that the provisions were retroactive.

Amerada Hess believes that the result of the tax changes will be:

- Sharply reduced exploration
- Fewer small fields developed
- Reduction in jobs
- Exploration activity would be directed elsewhere
- Less long-term tax take as a result of less production
- More imports of oil and gas in the long term
- Shrinking of the independent oil sector
- Loss of technical expertise from United Kingdom
- Satellite developments will face higher tariffs following the removal of tariff receipts allowance.

Other companies voiced similar concerns, as did the Association of British Independent Oil Companies (BRINDEX), speaking on behalf of the majority of its 19 members. The main concern of BRINDEX members centred on the proposal to abolish E & A relief, describing the new regime as 'punitive retroactive taxation'.

Indeed, a number of commentators have pointed out that the withdrawal of E & A relief is not the withdrawal of 'subsidy', given that it was one of the few reliefs that broke down the high tax environment in which companies operate in the North Sea.

In 1991 expenditure on

exploration and appraisal drilling totalled some £1.95 billion for some 187 wells drilled, according to the Arthur Andersen Energy Group. In 1992 only 132 wells were drilled and the forecast for 1993 was 119-151, representing expenditure of some £1.2-£1.6 billion. According to Arthur Andersen, if this sum were spent in each of the next three years, the estimated loss of E & A relief would total some £2.4 billion, resulting in an overall cash flow loss to the industry of about £700 million.

Job losses

Critics of the Chancellor's budget provisions point out that thousands of jobs are likely to be lost, if North Sea exploration takes a downturn as a result of the proposed tax changes. Estimates of the number of job losses have been given, varying between the government's own figure of 10,000 and rising as high as 39,000. This would affect both offshore workers and shore-based support personnel in service companies, manufacturing and construction.

Also at risk because of the loss of E & A relief is the government's 14th licensing round. Opponents of the tax changes say that they will be forced to rethink their commitments to explore. It was likely that applications for the current licensing round would be hard hit, with companies no longer so interested nor willing to participate. Moreover, the mere fact that a measure of uncertainty has been introduced into exploration is a disincentive in considering whether to take on further commitments. A number of companies are reported not to be willing to take up the licences they have been offered.

A particular instance of the new uncertainty involves obligation wells. When a company is awarded a licence, it undertakes to drill a specific number of wells. In the past it has always been understood that these undertakings were made on the assumption that the tax laws would not be changed. Now the government appears to be changing the tax regime after the award of the licence but before the drilling has been carried out – an unheard of practice which some might even claim was illegal.

To date the government has not agreed to take heed of many companies' loud protestations concerning this state of affairs.

In the past companies active in the North Sea have spent much time and effort in studying and creating tax-

efficient operations and groupings, in order to take advantage of the tax system. A number of deals were made whereby mature operators sold oil and gas assets to those seeking a PRT shelter. BP was instrumental in originating these deals when it disposed of its interests in Forties and Magnus during the 1980s. Other companies made similar, often complicated, deals. Mr Lamont has at a stroke apparently destroyed the whole infrastructure on which these deals were based. ■

Ernst & Young Survey

After the budget changes were announced Ernst & Young commissioned a survey of companies which drilled North Sea exploration wells in 1992. A high 96 percent response rate was obtained.

The main conclusions of the survey were:

- The withdrawal of E & A relief was regarded as the biggest issue and was likely to have the biggest impact on future plans. It was also the measure which respondents would most like to have changed.

- Over half of the respondents believed that the budget changes would lead to incremental investment in existing fields, technical innovation and cost cutting. However, only 26 percent thought that it would promote new field development.

- All respondents expected the number of wells to decrease in the future, while commitment to the 14th round has diminished.

- A clear majority stated that the attractiveness of the United Kingdom for future investment had diminished and exploration was expected to decrease as a result of the budget.

- Virtually all respondents expect a decline in the numbers of personnel working in the UK offshore industry.

- When questioned concerning the number of wells likely to be drilled this year, over 40 percent believed that activity over the next 12 months will be less than half of the 1992 activity. Above all, the replies showed that companies had become accustomed to 'stability' over the last 10-15 years. This was a critical factor – because of long lead times, they want/need stability, especially fiscal stability, in order to formulate their long-term plans.

Coal's future in the balance as gas gets the go-ahead

By Robert McLeod

The future of the coal industry in the United Kingdom hangs in the balance as the government's White Paper fails to guarantee long-term markets for coal-fired power generation. Increasingly stringent environmental legislation has assured a place for gas-fired generation in the UK market and the go-ahead for new projects given in the Paper will continue to make inroads into traditional coal markets. The transition to gas as the fuel of the 21st century now looks unstoppable.

The government's review of the coal industry has given a reprieve to 13 of the 21 pits earmarked for closure while six pits are to go on care and maintenance and two are to face closure as reserves become exhausted. The cost of the programme to keep the pits open has been estimated at £400 million while £200 million has been earmarked for regeneration packages for mining communities.

While ensuring the survival of at least some of the pits and placating most of the backbench rebels who threatened to vote against the beleaguered government, the review has held out against the option of reversing the development of UK gas reserves.

In a statement made by the President of the Board of Trade, Michael Heseltine, to the House of Commons, the government announced that it is prepared to subsidise the difference between the world market price for coal and the cost of British Coal's production. The subsidy will apply to any additional tonnage the company can supply over the 160 million tonnes already negotiated over the next five years. Private sector mines will also be able to get government backing for additional tonnage sales.

The White Paper also stressed that the government would continue to support research into new coal technologies and is to provide 'extra money' for the Coal Research Establishment. The government is to increase the funds available to research organisations investigating

topping cycle technology and other improved firing techniques from £3 million a year to £7 million a year for the next three years.

As the United Kingdom has agreed to limit the release of sulphur dioxide and nitrogen oxides from power stations there is increasing pressure on coal-fired technology to improve its efficiency and environmental performance. The White Paper, while stating that its proposals would not threaten the United Kingdom's ability to meet the targets, recognises that environmental constraints in the longer term could restrict the amount of coal that can be burnt in the United Kingdom.

The White Paper was dismissed as 'unclear and opaque' by former British Coal Commercial Director, Malcolm Edwards, who added that the 'underlying structural problems remain in place'.

'It is difficult to see how these reprieved pits will last two years'

'No outline solution or plan about what to do with the supplementary tonnage has been put in place. The generators were prepared to do a deal in relation to the package suggested by the Select Committee, not on one single piece of the package,' he said.

'It is difficult to see how these

reprieved pits will last two years. With the gas powered generator coming on-stream, Sizewell coming into full operation and the retention of the ageing Magnox reactors, the future for coal in this country looks bleak.'

Mr Edwards was particularly scathing about the retention of the Magnox reactors. It is, he says, leading to a nuclear version of the coal problem in around five years time. The reactors, operating beyond their intended life, will reach a stage where their shutdown will become 'unavoidable just when it becomes unmanageable'.

He dismissed the prospect of generators fitting expensive environmental protection equipment to their stations and the chances of any new plant being built are, in his opinion, 'zero'.

'The coal industry has lost hands down,' he said.

The continuing decline in the coal-fired power market was reinforced by the decision by National Power, shortly after the White Paper was published, to shut two further power stations.

The 1,022 MW coal-fired West Thurrock power station in Essex is to close with the loss of 330 jobs. The station, which ran mainly on imported coal and is over 30 years old, was operated as a mid-merit station and did not supply base-load electricity. The 224 MW oil and coal-fired Padiham station in Lancashire is also to shut with the loss of around 70 jobs. The oil unit at the station had been mothballed since 1991.

The decision to close the stations was taken in the face of flat demand for electricity and the mounting over-capacity with increased production from the nuclear stations and a number of gas-fired projects coming on-stream.

In a move seen as placating the nervous gas market, Mr Heseltine reinforced the government's intention not to interfere with the existing power station consents or alter the policy for taking future consent decisions under Section 36 of the Electricity Act 1989.

Enron Europe Vice President, David Lewis said that although he didn't feel the subsidies would unduly affect the gas industry as they are strictly limited to five years, it was a 'little difficult' to understand what the White Paper actually means.

'They are going to subsidise additional coal,' he said, 'but we do not know what volume.'

Enron are still progressing with plans for an additional power station in the United Kingdom and have held discussions with gas suppliers and power purchasers.

In a move which will ensure the development of the Liverpool Bay sour gas projects, the go-ahead has been given for the Connah's Quay power station development in North Wales.

The Connah's Quay project, to be undertaken by Powergen, is a 1,360 MW gas-fired plant on the site of a demolished coal plant. A spokesman for Powergen said that it would be at



Mining communities will be hit hard by pit closures and some of their more famous institutions, such as the Grimethorpe Colliery Band, may well disappear.

least three years before generation could be started up from the first phase of the development, due to begin in the summer. Around 40-50 jobs operating the plant will be created in the long-term. A typical 1,000 MW coal-fired plant supplying base load electricity utilises 2.5-3 million tonnes of coal a year.

The gas for the plant will come from the Hamilton and Hamilton North fields, operated by Hamilton Oil in partnership with LASMO and Monument Oil and Gas, which contain reserves of around one

trillion cubic feet of high sulphur gas.

The 300-strong project team was stood down last year after planning delays and the company is 'moving swiftly' to reassemble the team and begin work on the infrastructure, including pipelines, platforms and the terminal at Point of Ayr, so as to be in a position to deliver first gas in 1996.

Further consents were granted to two smaller projects. One involving sour gas at Ryedale in North Yorkshire and a combined heat and power scheme at Aylesford in Kent.

Enron's gas fired plant comes on line

The completion of the Teesside Combined Cycle Gas Turbine power station in a world record 29 months represents the first large combined heat and power project of this size outside the United States and the beginning of what the operators believe is a fundamental change in the way countries generate energy requirements.

Equity in the £795 million plant is held by Enron Europe (50 percent), Midlands Electricity (19 percent), Northern Electric (15 percent) and South Western Electricity and South Wales Electricity each holding eight percent. ICI has an option to purchase a 10 percent equity share from Enron.

The environmental aspects of the plant are crucial to the success of gas fired plant, according to the company.

Emissions of sulphur dioxide will be eliminated, nitrous oxides emissions cut by up to 90 percent and carbon dioxide emissions halved when compared with most coal-fired plant.

According to Teesside Power Ltd, the joint venture company which will run the plant, without gas-fired

power generation Britain will not fulfil its environmental commitments made under EC and Rio Convention regulations and guidelines.

The success of the plant also lies in its ability to be sited near to where the energy is required.

The plant occupies a 23 acre site close to the ICI polymers site which will purchase steam as well as 257 MW of electricity. A coal-fired power station of similar capacity in Cheshire is located on an 820 acre site.

Although no Section 36 application has been made by Enron International, Chairman Robert Kelly says the company is in an 'advanced stage' of discussions with gas suppliers and electricity purchasers. He declined to say where a new plant would be sited but the company is keen to establish Teesside as its industrial base in the United Kingdom.

Enron's Seal Sands gas processing plant processes 300 million cubic feet of gas a day producing 700 tonnes of gas liquids.

This is due to be increased by a further 300 mmcf a day when it comes ashore in 1996.

Kelt Energy plc welcomed the announcement for the go-ahead for the Ryedale scheme. The consent will allow Kelt – which holds a 60.5 percent interest – and its partners; Teredo Oil (14.25 percent), Tullow Oil (13 percent) and Edinburgh Oil and Gas (12.25 percent) to develop the Ryedale fields, discovered between 1983 and 1992.

The fields will be tied by a gas gathering pipeline system to a gas treatment and 50 MW power generation plant at Knapton from which electricity will be exported to the grid. Gas consumption is expected to be 10 million cubic feet of gas a day.

The plant is expected to cost around £30 million to construct and should create around 200 jobs in the short term and 15 long-term jobs. Kelt hopes to continue its policy of recruitment from the local community. The project is due for completion in early 1995.

The building of the plant will encourage the further exploration of the minor gas province. Kelt and its partners have a number of licence holdings in the area and intend to drill wells at Horndean in April, Hambly Grove in May and Singleton

in July. There are contingent plans to drill a further onshore well at Caythorpe in November. Scottish-Power, which will design, build and finance the gas gathering pipelines, processing and generating plant, will purchase any additional gas reserves found in the area

'The government hopes that electricity companies in the United Kingdom will, in future, be given the chance of exporting electricity to Europe.'

National Power has also been given the go-ahead for a 38 MW combined heat and power (CHP) plant for SCA's Aylesford paper-making site in Kent. National Power Cogen claims an efficiency of 85 percent for the scheme compared with about 36 percent for a large coal fired power station. The plant, National Power's largest CHP scheme, will run on natural gas and distillate oil.

On the subject of Orimulsion, Mr Heseltine said that the government could not interfere with existing contracts. He added that he had been ensured that future deliveries would be kept at current contract levels and the environmental considerations would be monitored by Her Majesty's Inspectorate of Pollution. As an oil-based fuel it will bear the same rate of duty as heavy fuel oil.

The government also feels that it cannot legally act on the level of imports on French electricity through the cross-channel interconnector. Doubts have been expressed recently, however, over the safety on a number of French nuclear reactors. It hopes that electricity companies in the United Kingdom will, in future, be given the chance of exporting electricity to Europe through the system.

While electricity exports in the long-term could strengthen demand, the overcapacity already in the market, the increasing attractiveness of gas fired generation and the government's commitment to 1,500 MW of – albeit marginal – extra generating capacity it could still be too late for coal. ■



WORLD PETROLEUM PERMANENT COUNCIL AND WORLD PETROLEUM CONGRESSES

FOUNDED IN 1933

ADVANCED MANAGEMENT SEMINARS 1993

12–16 July and 13–17 December

at

THE INSTITUTE OF PETROLEUM, LONDON

These new development seminars are aimed at high potential middle management in the petroleum industry worldwide. They include visits to Shell Centre, BP Headquarters, the International Petroleum Exchange and training sessions in the IP by the Corporate Consulting Group, British Gas, Kellogg/Dresser Industries, the IEA, COGES, Energy Information Services and Petroleum Argus. Topics include The Work of the Institute of Petroleum, WPC and the World Energy Council, Oil Supply and Demand Overview, The Pacific Basin, Russia/CIS, The Middle East and OPEC, the International Energy Agency, Environment, Health and Safety, Quality Management, Supply Negotiating Skills, Changing Industry Structures, Personnel Policies, New Technology, Investment and Finance, The Key Current Public Issues.

For full details please contact Mrs Julie Chapman, WPC Seminar Officer, 61 New Cavendish Street, London W1M 8AR, UK. Tel: 071 636 1004 Fax: 071 255 1475 Telex: 264380

French policy on bio-fuels

By Stuart Todd

'The only argument in favour of bio-fuels is agricultural. As far as contributing to the protection of the ozone layer and lessening dependence on fossil-based energy is concerned, their impact is negligible.' This was one of the major conclusions to come out of a French government-commissioned report recently published.

In September 1992, the then French Prime Minister, Pierre Bérégovoy, appointed former Renault chief, Raymond Lévy, to 'study the conditions which would allow for growth in the competitiveness of "Diester" (bio-fuel made from rape seed) in relation to diesel oil and to bring out the energy potential of sugar beet and its derivatives.'

Changes to the Common Agricultural Policy, CAP, provide the context for the French government interest in bio-fuels. Some 15 percent of cultivable land in France must now be left fallow, the equivalent of 1.5 billion hectares. Anxious to placate the powerful farming lobby in France which has already demonstrated a vehement opposition to the reformed CAP, the government has looked for a solution in using fallow land to produce rape seed and sugar beet crops for energy purposes.

Bio-fuels have been made exempt from an excise tax on petroleum products. A FFfr25 million subsidy (FFfr1,000/hectare) has been allocated this year in order to make rape seed cultivation on fallow land an attractive proposition to farmers. A national bio-energy agency is to be set up with agricultural research body, l'Institut National de la Recherche Agronomique, the state environment agency, Agence de l'Environnement et Maitrise de l'Energie, l'Institut Français du Pétrole and industrial groups, among them Rhone Poulenc and Elf Sanofi, destined to play an important role. The agency will oversee a state/industry-funded R & D programme over the next three years, totalling FFfr52 million which is to target the development of rape seed cultivation and the production of Diester.

The French government was left disappointed if it expected the Lévy

report to add economic and scientific weight to bio-fuel development as a 'quick fix' solution to the reformed CAP and a disgruntled farming community. The report recommends that development 'only be considered as part of an on-going R & D effort whose objective is to realise the full competitiveness of bio-energy production over a period of several decades'.

'Changes to the Common Agricultural Policy provide the context for the French government interest in bio-fuels'

In choosing between two development paths, the report does not hesitate in favouring rape seed methyl esters 'which do not present any technical obstacles and less need of subsidies than ethanols.' The direct use of the latter as a fuel additive is discouraged 'except for operations strictly limited in scope.' However, the report does not close the door completely on ethanols claiming that 'the total or partial replacement of MTBE (Methyl Tertiary Butyl Ether) by ETBE (Ethyl Tertiary Butyl Ether), to improve octane ratings, is feasible.' Moreover, it recommends modification to the CAP to allow sugar beet cultivation on fallow land.

Both Elf Aquitaine and Total have on-going ethanol development programmes. Elf has favoured a technique of integrating ethanols by means of a 10 percent ETBE additive in unleaded petrol. An MTBE unit at its Feyzin refinery, near Lyons, has been converted for ETBE production.

Elf expects to sell 1 billion litres of unleaded petrol this year containing 50 million litres of ethanol.

Total has tested the direct incorporation of ethanol (5 percent additive) in petrol, piloting it at 40 service stations in the Reims area of France.

However, attention has now turned to the ETBE technique. Total is currently in negotiations with ethanol producers for the construction of a FFfr150 million production unit at its refinery at Gonfreville in Normandy which could accommodate up to 300,000 hectolitres of ethanol annually.

On the financial aspects of bio-fuels, the report calculates that the cost price ratio between petroleum and bio-fuels is 1:3 or even 1:4. 'However, we cannot exclude, in the mid and long term, a doubling of petroleum prices.' As for bio-fuels, Mr Lévy expects the fruits of research over the next 10 to 15 years to lead to a 30 percent increase in productivity gains, thus reducing the cost price gap significantly.

The report states that financial aid for bio-fuels development should be accorded 'case by case' in the form of contracts between government, producers and end-users and warns against the implementation of any 'general, EC-wide, fiscal measure.'

The publication of the report coincided with a draft agreement signed by the French Ministries of Energy and Agriculture, bio-fuel producers and Elf and Total. This sets limits on the volume of bio-fuel additives to be incorporated in diesel oil production over the next three years. This year, the two oil companies will accept 40,000 cu.m. of bio-fuel made from methyl esters and destined for vehicles used by municipal authorities which can absorb additional costs more readily

than the average consumer.

Volume will rise to 140,000 cu.m. in 1995, the equivalent of 0.65 percent of annual French consumption of diesel, a figure in keeping with the Lévy report, which advocates a substitution rate of 1 percent by the year 2000.

However, the government's overall objective is 5 percent (1 million cubic metres) which would utilise over 50 percent of fallow land. Total and Elf are also to promote Diester among municipalities as part of the agreement. Total currently supplies diesel which contains 25 percent of 'Diester' to a fleet of 120 vehicles run by the Ville de Paris while Elf has led a similar initiative with the *département* of Loire-Atlantique in western France. Around 30 French cities are already experimenting with bio-fuel from rape-seed origins.

French 'Diester' manufacturer, Sofiprotéol, is banking on the industrial-scale production to improve the fuel's price competitiveness in relation to diesel. 'Over

the next two to three years, we are looking to reduce the cost price for 'Diester' to between FFr3/litre and FFr2.6-2.7/litre on the basis of 350,000 tonnes per year (tpy) output'



Photo courtesy of Elf

explained Philippe Tillous-Borde, General Manager of Sofiprotéol.

An annual production capacity of 500,000 tpy is forecast by 1997 at an investment cost of FFr500 million with 50 percent being met by regional government authorities and user-firms.

A cost price of around FFr3/litre

for a tax-exempt 'Diester' in the near future compares with FFr0.90 (FFr2.62 with tax included) for diesel currently. Sofiprotéol sees a heavier tax on diesel as one solution in

bridging the gap still further in the short term. 'Today, the difference in the sales price between petrol and diesel-driven cars has disappeared', claims Mr Tillous-Borde. 'This means that the lower tax on diesel (FFr1.71/litre compared with FFr2.79/litre for unleaded and FFr3.17/litre for leaded petrol) can no longer be justified.' He points to the huge loss in fiscal revenues as a result of this policy, aggravated by strong growth in diesel consumption in France (+7 percent in 1991). Some support for this

argument can be found in the Lévy report. 'In contrast to other European countries, France has promoted the use of diesel by a tax greatly inferior to that imposed on petrol. It would be paradoxical if this proved harmful to the development of methyl ester which is the least costly form of bio-fuel'. ■

THE BEST FIRE TRAINING IN THE WORLD

BOOKING NOW FOR

- CHEMSAFE TRANSPORT EMERGENCY RESPONSE (3 DAYS)
- HANDLING OF EMERGENCIES IN THE PETROLEUM INDUSTRY
- PLANNING FOR EMERGENCIES AND INCIDENT CONTROL

To discuss how we can meet your training needs contact: Ron Cameron, Marketing Manager,
Tel: +44 (0)608 52156, Fax: +44 (0) 608 51788

NEW BROCHURE
OUT NOW



THE FIRE SERVICE COLLEGE

MORETON-IN-MARSH ENGLAND

New outlook on Europe from Mobil House



Geoffrey Cardinal's appointment as Chairman, Mobil Oil Co. Ltd., on 1 January coincided with the arrival of the Single European Market. However, the reorganisation of all of Mobil's operations on a European basis started back in 1990.

This reorganisation comprises three parts: firstly, the formation of Mobil Europe Ltd to coordinate all European operations; secondly, the establishment of standardised Europe-wide business processes and thirdly, the reorganisation of the company's business along functional lines.

In an interview with *Petroleum Review*, Mr Cardinal explained what this concept of functionalisation means, how it differs from other companies' approach to Europe and the benefits to be derived from it.

Carol Reader: Does your appointment represent a new strategy for Mobil?

Geoff Cardinal: Yes. While we cannot have one European company because the legal framework does not exist, what we certainly can do is to operate more and more as one company across Europe. This means that we have got a change in the structure in the sense that some of the people in our organisation in the UK company take much stronger guidance from the Vice Presidents of our European operation than previously.

Now it is important to recognise the way that we have done that. The European Vice Presidents of fuels and lubricants, for instance, have come onto the board of the UK company. So the fuels manager or the fuels director and the lubes director for the UK company report in that board structure to the Vice President for Europe who is also on the board.

What you are trying to do is to create separate profit centres for those three key business activities – the refinery, the lubricants business and the fuels business. We will look at those as separate P & L centres within the umbrella of Mobil Oil Company Ltd., the UK company.

So for our own management information systems we see our company very much as independent profit centres. And from the

European prospective there will be more commonality in what we do across Europe. So we maximise on the benefits of being part of a European operation and we are already seeing it.

We have an endless stream of examples. We look at purchasing underground tanks Europe-wide; we look at purchasing canopies Europe-wide; we do all the engineering drawing here in the UK for most of the service stations across Europe.

You see that we are looking at where we can pull things together to get economic economies of scale and benefits from operating across Europe.

Does the diversity of all the countries in Europe cause problems?

It causes some problems and there are some cultural differences that we can't afford to ignore. This is why we still have independent affiliate structures. We have what in our terminology we call country managers which in the UK is the position of Chairman of the Board and in France it is President of the company. The role of that position is to make sure that in the changes we're making we actually do that sensibly and that we do at the same time have an umbrella which pulls the local team together and makes the local team work as one team within the national environment. You can't ignore that – it provides the check

and the balance in the system.

Here is a classic matrix organisation. You've got functional guidance and the different lines – fuels, lubes and the refinery. You also have a cross-functional management team operating in each country. The two legs are important – you cannot just have the one stovepipe organisation; you've got to have the cross beam as well. And that actually caters for some of the local cultural differences. My own experience in Cyprus, Austria and the UK has shown up the very different environments.

Has the restructuring brought greater internationalisation?

Maybe it hasn't happened yet but I think it is going to happen. I think the oil industry is used to moving people around. I think that we're now going to see more potential moves at probably lower levels in the organisation. Whereas we have tended to move people around at very senior positions, we may well see people moving from middle management levels, and, lower down the organisation, from one fuels operation to another fuels operation. Then there is an interchange of ideas, interchange of strategies between the companies.

We have a tremendous depth and wealth of talent in our UK company. I would expect that we'll see more of those people being exported to other countries in Europe to work. And

we'll see people coming into our company from the rest of Europe. This is the Europe of the future.

Has the reorganisation meant a reduction in staff numbers?

Yes because obviously if we look at it coldly and logically, the reason we're doing it is to make ourselves more efficient, to get the economies of scale Europe-wide. Previously there was duplication of effort. If we can do away with some of that duplication and make ourselves more efficient, then we'll survive. If we don't, we won't be competitive. Fact of life.

What are your other priorities in your new job?

One priority is to make this new structure work. To make the new structure of the UK company a more integrated part of the European organisation. To do that means that you've got to build a strong team which works well together. It also means that you have to develop down through each of the organisations common operating standards in all the areas of management training, the way we approach quality in the company and the way we respond to environmental pressures.

I guess my priority is to maintain the motivation of employees in all of the individual teams within the company. I aim to put the best management practices and the training in those management practices down through all levels of the company in all three principal areas. I want to make sure that we do that in a consistent way because we get the opportunity to move people from function to function. We do not want to create three separate companies, a refining company, a lubricant company and a fuels company. So movement of people between them is important.

Is compliance with the constant stream of new environmental regulations an alarming financial burden?

Yes. It's a worrying financial burden because the earnings in the downstream oil industry in the UK and in Northwest Europe are simply not there. While you've got surplus refining capacity and therefore no good refining margins, which overwhelm the profits in marketing the products so that you end up with unsatisfactory earnings in the total business, then any significant additional investment burden is difficult. Some of the burdens on us are frankly unacceptable in terms of what the industry can afford.

It obviously affects everyone. Is that no great comfort to you?

It is no great comfort because the total industry cannot afford it. Everyone in the industry is in the same position.

The worst example is all the discussion on Stage II at service stations. If that materialises, then the industry is faced with investment in Stage II, costing £500-600 million. We simply cannot see that this is justified because it is not efficient relative to other solutions to the problem of vapour recovery at service stations, ie the large carbon canister which has been proved to solve 95-97 percent of the emission problem. The solutions proposed to the sealed system at the actual pump are inefficient – we know that – they perhaps collect 55-60 percent of the vapours. They are inefficient; they are very much more expensive and a direct cost burden on us as an industry.

It is very easy for people to say recover the cost in your prices – government has a habit of saying that.

But in a sense there is still a long-term damage to the industry in Northwest Europe and it's true of a lot of the environmental legislation that, in a sense, if we apply it in Europe more stringently than countries around the periphery of Europe, then a lot of the investment will flow to those countries, particularly in refineries, rather than here.

While the industry is not earning a satisfactory return, it is not the time to do things which are not proven to be efficient; we should implement all legislation that is proven to be efficient and which we know works with a sort of 'no regrets' measure. But not things that we're not yet sure about.

Mobil is a pioneer of bottom loading. Don't you already collect vapour during tanker loading?

Yes, we believe that we should close the system through our terminals to our service stations and we're working very hard on that because it makes economic sense.

There's a health incentive to do that.

There's a large potential problem in terms of what you can address cost effectively but the impact of the pump is a very small part of the problem in terms of emissions – refuelling is responsible for 5 percent of the vapour emissions. Most of the vapour emissions come from the running of the car. What we are saying is that Stage II is not cost effective. You're throwing a huge amount of money into a tiny part of

the problem. If you threw half of that amount of money at putting the large carbon canister on the car, you would not only solve the refuelling problem, you would also solve the bigger problem which is the emissions caused from running. Somebody's got to look at the totality of this and not simply implement everything that is technically feasible. If we implement everything that is technically feasible, the burden on the industry and therefore on the motoring public will be enormous.

Looking at the retail side of the business, do you think that it will emerge from the current recession in a more streamlined and cost-effective position?

Yes, I think you can see some of that from the data the Institute has just published. There is rationalisation. We see ourselves as more efficient. We are able to supply our customers through bigger and better service stations through our investment programmes and through rationalisation. This is very important to us because quality of service is the driving force of our whole organisation.

Does Mobil concentrate its retail business in urban areas?

Generally speaking Mobil operates in the larger semi-urban areas. We are already highly concentrated where the major markets are. We have done that consciously over the last 20 years. We have looked at the efficiencies of our business so that we can have larger trucks delivering, so that we can have a closed system in terms of vapour recovery and that we can have throughput in sites where we are able to invest in better facilities for our customers. That is something which has made us more efficient and more effective as a company.

Mobil and Esso are the two companies with the highest site throughputs. We in fact pump a lot more gallons than competitors of similar corporate size which must be a sign of efficiency.

Do you believe that the hypermarket threat is being contained?

I think we'll see more hypermarket sites develop. I don't know how many more but there will come a point when they will level out. I think that there is a place in the market for the hypermarkets alongside what we offer. They are offering a basic price and we are offering quality and service.

We are investing in facilities at service stations which, with one or

two exceptions, hypermarket sites don't offer. Our experience is that customers value the quality and service that we provide. Hypermarkets are competing for the same business as we are so I'm pleased that in fact motorists continue to want the quality and service that quality companies like ourselves can offer.

But if there is a supermarket service station close to a Mobil site, does it not damage your trade?

Damage is a strong word. In any local area there is only a finite volume of trade and we compete for that with any other operator including the hypermarket. History would suggest that it doesn't take all the business away and that we are still able to carry on with our quality/service philosophy which is attractive to a large part of the market. Motorists either want the cheapest price they can find in which they case they'll probably drive quite a long way to a supermarket or hypermarket site (which does not necessarily always make economic sense if they really worked it out) but a greater proportion of motorists, in our experience, wants the convenience that we offer in terms of the quality/service that's available, in terms of the shop that's there, in terms of the car wash that is there – these features are important and certainly the basis of our marketing effort.

We can quote a number of examples. For instance, at the service area at Chelmsford, you would think that being just off the A12 most of its business would be through traffic but in fact 70 percent of the customers are from the local Chelmsford area, although 200 yards away there is a large Sainsbury's. And we still do a very satisfactory business from our site.

I think it is fair to point out that we do a lot to build customer loyalty at our sites and generally we are very successful in maintaining that customer loyalty. The Premier Points promotion is a good example. We know from our research data that we have a very loyal customer base and that is very important to us.

What comments do you have on yesterday's budget?

I haven't had time to have a close look at it. The truth is that it is very difficult to separate the motorist from his motor car and even three percent per annum real increase in fuel motoring costs, which is what the Chancellor has laid out won't be enough to dent the usage of the motor car significantly.

Regarding the more dramatic increases, I find the levying of VAT

on domestic fuels a little bit depressing since everybody has been talking for the last year about 'energy taxes for environmental purposes' as being 'revenue neutral'. It would have been nice to see some of that revenue ploughed back into an investment in transportation or other revenue neutral projects. The Chancellor himself said that these are energy taxes and this revenue is going into the Exchequer as a result. That doesn't sound like revenue neutrality or fiscal neutrality to me. It is quite the reverse. I think it is slightly dangerous as a precedent when the rest of the world is talking, or the rest of Europe, is talking about 'fiscal neutrality', we seem to be using fuel taxes as a way of generating revenue.

The EC has said that, in principle, tax which is designed to reduce the impact on the environment or 'green taxes' should be fiscally neutral but we seem to be going a different way. I have some concern about that.

What characterises your approach to Europe?

One of the key words is consistency, consistency across Europe and consistency of standards across the business line when you are cutting it the other way. Consistency of standards and approach.

Across Europe, some customers like to pay for their petrol with cash, some pay with their credit cards, some use outdoor payment systems. Surely that means that you cannot have standardisation?

There are many things which we are doing – and now I speak from my old job – that we do here that we can equally do in other countries. Mobil

is developing a fleet fuel card – most companies have a fleet fuel card – but what we're making sure is that we're developing the systems that support that in a common way, so that they're applied in the same way in every country. The result will be that we can actually offer a card to a fleet operator in this country that he can use in every country in Europe and vice versa – that is very important. It is Europeanising that sector of the business. Now if we didn't do that, if we had individual affiliates developing their own systems for that fleet card, then there is no way that we could offer that customer service across Europe. It's a good example.

You already have a truck card don't you?

MDC. Yes and the fleet card replaces MDC and a Mobil card which will be usable across all of Europe. It is a good example of where three developing common systems for using the card means that you can actually offer it Europe-wide – so it's an upgrading of a customer service.

In the same way, although it is not customer related, our basic business systems, the accounting systems that we use, the types of invoices we produce, are being standardised across Europe so that in the end we may well have one accounting system for Europe with each individual company having its own sets of accounts but actually running on the same machine at our data centre in Maidstone for the whole of Europe. Because they're run on the same machine on the same system, then we do it once instead of 16 times for 16 affiliates. That's got to make sense. ■



LONDON BRANCH – ANNUAL VISIT

The 1993 Annual Visit of the London Branch will take place on

Thursday 17 June 1993 starting at 10.30 am,

*at Buncefield Terminal, Hemel Hempstead (near Junction 8, M1),
by kind permission of Shell UK Oil Limited. Lunch provided.*

This a major road and pipeline terminal with both top and bottom loading gantries and vapour recovery facilities.

Numbers will be restricted to 25 people on a first-come-first-served basis. Contact the Secretary, Edith Walker, on (0926) 404257.

Please note: Visitors must provide their own safety shoes which must be worn. Safety helmets are available on site.

Slow progress for power from renewables

By Robert McLeod

The development of renewable forms of energy for power generation has taken off in the United Kingdom due to the Non Fossil Fuel Levy – primarily used to support nuclear power. In the first two orders made under the levy, in 1990 and 1992, almost 200 schemes have gained approval ranging from proven technologies such as hydro-electric and waste incineration to the bizarre, including two operational, competitively priced schemes running on chicken litter. Despite the promise of all these schemes, progress is slow and the government's target of just 1,500 MW declared net capacity by the end of the century seems as distant as ever.

A report by the Renewable Energy Advisory Group has recommended far reaching changes in the application of the Non Fossil Fuel Obligation (NFFO) levy to promote the generation of electricity from renewable sources and to ensure the development of the technology to a competitive position by 2005.

Although the contribution of renewable sources to electricity demand is not expected to exceed more than five percent before the end of the century, the development of the technology now is seen by the group

as vital to the long-term interests of the relatively new industry. By supporting renewables in their infancy, the government could help to ensure British industry's technological advantage in the future.

Some renewables are economic in niche markets and the more established technologies, such as hydro and solar, have reached a level of technological maturity that has established their competitiveness in the generation market. The specific recommendations of the group are more concerned with the technologies

that still require extensive research and development expenditure.

The government is committed to underwriting, through the levy, 1,500 MW of additional declared net capacity by 2000.

In the first order in 1990, 75 projects were contracted of which 58 are now in operation producing a total of 102 MW of electricity. The projects were made up of 26 hydro-electric (11.6 MW total capacity), 24 landfill gas (35.5 MW), nine wind (28.4 MW), eight biogas (6.5 MW) and seven waste incineration schemes (86 MW).

The second order in 1992 contracted a further 122 projects with a total declared net capacity of 457 MW including 49 wind, 28 landfill gas, 19 sewage gas, 12 hydro-electric and 10 waste incineration schemes as well as four projects using other non-fossil fuels. Of these, 44 are already operating, producing a further 58 MW.

The third order is due later this year although no date has been set.

Wind struggles to gain the high ground

Wind power has frequently been cited by environmentalists as a clean and efficient energy source and Offer, under the Renewables Order, has sanctioned 58 schemes around the country. Hopes of wind power producing a significant contribution to power generation were high as development in the United Kingdom outstripped that anywhere else in the world.

The reality has proved somewhat different. By the end of 1992 only eight schemes were in operation and a further eight were at varying stages of construction. Of the 43 remaining schemes, less than half have received planning permission and many have little chance of being developed. The dominance of the turbines on necessarily exposed land has been the prime reason for the denial of planning permission.

Britain's first scheme, at Delabole in Cornwall, produces 4 MW of electricity from 10 turbines. Schemes currently under construction in Wales, however, consist of as many as 60 turbines. When all the projects around the country currently under construction are commissioned, more than 320 turbines will produce less than 100 MW – almost as much as one waste incineration facility.

Reaching the target

When the Department of Trade and Industry makes the announcement it will specify the expected generating capacity for the order in particular technology bands (wind turbine, waste, coppice, etc.). Companies interested in bidding for capacity submit claims to the Non Fossil

Purchasing Agency who then arrange contracts for Offer, the regulatory body, to approve on the basis of the original order. A number of companies have already shown an interest in taking part in the round.

If the government is to reach the target of 1,500 MW, there is still much work to be done.

According to Chris Litherland of Offer, the first two orders saw a total of 573 MW of capacity contracted. Even given the long lead times for some of the larger projects he concedes that attaining the target will be difficult and much will depend on the success of the next tranche. One of the major hold-ups has been planning permission for the schemes and several have suffered serious delay or, in a few cases, complete cancellation.

Border Wind, a company involved in wind-powered generation, built a 2.7 MW farm at Blythe Harbour that originated from the second order. The company is examining 'up to 10 projects' for the next order and expects competition to be fierce – up to several hundred applications for licences. In order to avoid what it sees as waste of contracts through non-viability, Border Wind would prefer to see a more serious review process on projects that could include planning permission being already granted. It also believes that

adjustments to the levy system – including a fixed period levy rather than the 1998 cut-off – could also go some way to making the target achievable.

The Advisory Group also pointed to defects in the NFFO levy. The linkage of support for renewables to the subsidy to nuclear power (which accounts for 97 percent of the cost of the obligation) gives a false impression to consumers of the cost of investment in renewables,

according to the report. It calls for the obligation for renewables to be separated and retitled the Renewable Energy Obligation. The NFFO pays operators of renewable schemes a premium price for their energy during a project's early life.

It also considers the terminal date of 1998 as 'far too soon' for the developments the Group consider essential; it has yet to be applied in Scotland or Northern Ireland and it does not support the development of renewables for purposes other than electricity generation.

The particular technologies that the Group would like to see further research and development expenditure made include energy from waste, crops, horizontal axis wind turbines, passive solar gain through building design and tidal power.

Most of the schemes already in operation generate under 10-15 MW of electricity and most would not be profitable without the levy. However, it is technological development which is seen as critical in the long term.

The long-awaited third order under the levy could provide a further impetus to their development. Already delayed by the energy review in the aftermath of the pit closures debacle, many operators believe that it is necessary for the order to be made as soon as possible to maintain what momentum has been built up.

There is also concern that unless projects are approved, developed and commissioned soon, operators will not receive the full benefit of the levy on which the viability of many of the schemes depends. ■

Poultry power plant

A British company has developed what is believed to be the world's first power generation plant to run on poultry litter.

The scheme at Eye in Suffolk converts 130,000 tonnes of poultry litter (wood shavings, droppings and straw – the output of 70 million chickens) into 12.5 MW of electricity by burning the material at temperatures of around 850 degrees C. The litter has a calorific content of about half that of coal and produces far less quantities of polluting gases than coal-fired plant as the chemical composition of poultry litter ensures the levels of sulphur dioxide and nitrogen oxides are minimal.

For the scheme to be successful it is necessary to be situated close to intensive broiler farms and the company believes there is potential in the United Kingdom for around half a dozen more plants. A second is being constructed in Humberside.

The scheme also helps to solve another problem – what to do with the 1.5 million tonnes of poultry litter produced in the country each year. At present most is dumped or used as a low grade fertilizer. The ash from Fibropower's project is being marketed as a high grade nitrogen free fertilizer rich in potash and phosphate.

Power from waste

There is over 3.5 million tonnes of waste produced each year in London alone and the figure continues to rise as landfill sites become more scarce. Apart from greater recycling, various schemes are either in operation or planned to make greater use of the refuse.

Cory Environmental applied in the First Order to build and operate a landfill methane gas plant at its landfill site in Mucking in Essex.

Around one million tonnes of controlled waste is delivered to the plant each year, most arriving by barge from the River Thames. The waste, which generates methane gas as it decomposes, is tipped on top of four kilometres of gas collecting pipes buried up to 18 metres below the surface.

The gas is then used to run a turbine engine which drives a giant dynamo. The electricity is then fed into the national grid.

The company spent £2.5 million developing the 4.2 MW station which has a design life of 25 years.

On a far bigger scale is the company's plan to build a 102 MW refuse to energy power station at Belvedere, near Bexley in Kent. The project will burn over 1.2 million tonnes of rubbish a year using technology already developed in Switzerland and Germany. Although the go-ahead was given for the plant in the Second Order, a public inquiry last year has delayed development and the company hopes to hear the outcome by late summer. Cory is keen to point out the environmental benefits of burning the rubbish for power generation, particularly as it could reduce the need for landfill space by up to 90 percent. Similar plants operate close to city centres in Paris, Frankfurt and Stockholm.



London Branch

'The Application of Horizontal Wells in Oil & Gas Development'

By Professor J M Peden, Heriot-Watt University
at The Institute of Petroleum
6.00 pm, Tuesday 18 May 1993

Jim Peden is Director of the Horizontal Well Technology Unit and Shell UK Research Professor in the Department of Petroleum Engineering at Heriot-Watt.

His talk will address horizontal wells and their implication for current and future field developments. The existing technology and a range of field applications will be reviewed, together with the economic significance of the technique. The talk will conclude with a personal perspective of how horizontal well technology may develop.

Tea and biscuits will be served at 5.15 pm and the meeting is followed by light refreshments, kindly sponsored by Texaco Ltd.

Enquiries: Mrs E Walker, Hon Secretary,
London Branch. Tel: 0926-404257.



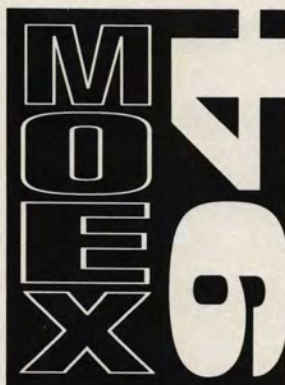
Improving Oil Industry Cost Competitiveness through the Logistics Chain

Wednesday 19 May 1993
To be held at The Institute of Petroleum

Papers being presented at this Conference will include:

- ☐ Opening Address: The role of logistics within the downstream sector
- ☐ New developments in pipeline supply
- ☐ Future petroleum movement by rail
- ☐ Is there a future for coastal tankers?
- ☐ Economic developments of contracting out storage and handling
- ☐ New developments in terminal automation
- ☐ Environmental legislation: implications of compliance
- ☐ Contracting out road distribution: has it been plain sailing?
- ☐ New technology for road tankers

For further information and a copy of the registration form, please contact
Caroline Little, The Institute of Petroleum,
61 New Cavendish Street, London W1M 8AR, UK.
Tel: 071 636 1004. Fax: 071 255 1472.



The Mediterranean

Oil & Gas Exhibition

and Conference

**25-27 JANUARY 1994
THE TRADE FAIR GROUNDS
NAXXAR • MALTA**

Bringing together top oil and gas industry executives from Southern Europe and North Africa
Providing immediate access for exhibitors to the key players in this flourishing energy market

Supported by:
The Government of Malta



Official Journal:

**OFFSHORE
ENGINEER**

Official Airline:



Sponsored by:
The Commission of the European Communities



and The Institute of Petroleum



and The Oil Industry International Exploration and Production Forum

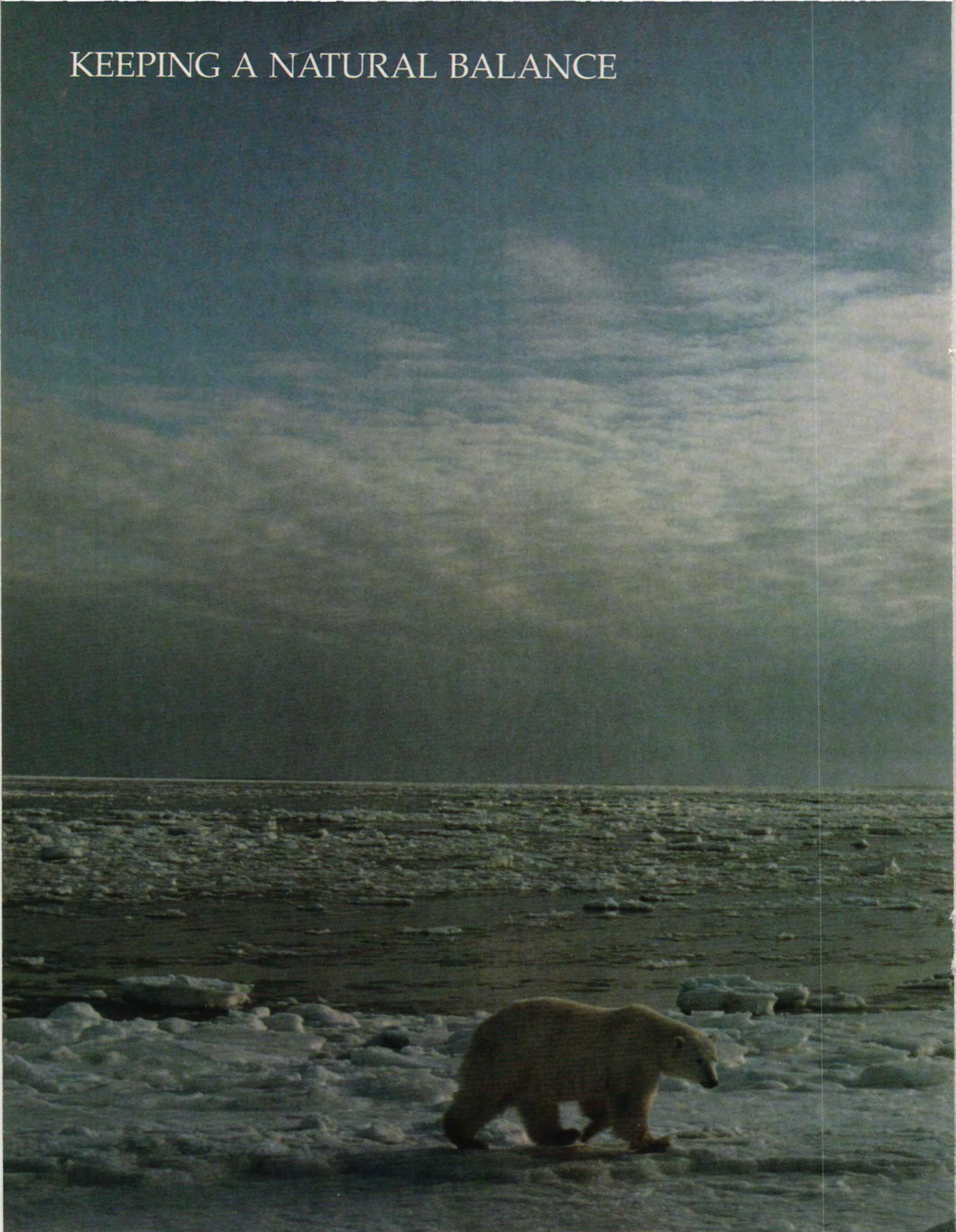


The Ministry of Economic Services has entrusted MEDSERV Limited, to run this event which is being organised on their behalf by



Spearhead Exhibitions Ltd, Rowe House,
55-59 Fife Road Kingston upon Thames,
Surrey KT1 1TA, UK. Tel: (081) 549 5831
Fax: (081) 541 5657/5016, (081) 547 2807,
(081) 546 0788 (Int. code: +44 81)
Telex: 8954102 BBSLONG

KEEPING A NATURAL BALANCE





Ethyl

We've been careful with additives for 60 years...

FORTHCOMING EVENTS

May

4th-7th

Torquay: 'International Conference on Fluid Evaluation - Migration and Interaction in Rocks'. Details: Sally Cornford, IGI Ltd., Hallsanney, Bideford, Devon EX39 5HE. Tel: (0237) 421749. Fax: (0237) 421700.

5th

London: 'Oil and Gas Deals - Understanding the Underlying Economic and Financial Principles'. Details: Langham Oil Conferences Ltd., 37 Main Street, Queniborough, Leicester LE7 3DB. Tel: (0664) 424776. Fax: (0664) 424832

5th-6th

Moreton-in-Marsh: 'The Way Ahead': a conference for industry, commerce and emergency services involved with the handling of hazardous materials. Details: Kerry Jones, Event Management, The Fire Service College, Moreton-in-Marsh, Gloucestershire GL56 0RH. Tel: (0608) 50831 ext 282. Fax: (0608) 51788

5th-7th

Birmingham: 'Performance Evaluation of Automotive Fuels and Lubricants'. Details: National Exhibition Centre, Birmingham B40 1NT. Tel: (021) 780 4321. Fax: (021) 780 4260.

10th-11th

Cambridge: 'Complying with Environmental Legislation - A Practical Course for Non-Lawyers'. Details: Elaine Hendry, Cambridge Programme for Industry, 1 Trumpington Street, Cambridge CB2 1QA. Tel: (0223) 302233. Fax: (0223) 301122.

10th-12th

Amsterdam: 'Cost/Planning/Economics for the Offshore Oil and Gas Industry'. Details: The Center for Professional Advancement, Oudezijds Voorburgwal 316A, 1012 GM Amsterdam, The Netherlands. Tel: +31-20-638 28 06. Fax: +31-20-620 21 36.

10th-13th

London: 'International Environment '93 and Analysis '93 Conferences'. Details: Labmate Ltd., 'Newgate', Sandpit Lane, St. Albans, Herts AL4 0BS. Tel: (0727) 55574. Fax: (0727) 41694.

10th-14th

Phuket, Thailand: 'Retail Automotive Lubricants - Product and Market Developments'. Details: Surasak Tharapatn, The Thavorn Palm Beach Hotel, 128/10 Moo 3, Karon Beach, Phuket, Thailand. Tel: (76) 381934-7. Fax: (76) 381555.

11th

London: 'Opportunities for Offshore Product and Service Suppliers in Far East Oil & Gas Market Place'. Details: Laura Bishop, London Chamber of Commerce & Industry, 69 Cannon Street, London. Tel: (071) 248 4444. Fax: (071) 489 0391.

11th-13th

Brighton: 'Jet Fuels through the Millennium'. The Second International Symposium on Aviation Turbine Fuel Specifications. Details: Dr Eric Goodger, 28E Jessopp Road, Norwich, Norfolk NR2 3QB. Tel & Fax: (0603) 51842

12th-13th

London: 'The Fifth European Conference on EFTPOS: 1993'. Details: Dipti Chauhan, IBC Technical Services Ltd. Tel: (071) 637 4383. Fax: (071) 631 3214.

12th-13th

London: 'Introduction to Oil and Gas Accounting'. Details: Mrs Moira McKinlay, Centre for Petroleum and Mineral Law and Policy, University of Dundee, Park Place, Dundee, Scotland DD1 4HN. Tel: (0382) 307299/307300. Fax: (0382) 22578.

12th-14th

Bath: 'Effective Membrane Processes - New Perspectives'. Details: Miss Tracey Peters, BHR Group Ltd., Cranfield, Bedford MK43 0AJ. Tel: (0234) 750422. Fax: (0234) 750074.

12th-14th

Montreux, Switzerland: Energy Roundtable IV: 'Improving Predictability in Energy Investment'. Details: Montreux Energy • BIN S.A., 11 Route de Drize, PO Box 1811, 1227 Geneva, Switzerland. Tel: (4122) 342 6346. Fax: (4122) 342 5816.

13th

Aberdeen: 'Environmental Aspects of the North West Approaches'. Details: Sarah Wilton, NERC, Polaris House, North Star Avenue, Swindon SN2 1EU. Tel: (0793) 411583. Fax: (0793) 411582.

13th-14th

Portugal: '5th ELGI (European Lubricating Grease Institute) Annual General Meeting'. Details: Ms C Koopman, Hemonylaan 26, 1074 BJ Amsterdam, The Netherlands. Tel: +31-(0)20-6716162. Fax: +31-(0)20-6732760.

14th

London: 'Petrol Station Leases, Rents and Values'. Details: Veronica Benson, Henry Stewart Conference Studies, 2/3 Cornwall Terrace, Regent's Park,

London NW1 4QP. Tel: (071) 935 2382. Fax: (071) 486 7083.

14th

London: 'United States Oil and Gas Accounting and Financial Reporting Standards'. Details: Mrs Moira McKinlay, Centre for Petroleum and Mineral Law and Policy, University of Dundee, Park Place, Dundee, Scotland DD1 4HN. Tel: (0382) 307299/307300. Fax: (0382) 22578.

17th-18th

London: 'The North Sea Towards 2000'. Details: Karen Acton, CBI Conferences, Centre Point, 103 New Oxford Street, London WC1A 1DU. Tel: (071) 379 7400. Fax: (071) 497 3646.

17th-19th

The Hague: Fifth European Congress on 'Fluid Machinery for the Oil, Petrochemical and Related Industries'. Details: Hazel Anderson or Anne Nolan, Conference Services Department C449, Institution of Mechanical Engineers, 1 Birdcage Walk, London SW1H 9JJ. Tel: (071) 222 7899. Fax: (071) 222 9881.

17th-21st

Singapore: 'The International Lubricants Business'. Details: Delilah Hamid, Omni Marco Polo Hotel, 247 Tanglin Road, Singapore 1024. Tel: (65) 4747141. Fax: (65) 4710521.

17th-18th

Edinburgh: 'Introduction to Oil and Gas Accounting'. Details: Mrs Moira McKinlay, Centre for Petroleum and Mineral Law and Policy, University of Dundee, Park Place, Dundee, Scotland DD1 4HN. Tel: (0382) 307299/307300. Fax: (0382) 22578.

FORTHCOMING EVENTS

18th-19th

Telford: 'LP Gas '93'. Details: Nelton Exhibitions Ltd. Tel: (0474) 536535.

18th-19th

London: 'Cost-Effective Refurbishment & Remediation of Bulk Liquid Storage Tanks'. Details: IIR Ltd., Industrial Division, 28th Floor, Centre Point, 103 New Oxford Street, London WC1A 1DD. Tel: (071) 412 0141. Fax: (071) 412 0145.

19th

London: Conference on 'Improving Oil Industry Cost Competitiveness through the Logistics Chain'. Details: Miss Caroline Little, The Institute of Petroleum.

19th-21st

London: 'Managing Energy Risk'. Details: BRI Training Centre, 92 Islington High Street, Camden Passage, London N1 8EG. Tel: (071) 359 0427. Fax: (071) 359 0311.

20th

Aberdeen: 'Monitoring & Control for Maximum Benefit from North Sea Oil & Gas Assets'. Details: Leanne Woods or Karen Whines, Institute of Measurement and Control, 87 Gower Street, London WC1E 6AA. Tel: (071) 387 4949. Fax: (071) 388 8431.

20th-21st

London: 'TQM Offshore '93 Conference'. Details: Offshore Conference Services, Freepost, Shillington, Hitchin SG5 3LX. Tel: (0462) 712049. Fax: (0462) 711889.

21st

London: 'Working with the Regulator'. Details: Jane Giles, Icom Group

Conferences Ltd., 109 High Street, Dodworth, Barnsley, South Yorkshire S75 3RQ. Tel: (0226) 299072. Fax: (0226) 299072.

24th-25th

London: 'Oil & Gas Transport & Security: Key to Investment in the former Soviet Union'. Details: Verna Cappuccio, Europe Energy Environment Ltd., London. Tel: (071) 493 4918. Fax: (071) 355 1415.

24th-25th

Aberdeen: 'Optimum Offshore Maintenance'. Details: Maria Coughlan, Customer Service Manager, IIR Ltd., 28th Floor, Centre Point, 103 New Oxford Street, London WC1A 1DD. Tel: (071) 412 0141. Fax: (071) 412 0145.

24th-28th

Edinburgh: Awareness Course in Fire Safety Engineering. Details: The Centre of Maritime and Industrial Safety Technology, Heriot-Watt University Research Park, Edinburgh EH14 4AP. Tel: (031) 451 5253. Fax: (031) 451 5440.

25th

(please note change of date)
London: Conference on 'Petroleum-Based Land Contamination'. Details: Miss Caroline Little, The Institute of Petroleum.

25th-26th

London: 'Tensioned Buoyant Platforms'. Details: Robert Gibbins, 2 Tavistock Place, London WC1H 9RA. Tel: (071) 837 6362. Fax: (071) 837 0822.

25th-26th

Coventry: 'Update '93'.

Details: Petroleum Training Federation, Suite 1, Morley House, 314-322 Regent Street, London W1R 5AB. Tel: (071) 255 2335. Fax: (071) 255 1828.

25th-26th

Tunis: 'Mediterranean Gas Markets Conference 1993'. Details: Overview Conferences, 82 Rivington Street, London EC2A 3AY. Tel: (071) 613 0087. Fax: (071) 613 0094.

25th-26th

Singapore: 'Asian Electricity - The Growing Commercialisation of Power Generation'. Details: Sally Hatcher, Financial Times Conference Organisation, 102-108 Clerkenwell Road, London EC1M 5SA. Tel: (071) 814 9770. Fax: (071) 873 3969/3975.

25th-27th

Birmingham: 'Control & Instrumentation Exhibition'. Details: MGB Exhibitions Ltd, Marlowe House, 109 Station Road, Sidcup, Kent DA15 7ET. Tel: (081) 302 8585. Fax: (081) 302 7205.

26th-27th

London: 'Transportation and Insurance of Bulk Oil Cargo: Current Practical and Legal Problems'. Details: Mrs Moira McKinlay, Centre for Petroleum and Mineral Law and Policy, University of Dundee, Park Place, Dundee, Scotland DD1 4HN. Tel: (0382) 307299/307300. Fax: (0382) 22578.

26th-27th

Aberdeen: 'Optimum North Sea Drilling Strategies'. Details: Maria Coughlan, Customer Service Manager, IIR Ltd., 28th Floor, Centre Point, 103 Oxford Street, London W1CA 1DD. Tel: (071) 412 0141. Fax: (071) 412 0145.

26th-27th

London: '1st International Conference on Tanker Demurrage'. Details: Jo Eason or Tim Walters, Asdem Ltd., Colette House, 52-55 Piccadilly, London W1V 9AA. Tel: (071) 493 0973. Fax: (071) 499 5270.

26th-28th

Amsterdam: 'Introduction to Petroleum Refinery Processing' - includes Status of Environmental Regulations and Effect on Future Products and Operations. Details: The Center for Professional Advancement, Oudezijds Voorburgwal 316A, 1012 GM Amsterdam, The Netherlands. Tel: +31-20-638 28 06. Fax: +31-20-620 21 36.

27th

London: 'The Shipment of Oils & Fat - The Quality Imperative'. Details: Linda McKay, IBC Legal Studies and Services Ltd., Gilmoora House, 57-61 Mortimer Street, London W1N 7TD. Tel: (071) 637 4383. Fax: (071) 631 3214.

June

3rd-4th

London: '1993 - The Year of Vietnam - Business Opportunities in the Oil and Gas Industry'. Details: Nadia Ellis, IBC Technical Services Ltd. Tel: (071) 637 4383. Fax: (071) 631 3214.

6th-11th

Singapore: 'Third International Offshore and Polar Engineering Conference 1993'. Details: ISOPE, P.O. Box 1107, Golden, Colorado 80402-1107 USA. Tel: 1-303-273-3673. Fax: 1-303-420-3760.

FORTHCOMING EVENTS

7th

London: 'Negotiating Joint Operating Agreements'. Details: Jane Giles, ICOM Group Conferences Limited, 109 High Street, Dodworth, Barnsley, South Yorkshire S75 3RQ. Tel: (0226) 299072. Fax: (0226) 299072.

7th

London: 'Coal Bed Methane' – a one day Symposium. Details: Heidie Gould, The Geological Society, Burlington House, Piccadilly, London W1V 0JU. Tel: (071) 287 1433.

8th

London: Conference on 'Current Developments in North Sea Drilling Operations'. Details: Miss Caroline Little, The Institute of Petroleum.

8th-9th

Aberdeen: 'Response to Incidents Offshore – Conference'. Details: Sarah Peace, IBC Technical Services Ltd. Tel: (071) 637 4383. Fax: (071) 631 3214.

8th-10th

Birmingham: 'Forecourt Marketing Show & Convenience Retailing 1993'. Details: Nick Needs, Blenheim PEL, Blenheim House, 630 Chiswick High Road, London W4 5BG. Tel: (081) 742 2828. Fax: (081) 747 3856.

13th-18th

Wiltshire: 'The Practical Essentials of Natural Gas'. Details: Anita Gardiner, The Alphantania Partnership, Alphantania House, 82 Rivington Street, London EC2A 3AY. Tel: (071) 613 0087. Fax: (071) 613 0094.

14th-25th

Amsterdam: 'The International Gas Business: Technology, Economics, Project Development and Markets' – a two week management development program. Details: Sue Maloney, 535 Boylston Street, Boston, MA, 02116 USA. Tel: (617) 536 0202. Fax: (617) 536 4396.

16th-18th

Cannes, France: '6th International Conference on Multiphase Production'. Details: Mrs Kit Stones, Conference Organiser, BHR Group Limited, Cranfield, Bedford MK43 0AJ. Tel: (0234) 750422. Fax: (0234) 750074.

16th-18th

London: 'Land Pipeline Engineering – A Three Day Course'. Details: Sarah Peace, IBC Technical Services Ltd. Tel: (071) 637 4383. Fax: (071) 631 3214.

17th-18th

Paris: 'Oil Markets: Strategies for Coping with New Challenges'. Details: Corinne Redonnet, Conference Organiser, DRI Europe, Wimbledon Bridge House, 1 Hartfield Road, Wimbledon, London SW19 3RU. Tel: (081) 543 1234. Fax: (081) 545 6248.

21st-22nd

Barcelona: '1993 European Oil Refining Conference & Exhibition'. Details: Mireia Mangual, WEFA Energy, 60/62 Margaret Street, London W1N 7FJ. Tel: (071) 631 0757. Fax: (071) 631 0754.

22nd-24th

London: 'Energy Conference & Exhibition'. Details: Allan Coates, Philbeach Events Ltd.,

Earls Court Exhibition Centre, Warwick Road, London SW5 9TA. Tel: (071) 370 8238. Fax: (071) 370 8143.

23rd-24th

Aberdeen: 'Preventing Oil Discharge from Drilling Operations – The Options'. Details: Nadia Ellis, Conference Organiser, IBC (Holdings) PLC, Gilmoora House, 57-61 Mortimer Street, London W1N 7TD. Tel: (071) 637 4383. Fax: (071) 631 3214.

23rd-24th

London: 'Pipeline Management 93'. Details: The Conferences Manager, IWEM, 15 John Street, London WC1N 2EB. Tel: (071) 831 3110. Fax: (071) 405 4967.

23rd-25th

London: 'Introduction to Oil Industry Operations'. Details: Miss Caroline Little, The Institute of Petroleum.

28th-29th

Aberdeen: 'Minimise Operating Costs & Extend Field Life Through Not Normally Manned Facilities'. Details: Maria Coghlan, Customer Services Manager, IIR Industrial Ltd, 28th Floor, Centre Point, 103 Oxford Street, London WC1A 1DD. Tel: (071) 412 0141. Fax: (071) 412 0145.

28th-30th

London: 'Introduction to Petroleum Economics'. Details: Miss Caroline Little, The Institute of Petroleum.

29th-30th

London: 'VOC Emissions in the Petroleum Industry :

Estimation, Measurement and Reduction'. Details: Business Seminars International Ltd., 56-60 St John Street, London EC1M 4DT. Tel: (071) 490 3774. Fax: (071) 490 2296.

July

5th-6th

Leeds: 'Engine Emissions Measurement'. Details: Miss Julie Charlton, University of Leeds, Dept Fuel and Energy, Leeds LS2 9JT. Tel: (0532) 332494. Fax: (0532) 440572.

5th-6th

London: 'Partnering & Closer Working Relationships'. Details: Maria Coghlan, IIR Ltd., Industrial Division, 28th Floor, Centre Point, 103 New Oxford Street, London WC1A 1DD. Tel: (071) 412 0141. Fax: (071) 412 0145.

7th-8th

London: 'Third International Conference on Maritime Communications and Control. Details: Ms Rhian Bufton, Conference Organiser, The Institute of Marine Engineers, 76 Mark Lane, London EC3R 7JN. Tel: (071) 481 8493. Fax: (071) 488 1854.

12th-16th

London: 'Advanced Management Seminar Program'. Details: Mrs Julie Chapman, World Petroleum Congresses, 61 New Cavendish Street, London W1M 8AR. Tel: (071) 636 1004. Fax: (071) 255 1472.

Which way forward for a revitalised Kuwait?

By John Roberts

It has taken Kuwait barely two years from its liberation on 27 February 1991 to restore output to pre-war production levels. During the runup to the February 1993 OPEC meeting in Vienna, Kuwait said that it was producing at no less than 1,988,000 b/d (barrels a day). Such a recovery would have been deemed unthinkable when the Allies moved in through the blazing oilfields and past the wreckage of damaged refineries and destroyed oil terminals during the liberation two years earlier.

But the very pace of recovery means there are serious policy questions to be addressed. There are already problems with OPEC concerning what constitutes a fair quota for a resurgent Kuwait. The intensity of extraction has raised questions concerning possible post-liberation damage to the underlying oil reservoir. Nader Sultan,

of Kuwait Petroleum International, told the Oxford Institute for Energy Studies last September that Kuwait needed to address the question of the desired level of future production. Should Kuwait be planning merely to restore pre-invasion production capacity, or working to expand capacity, he asked.

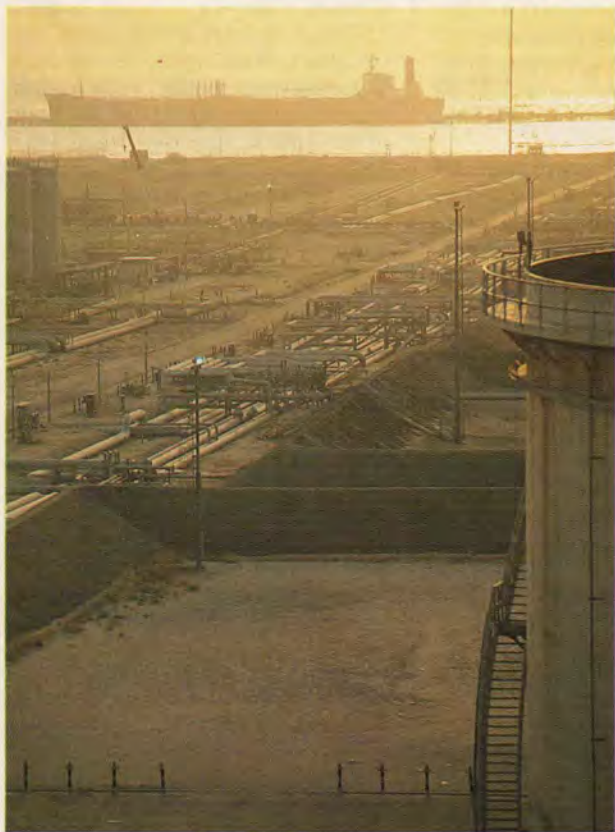
would be 1.75 million b/d; it would then rise to 1.85 million b/d in the second quarter, to 2.05 million b/d in the third and to 2.15 million b/d in the fourth quarter.

It may well be that in practice Kuwaiti output will rise even faster. Certainly, KPC seems determined to ensure it regains a sustainable production capacity of at least 2.5 million b/d as soon as possible. Although Kuwait has accepted an OPEC quota of 1.6 million b/d for the second quarter of 1993, it has made a capacity increase a key element in its hopes for a substantial quota increase for the rest of the year. Thus, from 1 July OPEC has agreed that Kuwait will be allowed to produce 'in parity with the production allocation to other countries with similar production capacity, historical market share, and quota.'

Kuwaiti officials have made it clear that the country with which they believe Kuwait should have parity is the UAE, where capacity is currently around 2.6 million b/d but with an expansion programme aimed at taking it to 3.0 million b/d over the next few years and where actual output averaged about 2.28 million b/d last year. In practice, it seems likely that Kuwait will take the OPEC formula as meaning that it will have a right to produce at around 2.0 million b/d from fields under its sole control, while output from the former Neutral Zone, which is shared with Saudi Arabia, can be expected to yield as much as 250,000 b/d to Kuwait alone. In essence, the outlook is that actual Kuwaiti production is likely to reach close to 2.2 million b/d by the end of

The official response appears to be that capacity will be expanded. The government's immediate target is a capacity of 2.5 million b/d but there are indications that the Kuwait Petroleum Co. (KPC), the Kuwaiti oil industry's parent company, may be thinking of a longer-term target approaching 4.0 million b/d.

Shortly after taking office last October, Kuwait's new Oil Minister, Mr Ali Ahmad al-Baghli, declared that Kuwait intended to secure a steady increase in actual output throughout 1993. Projected output for the first quarter



Al-Ahmadi refinery. Photo courtesy of Kuwait Petroleum International

the year – and with considerable efforts still being exerted to ensure capacity is raised much higher.

In effect, the exertions required for pure reconstruction of the oil industry are over. Henceforth, Kuwait will be, or should be, in a period of consolidation. For the first time in more than two-and-a-half years it can afford to take stock, to allow an increase in sustainable production capacity to take precedence over an immediate increase in output. During the course of the year, Kuwait will receive a number of studies by British Petroleum and specialist UK and North American companies concerning the state of the country's oilfields and the best methods of restoring their long-term productivity. Under an agreement signed last July, BP contracted to provide technical services for a 42 month period ending in March 1996 and covering production development, reservoir management, damage assessment and drilling. BP agreed to second 30 experts to Kuwait and to provide Kuwait with access to the company's upstream technology. The Kuwaitis were also given the opportunity to participate in BP's own exploration research and development.

Reserve base

One of the key issues which BP is considering is the vexed question of the scope and condition of the country's reserve base. Kuwait's recoverable reserves on the eve of the invasion were estimated at 94.5 billion barrels. However, reports by the local Al-Shall consultancy suggested that some Western oil companies bidding in the first half of last year for reservoir management contracts believed the true figure to be much lower, possibly as low as 58 billion barrels. The government dismissed such claims as unproven and unscientific. Yet the presence of increasing volumes of water in the reserve base and the possibility that, in its zeal to restore output, some further damage may have been inflicted on the reservoir base, means that it is probably impossible at present to give an accurate figure for the country's recoverable reserves.

Kuwait's recovery programme was divided into two phases. Between Liberation Day, 27 February 1991, and July 1992 the phase known as al-Awda (the Return) was handled by Bechtel, which was appointed project manager contractor. Repairs to the oil sector during this phase were estimated at \$2.5 billion. Bechtel's

own contract is currently expiring and it is not yet known whether it will be Bechtel or another US company which will secure the principal project management contract for the second phase of the recovery programme, known as al-Tameer (the Rebirth).

Work under the contract includes front-end engineering and design work for all the Kuwait Oil Company's oil sector projects. Although an award was expected in March, it has not been made at the time of writing. Other work, to be handled under the al-Tameer programme includes extending the pipeline network between gathering and distribution centres, construction of gas treatment units and considerable work on installing and replacing electrical and mechanical systems. There will be increased use of remote monitoring systems.

Al-Tameer's overall cost is put at KD1,915 million, which is about \$6.6 billion. Of this, some KD750 million (\$2,590 million) will go to general reconstruction; a further KD750 million (\$2,590 million) to the expansion of the Petroleum Industries Corporation; KD 175m (\$600 million) to construction of additional oil facilities, KD 90 million (\$310 million) to repairing refineries; a further KD 90 million (\$310 million) to repairs to the damaged facilities and fields operated by the US Getty Oil Company in the former Neutral Zone; and KD 60 million (\$210 million) for drilling new wells.

By the end of 1992, more than 350 of the country's pre-war oilwells were back in commission following workovers, while a further 70 new wells had been drilled. Before the invasion, Kuwait has around 900 wells, of which 727 were set alight by the retreating Iraqis. Around 200-220 of these wells are considered beyond repair.

Equally serious was the damage sustained by the gathering centres. Twenty-six of these were operational before the invasion but eight were considered so damaged that they will have to be completely replaced. This month, March, should see that last of the 18 repairable centres brought back on line.

Between 1995 and 1998, a cluster of new gathering centres will be built, which should take total gathering capacity to 4.25 million b/d. Two of these, each with a 200,000 b/d capacity, will serve the Minagish and Umm Qadir fields, while five others will also be built. Low bidder for the first two

centres was a group headed by Foster Wheeler, which included Italy's Belleli and the local Mohamed Abdulmohsin Kharafi, with a bid of KD 184 million (\$596 million). The contract is expected to be awarded in May.

The KOC's emphasis on expanding its gathering capacity is the best confirmation to date that it is, indeed, as some reports have suggested, contemplating raising actual production capacity to a level of 4.0 million b/d by 1997.

Iraqi wells

The most controversial aspect of Kuwait's oil recovery programme is, of course, its acquisition of 11 oil wells drilled and operated by Iraq. At least eight of these wells were drilled by Iraq in territory that, for many years, was generally acknowledged to be Kuwaiti, since they were located south of the operational line held by Arab League forces when they came in to establish a security cordon for Kuwait in the wake of the 1961 crisis.

Iraq subsequently secured physical control of this territory as a result of southward probes conducted in the mid-1970s when its border city of Umm Qasr began expanding into territory formerly policed by the Kuwaiti authorities.

As a result of the UN Security Council's decision to lay down a definitive border between the two countries, these territories are now under Kuwaiti control. So is a small strip of territory slightly to the north of the Arab League line containing a further three oil wells, one of which is only a few metres inside the international boundary decreed by an international survey team established by the United Nations.

The 11 new wells draw on oil from the southernmost tip of Iraq's major South Rumailah oilfield. The line of eight Iraqi wells lies barely 400 metres north of a parallel line of oilwells drilled and developed by Kuwait serving the Rutqa field. In the past, there have been some assertions that Rutqa was indeed a separate field and not merely an extension across the border of South Rumailah. In effect, however, it is clear that all the wells in this area draw on the same reservoir.

Whereas in the past Kuwait pumped some 10,000 b/d from Rutqa, it can now be expected to increase output considerably even though it may be some time before the three northernmost wells it has acquired become productive because of minefields in the area. Baghdad, however, can be expected to scru-

tinize closely Kuwaiti output since it does not recognise the legality of the new border and is likely to argue that Kuwait is, in effect, pumping up Iraqi crude. The gathering centre that serves the Raudhatain oilfield adjacent to Rutqa was, together with one of the Burgan gathering centres, the last of 18 to be brought back into commission. Now that it is operational, pumping from the northern Kuwaiti fields will be considerably eased.

Refinery reconstruction

As well as getting its production back from the wreckage of the war, KPC has also had to preside over a programme of repairing and renovating its refineries. At present, the Mina Abdullah refinery is back on stream with a near-full 230,000 b/d capacity. Its two remaining conversion units should be back in action in April, restoring it to full pre-war capability. Capacity at Mina al-Ahmadi is already up to 185,000 b/d and by November a third crude unit of 100,000 b/d should be restored. However, a fourth crude unit seems beyond repair.

The most damaged refinery, Shuaiba, has been out of action since the invasion, but repairs are now progressing fast and, although some units still require complete replacement, a capacity of 130,000 b/d should be available from September onwards. The balance of the refinery's prewar capacity of 195,000 b/d may well have to be written off, although no decision is expected on this until the end of the year.

Future capacity

It is a measure of the success of Kuwait's recovery programmes that its output quota should once again be a source of serious controversy amongst the member states of the OPEC. Kuwait is now capable of producing at levels well above its pre-invasion quota of 1.5 million b/d. What it now wants is the right to produce at significantly higher levels in order to compensate both for the physical destruction of its industrial infrastructure and also for the loss of revenues between 2 August 1990 and the start of 1993 by which time its output was running, on a sustained basis, at well above 1.5 million b/d.

However, the country's oil policies and ambitions are once again arousing concern, not merely amongst traditional critics or enemies such as Iraq, but even in Saudi

Arabia. Saudi Oil Minister Hisham Nazer, in an address in February in Houston, was gently chiding his neighbour when he commented on the impact that statements by Kuwaiti officials had had upon the market. After recalling al-Rqobah's comment that Kuwait, because of its recent sufferings, would not accept a production quota until oil output reached 2.0 million b/d, Mr Nazer continued: 'Soon after, his successor raised the stakes by confirming that no quota will be considered until production capacity attains the high level of 2.5 millionb/d. The market could not but respond bearishly to this policy statement.'

What Mr al-Baghli said in his comments last December was that there was 'no room for discussion of a Kuwaiti quota until Kuwait reaches its pre-invasion production capacity which was 2.5 million b/d.' Since Kuwait in fact subsequently accepted an OPEC quota of just 1.6 million b/d from 1 March, at a time when its capacity was no more than 2.0 - 2.1 million b/d, his comment should be taken as an indication of Kuwait's determination to pursue a policy of first increasing capacity and then using this increased capacity to justify an actual increase in output.

A new Kuwait

By now, it has become a truism that the post-war Kuwait is a very different country to pre-war Kuwait. The country's population is much smaller than it was, perhaps 1.4 million today compared to 2.2 million before the Iraqi invasion. It knows that it will have to take persistent Iraqi claims to Kuwaiti territory, or even to the whole of Kuwait, seriously and that this will require it to seek external protection for the foreseeable future. Even in the absence of Iraqi crude from the market, there are, therefore, clear external constraints on the possible reappearance of the country's militant pre-invasion oil policy, where an increased market share for Kuwait was considered a more attainable target than increased oil prices that would benefit all Kuwait's fellow OPEC producers.

But there are also new internal constraints. The country's oil policy and the operations of the Kuwait Petroleum Company are now a legitimate matter for serious discussion by Kuwait's elected representatives. The new oil minister, although essentially a technocrat, is also one of six members of Parliament who were

given cabinet seats following last October's General Election, the first for more than seven years. A majority of the 60 National Assembly members, 50 of whom are elected and 10 appointed, are individuals who, before the poll, were generally considered to be critics of the government to a greater or lesser extent.

Overall, the National Assembly appears determined to use to the full its right to study and analyse Kuwaiti policy, although it is not challenging the government's right to conduct a particular policy. It has secured considerable concessions, including the right to scrutinise all Kuwait's investments. This followed mounting concern that maladministration by senior officials of the Kuwait Investment Office may have cost the KIO the loss of several billion dollars of investments in Spain. In addition, the National Assembly has taken up the possible fraud involved in the purchase of four 280,000 dwt tankers from South Korea, delivered to the Kuwait Oil Tanker Company during the course of 1992. Investigations into illegal financial transactions were initiated by Mr al-Rqobah early last year and the case was referred to the Attorney General in January with warrants being issued for the questioning of former KOTC Chairman Fattah al-Badr who was out of the country in connection with fraudulent activities believed to total KD13million (\$44million) and malpractices concerning the chartering of tankers during the Gulf 'tanker war' of 1987.

This greatly changed environment makes it likely that while Kuwait will indeed move steadily to expand its production capacity, following an example set by Saudi Arabia, the UAE, Iran and Nigeria, it will take a much more cautious line than in the past when it comes to increasing actual output. In 1990, alleged Kuwaiti over-production helped to trigger the Iraqi invasion. Now that it is once again in a position to produce at above its OPEC quota, Kuwait will not only have to judge the reaction to such a move of potential antagonists, notably Iraq, but also of potential allies, notably Saudi Arabia. Of all the major Arab oil producers, Kuwait is the only state which knows for sure that it can no longer risk taking unilateral action when considering the such politically tendentious questions as whether to counter cheating by other OPEC members by producing itself at more than its OPEC quota and, if so, by how much. ■

High conversion rates for ether-based oxygenate process

By Gary R Patton, P.E., Licensing Specialist, Phillips Petroleum Company

A high-conversion chemical process to produce fuel ethers for blending into reformulated gasolines is being made available on licence by Phillips Petroleum Co of Bartlesville, Oklahoma.

'The low-investment, low-utility process gives refiners an economical way to produce whatever ether product best utilizes their C₄ and C₅ feedstocks to meet market demands and comply with environmental regulations,' said Gary Patton, Phillips Licensing Division.

The process can produce methyl tertiary butyl ether (MTBE), ethyl tertiary butyl ether (ETBE), tertiary amyl methyl ether (TAME) or tertiary amyl ethyl ether (TAE) with typical refinery process equipment and techniques and can achieve conversion levels between 92 and 99 percent, depending on the ether.

The ether produced is determined by which hydrocarbon fraction is used for the feedstock and which alcohol is selected for the reaction.

In refineries now producing MTBE, for example, the process makes possible an easy switch to TAME with its lower Reid Vapour Pressure (RVP), thus helping refiners meet tightening government RVP limits.

'If the U.S. continues tax subsidies for ethanol in gasoline blends, refineries equipped with the Phillips process could easily produce ETBE or TAE which use ethanol and qualify for the subsidy,' Mr Patton said.

'This TAME process improves reactive isoamylene conversion rates by as much as 22 percent over conventional fixed-bed units, reduces the need for alcohol recovery operations by promoting more complete reaction of olefins and alcohol and reduces catalyst-damaging by-products by more efficient conversion and cooler reaction temperatures than with competitive processes,' he added.

In addition, the process uses standard refinery unit operations rather than the complex catalytic distillation used by competitive processes.

This process can convert more than 92 percent of reactive isoamylenes into TAME and more than 99 percent of isobutene to MTBE, for example, while conventional processes convert only 70 percent of reactive isoamylenes to TAME and only about 96 percent

of isobutene to MTBE.

The process also can be combined with the Phillips Petroleum STAR (Steam Active Reforming) Process for light paraffin dehydrogenation to produce the MTBE from isobutane.

No need for exotic equipment

This etherification process was designed to offer the most efficient units possible with proven technology. It uses conventional distillation and liquid-phase, down-flow, fixed-bed reactors, thus avoiding the specialized equipment required by catalytic distillation and other complex technologies.

By controlling alcohol/olefin ratios and operating conditions, the etherification process minimizes the formation of by-products such as tertiary amyl alcohol, tertiary butyl alcohol, dimethyl ether and diethyl ether, thus reducing or eliminating the need for oxygenate removal systems and increasing catalyst life in comparison with other etherification processes.

The process prevents production of these harmful, catalyst-deactivating by-products by operating at a 1:1 molar ratio of reactive olefin to alcohol for complete reaction and

by operating in the liquid phase at temperatures below the boiling point.

While other processes can leave as much as one-half of one percent of MTBE in the raffinate, this process more completely separates the ether products. This can result in a nearly oxygenate-free raffinate stream which is suitable as alkylation unit feedstock without further processing.

Zero down-time for catalyst change

This unit design also provides for easy catalyst changeout without shut-down. Refiners can continue to produce ether while changing out a portion of the ion exchange catalyst during a one to three day procedure without having to shut down the etherification operation completely.

In contrast, catalyst changes in catalytic distillation process units require complete unit shut-downs and longer turnaround periods because the catalysts are contained in bales. ■



Phillips Petroleum Philtex plant

Expansion in US regulation of gasoline emissions

By Judith Gurney

The 1990 Clean Air Act mandated changes in the composition of gasolines sold in the United States to meet the requirements of two separate pollution reduction programmes. To reduce high levels of carbon monoxide emissions during winter months, it requires gasolines sold between 1 November and 1 March in 39 cities classified as carbon monoxide non-attainment areas to contain at least 2.7 percent by weight of oxygen in the form of blended oxygenates. To reduce smog and ozone levels, it requires gasolines sold in nine extended metropolitan areas, and in any other areas which opted into this programme, to be reformulated as to their content of benzene, aromatics, oxygen, heavy materials and detergents. The oxygenated fuels programme began 1 November 1992; the reformulated gasoline programme will start 1 January 1995.

Oxygenate programme

The Environmental Protection Agency (EPA) estimates that 70 to 90 percent of carbon monoxide pollution comes from motor vehicles, especially during winter. It takes several minutes for a vehicle starting in cold weather to warm up and exhaust carbon monoxide emissions are highest during this period. Pollution is intensified by temperature inversions, which often occur in winter, when a layer of warm air traps emissions at lung level.

Oxygenated fuels designed to lower the level of carbon monoxide emissions are regular gasolines blended with liquid oxygen compounds. Refiners currently rely mainly on two oxygenates – methyl tertiary butyl ether (MTBE), a petrochemical derived from methanol which can be added at the refinery level, and ethanol, made from fermenting grains, primarily corn (maize), which must be added at the terminal when product is pumped into tank trucks. To meet the 2.7 percent by weight oxygen content rule, oxygenated gasolines must contain at least 15 percent by volume MTBE or 7.4 percent by volume ethanol. The wholesale market for oxygenated fuels, from November 1992 to March 1993, included about 38 percent of the national gasoline market, ranging in value from \$14

million to \$16 million a day. It is estimated that MTBE had roughly 70 percent share of this market and ethanol 30 percent. Both of these oxygenates will also be used in reformulated gasolines.

MTBE is produced by reacting isobutylene with methanol. Many refiners have captive, on-site MTBE plants within their refineries which use a by-product supply of isobutylene from fluid catalytic cracking units. In addition, ARCO Chemical, Texaco Chemical and Texas Petrochemical, among others, have stand-alone MTBE plants in the Gulf Coast area. The Texas Eastern Products Pipeline Company (TEPPCO) is building a 10-mile shuttle pipeline along the Houston Ship Canal, where some 70 percent of available stand-alone capacity for MTBE is located, to move MTBE between producers and refiners. TEPPCO, which has storage facilities at its Beaumont, Texas marine and pipeline terminals, is also planning system modifications to allow pipeline movement of MTBE from the Gulf Coast to the upper Midwest for use in the Chicago, Cleveland, and Detroit markets. Pipelines must be retrofitted to carry neat MTBE and oxygenated fuels. The 'soft' materials in their valves and pump stations must be composed of materials which can tolerate MTBE's chemical makeup. Ethanol also causes

problems in pipelines.

The current supply of isobutylene from refineries and stand-alone plants is considered inadequate to meet future demand for MTBE in oxygenated and reformulated gasolines. Environmental regulations limiting vapour emissions keep butane out of gasoline and free it up to make additional isobutylene, but at a price. MTBE can also be made by upgrading natural gas liquids. Other oxygenates which have a small market share are ethyl tertiary butyl ether (ETBE), which competes for the same refinery isobutylene as MTBE; diisopropyl ether (DIPE), which is a by-product of isopropyl alcohol; and tertiary amyl methyl ether (TAME), produced by reacting isomylene and methanol.

Ethanol, however, is currently the main oxygenate competitor to MTBE, despite the fact that it has a tendency to make gasoline evaporate faster and therefore emit more smog-causing chemicals. Originally, the EPA was strongly opposed to ethanol use in the oxygenate gasoline programme and, in its directive of 16 August 1991, forbade chemical ethanol use in reformulated gasolines. Incensed by this ruling, grain farmers in the Midwest made ethanol an political issue. They demanded that President Bush guarantee the use of ethanol in both of the EPA pollution reduction programmes. In the heat of the election, the former president

recommended a regulatory exception for ethanol. He called for a waiver of Clean Air Act gasoline volatility requirements for fuels containing ethanol and recommended that ethanol fuels be sold in 30 percent of the reformulated gasoline market. Any increase in smog-forming emissions that resulted from the inclusion of ethanol in this market segment would be offset by reductions in the volatility of MTBE-blended gasolines. In this way, the gasoline pool would achieve overall reductions that met regulatory requirements. This proposal is still under consideration by the EPA.

In the oxygenate programme which recently ended, most refiners used either MTBE or ethanol in their gasolines, the choice being dependent on cost and market location. In Oregon and Washington, for instance, they favoured ethanol because both states gave a tax rebate for its use. In southern California, where there are strict vapour pressure requirements, and where evaporation is a problem due to the warmer climate, refiners favoured the use of MTBE.

Preliminary reports regarding the sales of oxygenated gasolines this past winter indicate that carbon monoxide levels were reduced, notably in critical areas like San Francisco. This reduction, however, has also been attributed to other causes, notably unusually high rainfall. Some consumers strongly opposed the use of oxygenated fuels which have a strong smell, especially if they contain MTBE. Oxygenated fuels, being less combustible, reduce mileage per gallon and cost more at the pump. There have been several reports of health reactions in Alaska, Colorado, Montana and New Jersey. These are currently being investigated by the EPA and the American Petroleum Institute. Complaints of headaches and nausea, with protesters parading in cars draped in black crepe paper, led to a ban of MTBE-oxygenated gasoline in Fairbanks, Alaska, in December. Refiners have been quick to point out that both MTBE and ethanol have been added to gasolines for a number of years, principally to raise octane levels, without causing health complaints. Previous use, however, has been at much lower concentration levels.

Reformulated gasolines

Reformulated gasolines, whose use will be required year round, involve a more extensive change in fuel components than oxygenated gaso-

lines in order to reduce emissions of volatile organic compounds and toxic substances. The sale of reformulated gasolines will be required after January 1995 in nine metropolitan areas with unacceptable ozone levels, namely Baltimore, Chicago, Hartford, Houston, Los Angeles, Milwaukee, New York City, Philadelphia, San Diego and their surrounds. These cities represent about 25 percent of the national gasoline market.

Other areas exceeding the federal ozone air quality standard can voluntarily opt into the programme and it appears that a number will do so. Conventional gasolines sold outside these cities are prohibited from containing more toxic organic compounds than previously; this regulation is intended to prevent the dumping of substances removed from reformulated gasoline into this gas pool.

The Clean Air Act defines reformulated gasoline in terms of general requirements and performance standards. General requirements cover oxygen, benzene and heavy metals content. Performance standards cover emissions of volatile organic compounds (VOCs), nitrogen oxides and toxic substances, including benzene, 1,3-butadiene, formaldehyde, acetaldehyde and polycyclic organic matter. Emissions are described in terms of a baseline vehicle using a defined baseline fuel. The baseline vehicle is an EPA mathematical model based on representative 1990 vehicles; baseline gasoline is the average of all US gasolines marketed in 1990. The minimum overall performance standard is a 15 percent emission reduction from baseline of VOCs during the summer high-ozone season and a 15 percent emission reduction in toxic substances during the entire year.

To come up with a formula for reformulated gasoline, the EPA called a regulatory negotiation (regneg) of representatives of the oil and automobile industries and other interested parties. This regneg group agreed on a two-phase approach. During the first phase, beginning in January 1995, gasoline adhering to a 'simple model' would be certified by the EPA as meeting emission reduction standards. Requirements for this simple model include at least 2.0 percent oxygen by weight, no increase in nitrogen oxide emissions, no more than 1.0 percent benzene by volume, no heavy metals such as lead or manganese except by special permission, and volatility reduction to 7.2 pounds per square inch (psi) Reid

Vapour Pressure (RVP), or 8.1 psi RVP, depending on the geographic area in which it is sold. Sulphur, T90 and olefins must not exceed average values in the refiner's 1990 gasoline. The EPA believes that following this prescription will result in a 15 percent reduction in VOC emissions. Gasoline sold to consumers at service stations will be periodically checked to ensure that the above standards are met.

Complex model

The second phase of the EPA programme will come into effect in March 1997. Reformulated gasolines will then have to meet the specifications of a 'complex model' covering not only volatility and VOC emission reductions but also sulphur, olefins, oxygen, aromatics, benzene and T90 content. The complex model will be constructed in such a manner that every refiner will have its own set of deviations from baseline gasoline. The problems facing each refinery will be different, as will be the precise nature of its reformulated gasoline, depending on the crudes it uses, its products and the locations of its markets.

There has been a prolonged debate concerning the complex model and the outcome is still uncertain. The EPA was supposed to issue a proposed rule for this model by 30 November 1992 and failed to do so. On 19 January it issued a rule-making notice for discussion which included former President Bush's special regulatory proposals for the use of ethanol. Presumably the complex model will not be finalized until the ethanol issue is settled; the debate will not be open-ended, however, as there is a court-agreed deadline for the final complex model of 15 September.

Oil companies are concerned about the EPA's delay in issuing requirements for the complex model as they are unable to finalise their decisions regarding configuration of process units, operations and business strategies. Most will probably opt for meeting the requirements of the simple model from 1995 to 1997, although they have the option to adhere to the complex model during this period if they wish. A major worry of many is to avoid a 'bump' when they convert from the simple to the complex model. (Any refiner whose gasolines test higher than baseline in regulated toxic substances parameters – probably about half of all refiners – will face a 'bump' in conversion.) The cost of meeting the requirements of both models has been

estimated at \$10 to \$30 billion. The financial burden may force some smaller refineries to close and place others in economic jeopardy. The simple model probably won't pose significant technical problems but the complex model will.

Reformulated bellwethers

While most major oil companies are waiting for the EPA to finalise the complex model, some, notably ARCO and Chevron, have come out with preliminary reformulated gasolines. ARCO and Chevron are major players in California, where state regulations regarding gasoline composition are more complicated and severe. (Deposit control additives, for instance, are already required in every gallon of gasoline sold in the state.) ARCO, with the largest share of the California market, developed a reformulated fuel in late 1991, in an attempt to pre-empt advanced California environmental standards and seize technological high ground. It made this move because it has both the financial strength and sales volume to justify more drastic changes than most of its competitors. Chevron, which ranks second in the California market, has received the state's first certification for reformulated diesel fuel and is participating in a two-year test of this fuel in a fleet of Federal Express

delivery vans. UNOCAL, on the other hand, which ranks fourth in the California market, has decided against additional capital spending and has withdrawn from the California diesel market.

Opposition to reformulated gasolines has tended to focus on California's stringent requirements, listed in the **Table**. There is also a concerted movement to stop the adoption of California standards by other states. Opponents of federal as well as state reformulated gasoline programmes argue that only a fraction of the motor pool causes high emissions. In their view, a programme which removed these vehicles from the road, and increased fuel efficiency in remaining vehicles, would eliminate the need for

reformulated gasoline.

They cite an EPA report, published in October 1992, which showed a drop in pollution levels between 1982 and 1991 of ambient smog, lead, sulphur dioxide, carbon monoxide and nitrogen dioxide. In addition, they note that of the 97 areas identified in 1990 as not meeting ground-level ozone standards, 41 now comply, as do 13 of the 42 non-attainment areas for carbon monoxide.

It is highly unlikely, however, that these critics will be able to quash the reformulated gasoline programme. On the other hand, they may be able to cause delays in the finalisation of the complex model, and perhaps affect its definition. A lot still needs to be decided. ■

California – Phase 2 reformulated gasoline 1996

Property		Per gallon compliance
RVP	(pounds/square inch).....	7.0 max
Oxygen	(% weight).....	1.8 min., 2.2 max.
Sulphur	(parts/million)	40
Benzene	(% volume).....	1.0 max.
Aromatics	(% volume).....	25 max.
Olefins	(% volume).....	6 max.
T90	(degree F)	300 max.
T50	(degree F)	210 max.
Result is VOC reduction greater than 40% and toxics reduction greater than 30% of 1990 U.S. average baseline gasoline.		

HALF PRICE BOOK SALE

	Sale Price	Usual Price
Cost reduction offshore - the way ahead. 1989.	£12.50	£25.00
Developments in marketing distribution. 1988.	£9.00	£18.00
Economics of refining. 1987.	£9.00	£18.00
Economics of refining. 1989.	£13.00	£26.00
Optimising the retail network. 1989.	£7.50	£13.00
Petroleum retailing -after the Monopolies Report. 1990.	£9.00	£18.00
Petroleum retailing: Europe and the UK. 1987.	£11.00	£22.00
Petroleum retailing in the 1990's. 1988.	£11.00	£22.00

Members still get a 25% discount. Strictly cash with order for these sales bargains



Please make cheques payable to Institute of Petroleum and send to:
The Library, Institute of Petroleum, 61 New Cavendish Street,
London W1M 8AR. Tel: 071-636 1004. Fax: 071-255 1472 (for Credit Card Orders)

Ecuador leaving OPEC frees up major expansion plans

By John Cranfield

Simple economics were behind Ecuador's decision to leave OPEC towards the end of last year. As one of the cartel's smallest producers, the country had a hard enough time making ends meet when oil output was at a peak. But ceilings imposed by OPEC held production back to the point where income could not keep pace with outgoings. Even the subscription paid to the organisation – some \$2 million a year – was a severe drain, for which no tangible benefit was received.

Now, with the shackles off, the country is setting itself up to make the most out of its oil and gas reserves. In that it is getting willing help from a wide range of oil companies, both big and small. For the country has something to offer everyone, from minute fields best run profitably by the small operator, to the large fields buried deep in jungles that need massive resources to tap.

Under the OPEC ceiling, Ecuador was supposed to produce no more than 273,000 barrels a day (b/d). While that might have been worthwhile when oil prices were over \$30 a barrel, in recent years Oriente export blend has been selling at not much more than half that. Actual production has long run at somewhat above the OPEC limit, with exports being maintained at about 200,000 b/d. The result, roughly, is an income of just over \$1 billion a year. Yet bank debt is \$6 billion. Now moves are afoot to get the debt rescheduled. With oil production almost doubling under current plans, that should bring the country's economic affairs back towards equilibrium, though much depends on just how much access to EC consumers Ecuador can get for its other major exports, bananas. Nevertheless, the move to quit OPEC will bring great economic benefits, not least from the spate of new firms wanting to join in the development of the country's oil and gas fields. Under OPEC constraints, the government could not put enough cash by to pay for new development, neither could it attract enough outside investment because of the limit on production.



Extensive exploration over recent years has hugely improved Ecuador's economic situation, raising oil reserves from 1.46 billion barrels to 4.3 billion barrels

Last year, production averaged around 311,000 b/d. But output was climbing throughout 1992 from a January figure of 295,000 b/d, reaching 320,000 b/d by December. This year, output is set to rise a further 60-70,000 b/d, giving perhaps 390,000 b/d by year-end. Over the following two years a further 100,000 b/d is scheduled to be added to output, suggesting 490,000 b/d for end-1995. Petroecuador is, however, banking on 450,000 b/d doubtless allowing for decline in some older fields. This steady boost in output has already hiked export earnings substantially, since home demand is more or less stable at around 120,000 b/d. That could, however, change since hydro-electricity generation has been hard hit by drought and more oil than usual is being used in thermal plants. To counteract this, the government introduced daylight-saving time late last year, hoping to save \$9 million a month in fueloil costs.

With crude exports climbing as output increases, Ecuador has strengthened its economic position. But crude prices are volatile, while the added value from refining accrues to the buyer. So Ecuador now plans a major move into the refining sector, eventually building sufficient capacity to handle all current targeted crude production, and even the slightly more hazy predictions above 500,000 b/d being made for the late 1990s.

Expanding productive capacity

The steady rise in output through 1992 can be partly traced to expansion in the capacity of the Trans-Ecuadorian Pipeline. Boosted capacity from early 1992 is 325,000 b/d, the extra 25,000 b/d being achieved by the use of new pumps in the booster stations at Lago Agrio, Lumbaqui, El Salado, Baeza and Papapacta. The project cost \$6.7 million and caters for additional oil flows from fields in the Amazonas area. Some months later, a \$14 million gas-injection programme on El Libertador field, 35 kilometre distant from Lago Agrio, allowed oil output to be boosted by 47,000 b/d. Integrated with the Carabobo, Paracayacu, Pinchincha, Secoya, Shuara and Shushuqui fields, El Libertador also feeds 10 MMcf/d of gas to the Shushufindi gas-processing plant yielding 70 tonnes a day (t/d) of NGL. Expansion at Shushufindi was also completed early last year, the \$10 million scheme being targeted to raise LPG output from 120 t/d to 500 t/d.



Failure of the Shushufindi LPG-processing plant to reach full capacity means that Ecuador will continue to import LPG for some time to come. Hope was that the plant would produce 80 percent of the country's needs, after expansion, in place of the previous 50 percent.

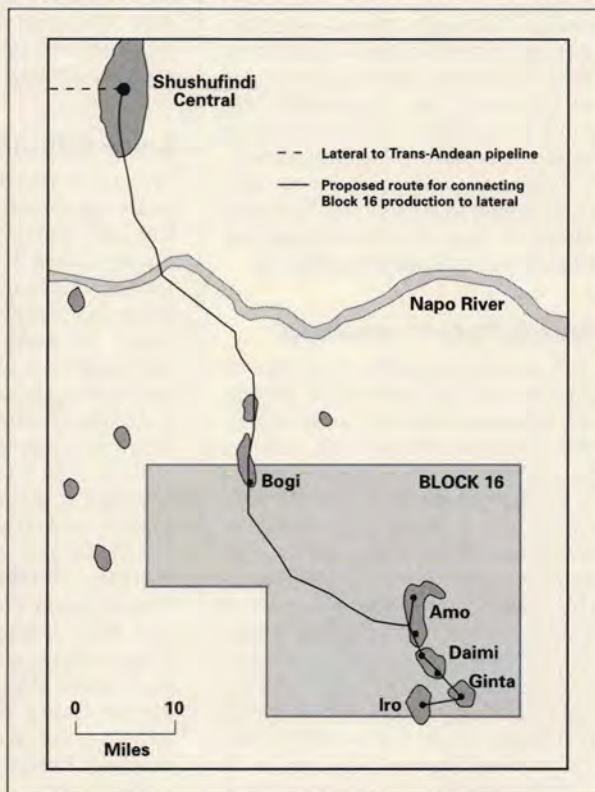
However, the plant has yet to produce at capacity, 175 t/d reportedly being the best so far, seemingly because of design problems.

As long as Ecuador was constrained by OPEC on the volume of crude it could produce, there was little point in expanding capacity. Any substantial investment was of dubious financial viability since the required return could not be generated. That has changed. One of Petroecuador's first moves when OPEC membership was dropped was to plan further expansion of the Trans-Ecuadorian Pipeline. A new pumping station at Lago Agrio will boost capacity to 400,000 b/d, while negotiations began on the possibility of Ecuador leasing capacity on Colombia's Transandean Pipeline to allow more crude to be shipped out.

New production will come from several areas. Late last year, 16° crude began to flow from fields near the Peruvian border, where 237 million barrels have been found by Petroecuador in the new Pishtingo field. This, with the Imuya and Sabalo

y Pauji fields, makes up the Tiputini production unit. Costing £280 million, development is expected to result in a flow of 45,000 b/d through a 300 km line to Lago Agrio, the heavy crude being first blended with 30° oil from the nearby and similarly sized Tanacocha field to give a 25° export blend. Another 30,000 b/d is set to come by August from Occidental's Block 15 discoveries south of Shushufindi. The new fields – Laguna, Limoncocha, Indillan-Itaya and Jivino – are being linked to

Maxus' Block 16 project



existing export systems via a 27 km spur. Start-up is set for mid-year at 15,000 b/d. At a cost of \$250 million, the development – requiring 38 wells – will tap 225 million barrels of 29° crude.

Elf, too, has won a production permit, for an initial 6,000 b/d of 18° oil from finds in Block 14. A pipeline will link the Sunka-Wanke field to existing outlets and crude should flow by mid-year. Also this year, Maxus expects to start production from Block 16 fields – including Amo, Bogi, Daimi, Ginto and Iro. Cost is \$590 million, the project involving the drilling of 120 wells and the laying, by Brown & Root, of 317 km of pipelines. One, 132 km long, will move diesel oil to field sites, while a 185 km line will move 17° crude to Shushufindi and Lago Agrio for blending prior to export. Reserves are put at 216 million barrels. Initial flow, says Maxus, will be some 22,000 b/d, building up to 50,000 b/d. High cost is partly explained by the need to drive 94 miles of new road into the area, which is virtually virgin territory. Tax breaks will help.

Tripetrol also has development permission, for its Santa Elena fields in Block 1. There, crude is expected to flow at 7,500 b/d from the Mata and Pacoa fields. Development will cost \$27 million, involve drilling 22 wells and tap an estimated 50 million barrels, says Tripetrol General Manager Alonso Solgado. Less optimistic is the situation in Block 12, where British Gas pulled out last year. The Danta field was found, but despite holding 50 million barrels, was said to be uneconomic. However, prior to agitation by local Amer-Indians about oil industry activity in their ancestral homeland, the field was reckoned commercial.

Search boosts reserves

Until recently, Ecuador's oil reserves were put at just 1.46 billion barrels, with exhaustion expected around 2010. With the spate of new finds, reserves are now put at 4.3 billion barrels, by L' Institut Francais du Pétrole, which has a study role with the government. This tripling will not only sustain a higher output rate but sustain it for much longer. Unhappily, much of the new crude is heavy. Early last year, the US-based East-West Center predicted that heavy crude output would hit 96,000 b/d in 1995. Cut with 29° Oriente crude, this would provide export-blend sales of 81,000 b/d. Overall crude production would peak



The spate of new field developments will make Ecuador's one of the world's drilling hot-spots over the next few years, with hundreds of wells planned.

at 342,000 b/d in 1995, but decline thereafter as Oriente supplies declined. Such figures are now clearly out of date, while new concession bids due in April should open up much under-explored territory.

Local refining option

While a renewed search may turn up more light oil, the current trend towards heavy crude is worrying. Exports may have to be cut back, unless buyers can be persuaded to take much heavier crude. Given that the latter is unlikely, Ecuador has embarked on a major upgrading of its own refining sector to make best use of available resources. Late last year, Petroecuador announced a \$520 million plan to upgrade two of the country's three refineries. Esmeraldas capacity will be hiked from 90,000 b/d to 110,000 b/d, while La Libertad will rise from 38,000 b/d to 55,000 b/d. The resultant 165,000 b/d will cope with local demand for the foreseeable future, especially when the 10,000 b/d ex-Repetrol plant, near to La Libertad on the Santa Elena Peninsula, is added in. But an export refinery would produce benefits from the sale of added-value products abroad.

Back in 1990, the Repetrol plant was eyed for major expansion as part of a plan to raise refining capacity by 200 percent. Then Petroecuador President Luis Roman saw the Santa Elena Peninsula as the ideal place for an export plant. Nothing came of either plan, possibly because the site is remote from the export pipeline terminal at Esmeraldas. Bids have been sought for an export plant with a capacity of 210-340,000 b/d, using modern technology to handle heavy oils. Location has yet to be firmed up. In addition, plans are gelling for upgrading units to be installed at Esmeraldas to handle heavy crude, delivered as a blend with light oil. This project will presumably follow on from basic capacity expansion.

One problem that has tended to snarl up development plans in recent years is the high turnover in Energy Ministers. Since the start of 1990, there have been five, the latest resigning early this year. Just which way the new incumbent aims to go will become clear in due course. But with freedom from OPEC constraint, and with far greater reserves to exploit, the new minister has everything going for him. ■

APEA companies seek government tax review

By William Scholes

Australian petroleum companies are being forced to invest overseas in areas where tax regimes are more favourable. A survey conducted by the Australian Petroleum Exploration Association (APEA) and released at its 33rd annual conference at Surfers Paradise, Queensland in March showed overseas spending by local companies in 1991-92 jumped 42.2 percent from \$A654 million to \$A930 million. That accounts for about a third of all capital spending by petroleum companies and represents a doubling of funds spent overseas during the past 10 years. APEA executive director Dick Wells said that in real terms exploration had fallen from between 60 percent to 70 percent during the past 10 years.

Delegates at the APEA annual conference, the biggest industry gathering in the Southern Hemisphere, were told the petroleum industry's effective after-tax return on funds had fallen from 16.1 percent in 1990-91 to 11.3 percent in 1991-92.

This meant that one-third of Australia's oil and gas sector's exploration budget was spent overseas. The survey concluded that the loss of exploration dollars reflected the relative prospectiveness and risk/reward assessments made by Australian companies.

Tax was identified by APEA as the major reason for the shift overseas. The survey showed that 62 percent of the industry's 1991-92 profit was handed over to government in the form of direct taxes but there were other factors. These included the continuing difficulty of smaller exploration companies to raise cash from the equities market to fund their exploration efforts and land access issues.

Increased production during 1991-

92 was offset by the continuing decline in crude oil prices so that industry operating revenue fell 11 percent to \$A7.3 billion. Net profit fell 34 percent to \$A1.3 billion.

Mr Wells said that Australia's oil and gas exploration industry was facing tough international competition for scarce capital.

APEA intends to take advantage of the appointment of Michael Lee, the new Federal Resources Minister, by reaffirming many of its principal aims, primarily the modification of the Petroleum Resource Rent Tax (PRRT) to make Australia more attractive for the world's oil explorers.

Mr Wells said that even the smallest Australian exploration companies were beginning to target foreign countries to limit the risk of exploration. Companies were seeking more favourable taxation regimes, generally on offer in many developing nations as those countries try to attract vital foreign capital to build and sustain their economies.

Gas tax objection

Mr Wells conceded that the introduction of PRRT in 1989 had brought many benefits to the domestic oil industry and made Australia a significantly more attractive place to spend exploration dollars but the Federal Government needed to address some problems within the existing legislation.

One of the big problems with the PRRT system, according to APEA, is the imposition of the tax system on gas production.

The APEA survey of oil companies in Australia revealed an average tax rate of 62.5 percent of profit, compared with 70.8 percent in 1989-90, when PRRT was introduced. That tax rate compared with just 58 percent of pretax profit levied on Australia's mining companies.

According to Federal Budget papers, \$A876 million was paid in PRRT in 1991-92 and it is estimated that \$A1,002 million will be paid in 1992-93.

Tax collections under the PRRT system are forecast to rise in coming years as more new fields are developed and pass the tax-paying threshold which gives companies a tax holiday in the early life of new fields.

APEA chairman's views

APEA Chairman and Managing Director of Ampolex Ltd. Dr Peter Power told delegates that the

What the oil industry earned

(\$A million)

Aggregate profit and loss

1989-90

1990-91

1991-92

Total revenue

5,097

8,411

7,542

Total operating costs

3,596

5,322

5,340

Pretax profit

1,501

3,089

2,202

Less: Tax

641

970

817

Net profit after minorities

830

1,983

1,311

continued growth of the industry was far from guaranteed. He pointed out that low oil prices and poor rates of return gave little room for optimism.

As a result, a maximum of 70 onshore exploration wells are expected to be drilled this year, compared with 227 a decade ago.

Although fluctuations in oil prices have played a large part in the plight of the onshore industry, Dr Power said that governments had to bear some responsibility because of the relatively high taxes that applied to the oil sector.

The industry also wants to win relief from capital gains tax on non-cash farm-out deals, which acts as a major disincentive to onshore exploration efforts.

Oil and gas production in Australia contributed almost \$A10 billion to the balance of trade in the form of export earnings and import replacements. While Australian oil and gas production is set to rise over the next three to five years, crude oil imports were also set to climb sharply from the current level of about 260,000 barrels a day to more than 430,000 b/d by 2004-5.

By that time many of Australia's older fields will be in serious decline and – in the absence of new discoveries – national output is likely to be falling.

New permits offered

Nine new offshore exploration permits have been offered by the Federal Government, six of which are located near existing oil and gas producing fields.

The main attraction lies in four permits adjacent to the North-West Shelf.

Mr Lee said it was essential that offshore regions were thoroughly explored and he intended to maintain a steady programme of releasing new acreage for exploration.

One other permit has been released off the south coast of Western Australia in the Bremer basin, a rank wildcat permit in which no drilling has ever been conducted and very little seismic exploration undertaken.

Two permits west of Darwin in the Ashmore/Cartier Islands region have also been released. These two permits lie close to the existing Jabiru/Challis/Skua oilfields. They were most recently held by BHP which relinquished much of the acreage as part of the usual procedure of dropping areas which are surplus to its exploration programme.

The other two permits on offer are

in the eastern Timor Sea, about 300km north of Darwin. Previous exploration in the region has revealed the Evans Shoal gas discovery, providing some incentive for new explorers to rework earlier exploration efforts.

The conference learnt that the production of more than 100 million barrels of oil in Bass Strait had been delayed because of escalating costs in the small Bream field, which contains 18 million barrels of oil. Bream B was expected to cost around \$A240 million to develop using a

concrete gravity structure. But overrun in the budgeted cost of development has forced Bass Strait operator, Esso Australia Ltd, to consider other development options. These include the use of a floating production and storage facility or even subsea completion techniques linking the field back to the existing Bream field platform. No final decision has yet been made, although Esso is still keen to utilise the concrete gravity construction proposal, although in a modified and cheaper form.

The other planned Bass Strait

development, West Tuna, containing 86 million barrels of oil, at a planned cost of about \$A560 million is set to proceed, also using a concrete gravity type platform.

However the final go-ahead depends on Esso completing a labour agreement with unions in Woollongong, New South Wales, where the concrete platforms will be built. Esso wants to build the platforms in the concrete casting facility built and

used to make the massive Sydney Harbour tunnel components. Once the labour agreement is in place, West Tuna is likely to proceed immediately with an expected construction

time of about 18 months.

Esso is still considering options for the future development of the Blackback/Terahiki oilfield, containing about 80 million barrels of oil. The field stands in 300 metres of water but the sea floor slopes to 600 metres at the edge of the field, presenting Esso with major engineering challenges in designing a suitable production facility.

Esso's small Moonfish field discovery in Bass Strait, much closer to shore, is also under active consideration for commercial development. ■

'Low oil prices and poor rates of return gave little room for optimism'



Personnel Education &
Training Discussion Group

'Equal Opportunities and the Oil Industry'

Evening Meeting, Wednesday 9 June, 1993
5.15 p.m for 5.45 p.m

Lois Leeming, Campaign Development Manager, Opportunity 2000
Jill Kenny, Plant Manager, West London Terminal, Esso UK

will present short talks on the goals organisations can set in order to help ensure they have a balanced workforce of men and women, the benefits to their business of such a workforce together with a personal view of the practicalities and experience of equal opportunities. The presentations will be followed by an informal question & discussion time.

Chaired by Derek Forrest - General Manager, Human Resources, Texaco Ltd.

Staff of member companies, individual members, guests and those interested in the future of the oil industry will be most welcome. Please call Bob Edmondson at the Institute of Petroleum (tel: 071 636 1004) if you or your colleagues plan to attend.



THE INSTITUTE OF PETROLEUM



Background Courses



Introduction to Oil Industry Operations

Wednesday 23 June – Friday 25 June 1993

This course is designed as a general introduction to the upstream and downstream activities of the oil industry and may be particularly valuable to companies who do not hold their own in-house induction courses covering these subjects. It is likely to be appropriate for:

Participants from within the oil industry whose experience is limited to one function of the industry and who require a wider perspective of the industry's activities.

Participants from financial institutions, government, other energy industries and the supply and service industries who require to obtain an informed and concise 'bird's eye view' of the oil industry.

Topics to be covered during the three days will include:

- *Changing Perspectives in the International Oil Industry*
- *Petrochemicals*
- *Basic Concepts of Drilling*
- *Research Activities in the Oil Industry*
- *Petroleum Production*
- *Introduction to Marketing and Distribution*
- *Supply*
- *The Retail Market*
- *Refining*

This is a self-contained course but is followed by:

Introduction to Petroleum Economics

Monday 28 June – Wednesday 30 June 1993

This course is designed as a general introduction to the economics of the oil industry and may be particularly valuable to companies who do not hold their own in-house induction courses covering this subject. It is likely to be appropriate for:

Participants from within the oil industry whose experience is limited to one function of the industry and who require a broader perspective of the economic factors affecting the industry.

Participants from financial institutions, government, other energy industries and the supply and service industries who require to obtain an informed and concise introduction to the economic and commercial background to the industry.

Topics to be covered during the three days will include:

- **Structure of the Oil Industry**
 - Development of Major Oil Companies*
 - The National Oil Companies*
 - The Role of the Independents*
- **Geopolitics of Oil**
 - OPEC/Middle East*
 - Eastern Europe and the Former Soviet Union*
 - Asia and Pacific Region*
 - North America*
 - North Sea Basin*
- **The Oil Markets**
 - Product Markets*
 - Crude Oil Markets*
 - Oil Price Information*
 - Oil Futures Market*
 - Oil Supply and Price – The Outlook*

For copies of the registration forms for both courses, please contact Caroline Little, The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR. ☎ Tel: 071-636 1004. Fax: 071-255 1472

Ergonomic design to prevent accidents

Human operators are crucial to safety in the high-risk worlds of nuclear power, electricity supply and petrochemicals and ergonomists are leading the way in identifying how they can be helped to be more dependable.

Ergonomists recommend that, rather than losing lives, plant and property in disasters later attributed to human error, industry should plan for human fallibility and build in routines which can mitigate the consequences of mistakes or failures of technology.

Recent work shows that Human Dependent Failures (HDFs) can, to some extent, be predicted and avoided, if research now being carried out is applied.

After an explosion in Houston, Texas in 1989, the US Occupational Safety and Health Administration (OSHA) predicted that 100 incidents each year could be expected in the petro-chemical industry, leading to 53 deaths, 985 injured and 18,000 people evacuated from their homes. Many such incidents would be attributable to human factors such as inadequate training, insufficient recognition of hazards or unsafe practices.

US Ergonomist Daniel Welch of Carlow International Incorporated states: 'Public response to similar estimates for the nuclear power industry could be easily predicted. Emphasis must be placed on the human operator as the critical safety system. This mind-set is basic to all ergonomics related system improvement and is a necessary first step in developing a culture of safety in industry. It requires placing the human factor on an equal plane with equipment integrity, management approach and other elements viewed as important.'

A study by Dr Ian Glendon of the Human Factors Research Unit at Aston Business School, Birmingham, makes recommendations as to how ergonomics can reduce risk by cutting down the probability of errors or by mitigating the consequences of errors which do occur. Ergonomists could be involved in workplace design, engineering controls and procedures, reporting systems, safety auditing and employee involvement, for example.

Papers relating to energy, human error and risk at the Ergonomics Society's Annual Conference include: Human error incidents in the electricity supply industry; Ergonomics in nuclear power and process safety; Human dependent failures; and Appraisal of the Piper Alpha disaster.

Chimney demolished by water power

For its first concrete cutting application in Singapore, CSM Engineers has designed and maintained a Kamat K3300 high pressure water pump, powered by a Scania DSC14 diesel engine, together with sophisticated pneumatic and electronic controls and safety features to be used to demolish a 130 metre high reinforced chimney stack at Singapore Refining Company.

Use of this relatively new technology in South East Asia, with the regions largest water pump, has been introduced by Singapore-based CSM Engineers.

The company expects to demolish the chimney within two and a half months having trained its operators to use the pump in its first application.

Environmentally clean, with no dust or vibration, high pressure water is pumped at 900 bar and 140 litres a minute through a lance to provide the cutting power.

CSM were aware of the critical nature of the project with the close proximity of 'live' refinery pipes and boilers around the stack. Water cutting was thought to provide the safest and fastest option.

Initial cuts were made into the base of the stack to

prepare a large 4 metre x 2.5 metre opening to remove the interior refractory brick lining. Using the opportunity as the learning period, the operation took less than one day compared with the lengthy times using conventional wall saws or jack hammers and with the corresponding environmental hazards of dust, noise, sparks and vibration.

The Scania DSC14 diesel engine, producing 461 hp (339 kW) at 1,800 r/min ensures that the Kamat pump with its forced-oil lubrication system, steplessly adjustable pneumatically driven pressure regulator and remote-controlled safety valves is able to produce the necessary power for this particular application.



Improved range of higher accuracy dead weight testers

Budenberg are renowned as manufacturers of high quality pressure gauges, particularly since the introduction of the new Premium Range. What is sometimes overlooked is their involvement in the field of dead weight testers.

Budenberg claims to be the only manufacturer of dead weight testers in the United Kingdom to have NAMAS accreditation for pressure, area and mass.

As part of their programme of continuous improvement, Budenberg have introduced two new series – the hydraulic 480 Series for pressures up to 1200 bar and the air-operated 450 Series for pressures up to 120 bar – both of which offer high accuracy and several unique features.

Normal accuracies have been enhanced to 0.025 percent of reading and testers

are also available with Class A calibration accuracies to 0.008 percent.

Normal accuracies are achieved without having to match each weight with the piston cylinder unit, which means that additional weight sets can be added later without the inconvenience of returning the piston unit for re-evaluation.

More important is that all testers have dual range piston

units in one column which cover the whole range without the need to change pistons.

Stainless steel weights are supplied as standard and each range is available in four pressure units – bar, kPa, lb/in² and kg/cm². Fine increment weights are also available.

All Budenberg Dead Weight Testers are supplied with a three-year guarantee.

High pressure relief valve

Safety Relief Valve specialist Crosby Valve & Engineering, has introduced a new version of their JPVM pilot operated pressure relief valve for high pressure liquid or gas applications.

The JPVM pilot valve is capable of handling set pressures up to 6170 PSIG (425 Bar g) and can operate within a temperature range of minus 40F to plus 400F.

The valve is a modulating, non-flowing pilot type design which limits flow through the pilot to the minimum amount required to operate the main valve. There is no flow through the pilot while the main valve is fully open and flowing.

Other design features and benefits include, top entry main valve for ease of maintenance plus easily removable nozzles for each standard orifice area which eliminates the need for special removal tools or lifting instruments.

The valves are of rugged construction with bracket mounted pilot, one piece main valve body with integrally cast flanges and can be supplied with a range of elastomer seals.

Pressure sensing valve

A 3-way pressure sensing valve adjustable over a wide range of pressures from four to 9,000psi with a repeatability of +/- one percent has been introduced by Amot Controls Ltd. The model 4423 valve can be tailored to customer requirements in a variety of oil and gas, petrochemical and process applications.

A modular design is employed with four different springs and sensing heads giving 16 pressure ranges. A Viton diaphragm is used for sensitive pressures and the higher ranges are proof tested to 10,000psi. The valve's body and internals are manufac-

Fluid loss reducing agent

AVEBE of Foxhol, The Netherlands, has developed a new fluid loss reducing agent for use in the oil and gas industry. The new product, Stabilose HTL, is a low-viscosity carboxymethyl polymer which is suitable for wide application in water-based drilling muds.

The outstanding feature of Stabilose HTL is that the product is thermally stable up to a temperature of 140°C. Therefore, its thermostability is generally better than that of CMC-based products. The new AVEBE product can be used for drilling boreholes to a depth of 5,000 metres.

Stabilose HTL has excellent suspension characteristics and is readily soluble without the risk of lumping. As a filtration control agent, the new product is universally suitable for widely varying drilling conditions, and it is applicable for both onshore and offshore operations. Furthermore, the product has a high level of fermentation stability.

Stabilose HTL has been successfully applied both offshore and onshore in drilling test boreholes in the North Sea and in Germany.

tured from 316 stainless steel.

The Amot valve is easy to install in panels, manifolds and piping without dismantling. The unit can be adjusted externally and has a lockable assembly to give set point security. Maintenance requirements are minimal with an annual inspection normally only necessary.

A typical application for the valve is sensing well head pressure, initiating shut down or alarm conditions should pressures move out of the tolerated range. The unit can also be used for pressure sensing in corrosive environments and for pump suction and discharge.

Rig test control system

Ethyl Petroleum Additives Ltd has commissioned Farnborough-based systems engineering house, Tekhne Ltd to develop a computerised system to monitor and analyse the effects of transmission oil additives. This information will then be used to develop new gearbox oils for commercial and private vehicles.

Based on Tekhne's PC-based TRAC030 test rig control system, the new rig measures the effects of different oil additives by evaluating the friction between synchromesh cones during gear changes. It continually monitors and records the torque and force during synchronisation to calculate the co-efficient of friction at each stage.

During testing, a gear change occurs every 2.5

seconds, with a full evaluation involving 100,000 changes. This takes place during a continuous 24-hour cycle over a period of 5.5 days. Alternatively, a preliminary analysis lasting just one day can be conducted to assess whether or not the additives should undergo a full evaluation.

Extensive data on the gear changes is collected and a summary of each change is stored on the PC unit to provide a manageable level of information to be reviewed. Data can be viewed real-time, or stored on disk and retrieved for future analysis. Information and evaluations can be displayed in a variety of formats.

As a safety precaution, if the system detects several bad gear changes the system shuts down automatically.



Cooper Energy Services' Ajax-Superior Division has introduced a low emission technology for its line of Ajax integral engine compressors. Low emission (LE) technology is available on new Ajax units or in retrofit kit form for existing equipment, for both 13.25 inch and 15 inch bore Ajax models.

LE technology is based on combustion modification in order to achieve emission control, which avoids the addition of troublesome catalytic converters, high-tech controllers and turbochargers. The Ajax ignitor acts as a high energy ignition source - igniting a fuel-rich mixture in the pre-combustion chamber - which jets into the power cylinder for more complete combustion of the lean fuel mixture. The result is lower NOx formation and cleaner exhaust. Ajax LE features also reduce operating costs by reducing fuel consumption, while avoiding expensive fuel pre-treatment.

Shutdown maintenance

A range of sootblower packages has been introduced by Clyde Blowers plc which will provide refinery plant engineers and operators with a 'single source' cleaning solution.

The package for fired heater applications will maintain heat transfer efficiency and availability between scheduled shutdowns. It incorporates long and short retractable multi-jet and rotary multi-jet blowers and is available either with

increased safety electrics or explosion proof specification.

Similarly, a package for boilers raising steam for either power generation or process heating within the refinery includes sootblowers of the long retractable and multi-jet design.

The range of cleaning packages can also be supplied complete with the latest modern PLC control systems which can provide total activity recording and monitoring.

Surveying contaminated ground

Watford-based Contaminated Ground Surveys (CGS) Limited has launched the new Endrive system for site investigations on contaminated land. It is the first system of its type to extract and encapsulate at the same time an entire undisturbed sample, taken from a bore drilled in soft ground. CGS personnel can attend a site fully equipped to take samples for logging on site. Alternatively the samples can be transported sealed and undisturbed to a laboratory for logging and analysis.

Available in handheld and rig-operated versions, the Endrive System is the result of a two-year research project. The handheld version is designed for shallow bores and will drill to depths of 6 metres without a casing, to extract samples ranging in diameter from 38-62 mm. The more powerful rig-driven version is designed for deeper sampling and for this purpose incorporates a temporary bore lining. It will drill to depths of 20 metres and the sample diameter is 62 mm. The sample is collected in one-metre liner sections made of UPVC or other materials specified by the customer.

Volatiles such as entrained solvents and gases are contained within the liners, ensuring they do not escape to the atmosphere. This assists health and safety procedures as well as maintaining sample integrity. Because the liner separates the sample from the drilling system, no special on-site steam cleaning is required and cross-contamination of samples is prevented. A further benefit of the Endrive system is that the complete bore hole can be logged under laboratory conditions, removing the need for an on-site geologist or chemist. The absence of drilling fluids means that contaminant plumes are not disturbed.

The system provides optimum sampling speeds and is not operator-sensitive, which can reduce the cost of site supervision.



Crude dewatering

Recent trials by BP Exploration have demonstrated the use of compact crude oil dewatering equipment. The development of such equipment could lead to drastic reductions in the size and weight of the separator systems needed on offshore installations. Separator residence times could be reduced from several minutes to a few seconds.

The trials, which took place at BP Exploration's Wareham Field in Dorset, were designed to encourage the rapid development and commercialisation of new oil/water separator systems. The new systems should significantly reduce the development costs of new oil fields. There is also considerable potential for retrofitting the equipment to existing installations to improve the performance and/or capacity of existing facilities.

A number of significant technical 'firsts' were achieved during the trials including:

The first in-line field measurements of water droplet size distributions in flowing black oil systems, and:

The first field demonstration of the Electro-Pulse Inductive Coalescer (EPICTM), produced by NATCO. Installation of this in-line device upstream of the test separator significantly improved separation of water from Wareham crude emulsions.

Wax build-up

AEA Technology has launched a multi-client sponsored research programme to tackle the problem of wax and asphaltene build-up during oil production. These depositions restrict flow through pipelines, causing severe operational difficulties and reducing production rates. The research programme will extend understanding of how build-up occurs and can be controlled.

'Until now, because of the difficulties experienced in carrying out deposition studies under field conditions, most experiments have been performed on stock tank crude oil systems at ambient conditions,' explains project manager Paul Birchenough.

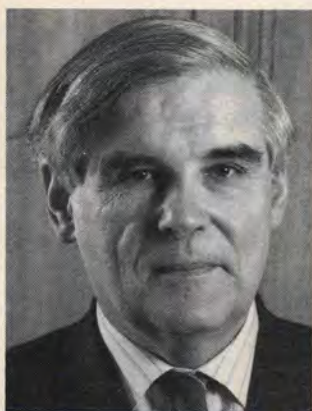
'This gives no real indication as to the likelihood of build-up under typical field conditions or where problems may result in the production system.'

A combined experimental and theoretical programme will investigate the build up of wax. This will allow potential problems to be avoided and, where necessary, give recommendations for remedial treatments to optimise production. Work will concentrate on experimental evaluation of a number of live pipeline oils containing a range of wax contents, thus providing baseline standard tests, compositional and saturation pressure data.

Contacts

AEA Technology	0235 821 111
BP	071 496 4708
Contaminated Ground Surveys	0923 234 481
Clyde Blowers plc	041 952 2161
Tekhne	0252 347 074
Amot Controls	0284 762 222
Cooper Energy Services (Ohio)	+ 614 393 8551
AVEBE (The Netherlands)	+ 5980 42234
Scania (Sweden)	+ 855 383 381
Crosby Valve and Engineering	0858 467 281
Budenberg Gauge Company	061 928 5441
The Ergonomics Society	0602 473 111

... people



The General Committee of Lloyd's Register of Shipping has appointed **Mr Patrick O'Ferrall** OBE, above, as Chairman and **Dr Tim Jones**, below, as Deputy Chairman. Patrick O'Ferrall has been Acting Chairman of Lloyd's Register since the untimely death of Sir Roderick MacLeod in January this year.



S J Berwin & Co have appointed **Mr Geoff Haley** as a partner. He will be joining the firm's specialist Development & Construction Group.

The former manager of Ventures and Development at Conoco (U.K.) Limited, **Mr Jeff Tetlow**, has assumed responsibility for Conoco's activities in developing the Britannia gas and condensate field in the North Sea. He will oversee commercial, technical and operational issues and act as project manager for the field development team.

Mentor Engineering Consultants Limited, a subsidiary of McDermott International Inc., has elected **Mr James J Wildasin** as Chairman of the Board. Also

appointed to the Board is **Mr E Allen Womack**. Continuing as members of the board are **Mr David L Pridden**, **Mr Anthony R Cousins** and **Mr James A Law**.

Mr Edward Osterwald has been appointed as a Principal in Coopers & Lybrand's downstream oil consulting practice based in London. He was previously a Principal in Chem Systems London oil practice.

Mr W J Thomson has been appointed Managing Director of Clyde Blowers plc – the Clydebank based designers and manufacturers of 'on load' boiler cleaning systems. He was previously Business Development Manager.

The Institute of Marine Engineers has elected **Mr Gerald Geddes** as President. He joined the Institute in 1950 and was previously a Council Member, Executive Board Member and Deputy President since March 1991.

Koninklijke Van Ommeren has nominated **Mr H L J M Gieskes** for appointment to the Supervisory Board of Koninklijke Van Ommeren NV at the Annual General Meeting to be held on 12 May 1993. Mr Gieskes will succeed **Mr H F van den Hoven** and **Mr R F de Waal** who are both retiring.

Mr John Bentley, below, has been appointed Chief Executive Officer, Exploration and Production, for Engen Limited. Engen Limited is the Southern African integrated energy company. Mr Bentley will be based in London.



Mr Bill Southgate, below, has been appointed Product Support Engineer by Engine Control Systems. He will be responsible for providing engineering support for products in the UK & Europe, ensuring the continuity of support for Engine Control Systems' sales and for the subsequent development of new products.



Offshore Contractors' Council (OCC) has appointed **Mr Sandy Clark**, Director of AMEC Offshore Developments, as the organisation's new Chairman. He succeeds **Mr David Odling** of AOC International. Mr Odling will continue his involvement with the OCC as a member of the organisation's Board of Management.

Three new commissioners have been appointed to the British Columbia Utilities Commission. **Ms K D Wellman**, **Ms E C Sleath** and **Ms M Ridley Payne** join eight other commissioners appointed to regulate the province's public utilities and carry out special project hearings under the Utilities Commission Act.

The United Kingdom Petroleum Industry Association (UKPIA) have appointed **Mr David Varney** as President. He succeeds **Mr David Clayman**.

Salem Automation Limited has retained the services of **Mr Frank McKenna**. Mr McKenna will perform a technical advisory role as a senior consultant to Salem Automation's Board of Directors.

Sir Frank Layfield QC has been appointed to the Board of Puffin Oil and elected Chairman. **Mr Robin Andrews** is now Deputy Chairman and Mr John Garratt is Managing Director.

Rotork Analysis has recently made three new appointments. **Mr Andrew Knott** has been appointed Operations Director in charge of Engineering and Production. **Mr Mike Powell** takes over as Production Manager responsible for the manufacture of the company's complete product range. **Ms Linda Brewer** joins the company as Sales Engineer for London and the South-East region.

Diamond M-Odeco (Houston) has announced major organisational changes. **Mr M A Childers** has been appointed Senior Vice President for technical services. **Mr L R Dickerson** has been promoted to Senior Vice President and Chief Financial Officer. **Mr T P Richards** has been appointed as Senior Vice President for domestic offshore operations. **Mr J L Gabriel** has been promoted to Vice President – contracts and marketing. **Mr R E McBride** has been promoted to Vice President – onshore operations and **Mr D Williams** is also promoted to Vice President and General Manager of contracts and marketing.

Mr David Streather, below, has been promoted to the position of Standby Batteries Sales Manager for UK and Ireland by Tungstone Batteries, part of the Hawker Batteries Group.



New Collective Members

Aker Engineering plc

69-79 Fulham High Street, London SW6 3JW

IP Nominated Representative: Mr P Cozens, Engineering Manager

Aker Engineering plc is a subsidiary of Aker AS, Oslo, specialising in engineering services, management and procurement for the oil and gas industry, covering both on and offshore developments.

AOC International Ltd

Alba Gate, Stoneywood Park, Aberdeen AB2 0HN

IP Nominated Representative: Mr T M Slattery, Director

AOC International Ltd, a subsidiary of Fairhaven International, Hamilton, Bermuda, is a construction and maintenance contractor to the upstream oil and gas industry. The company's original capability was in the hook-up of new oil and gas platforms. But, as the international energy industry developed, the company responded to the need for specialist, cost effective construction and engineering support, extending its scope of operations particularly into the maintenance and onshore market.

Tomis Oil Maritime SRL

109 Traian Street, Bucharest 2, Romania

IP Nominated Representative: Mr Ovidiu Popescu, Executive President

Tomis Oil Maritime SRL is the largest privately owned independent petroleum inspection company in Romania. Established in 1990, it provides comprehensive bulk inspection services in crude oil and petroleum products/petrochemicals. At present, Tomis Oil Maritime SRL employs 23 inspectors, stationed throughout Romania and in Alexandria, Egypt.

Nippon Oil Exploration (UK) Ltd

Dorland House, 18-20 Regent Street, London SW1Y 4PH

IP Nominated Representative: Mr M Kudo, Managing Director

Nippon Oil Exploration (UK) Ltd is a subsidiary of Nippon Oil Co Ltd, Tokyo, engaged in exploration of the UK Continental Shelf.

ProLoCon (Pty) Ltd

PO Box 131030, Bryanston, 2021, Republic of South Africa

IP Nominated Representative: Mr Andrew Ashton, Managing Director

A subsidiary of Jasco MCI (Measurement & Control Instrumentation), ProLoCon specialises in the design and supply of additive injection systems, terminal automation and associated products and services in the fields of distribution and marketing.

Obituary

Bill Madden, whose death on 2 March, at the age of 86, is reported with much regret, had already retired from Shell, where he was Director and General Manager with responsibility for 'exploration and geophysical', when I joined the IP staff in 1964. As a former member of the IP Council, however, he was a regular attendee at IP events, including the annual dinner then held for past and present members of the IP Council. Although I was a generation younger, he quickly became a good friend, with a mutual interest in music, whose company I sought on those annual occasions and, when I retired from the IP in 1990, he travelled up from Hampshire unannounced, aged 84, and spoke warmly at my farewell.

When he was at boarding school in England in the 1920s, his father was a doctor somewhere near the Suez Canal. At that time, Professor John Cadman, later Lord Cadman, Chairman of Anglo-Iranian and, on two separate occasions, President of the Institute of Petroleum, was travelling home from the middle east and was taken ill on board a liner, as it passed through the Canal. Bill Madden's father was called to treat him. During their short time together, Professor Cadman asked if Dr Madden had any children and what they were studying. As a result, the young Bill Madden was then switched from, I believe, classics to geology which provided the foundation of his future career with Shell. He joined the IP as a student in 1925, when he was probably at the Royal School of Mines.

Derek Payne

Around the Branches

Aberdeen

11th May: Oil Prospects in the Commonwealth of Independent States

8th June: Visit to Peterhead Power Station

North East

11th May: Visit to Hartlepool

Humber

12th May: Blast and Fire Research for Offshore Structures

Midlands

13th May: Fire Prevention. Presentation and tour by the Fire Department, Birmingham

London

18th May: The Application of Horizontal Wells in Oil & Gas Development

Shetland

18th May: Vietnam Potential

15th June: Shetland Towage - Tug Operations at Sullom Voe

Southern

15th June: Visit to the Petroleum Centre, Royal Ordnance Corps, Wimbourne

Yorkshire

16th June: Golf Tournament - Otley Golf Club

New Fellows

Mr D W Brown

Mr D W Brown joined BP Llandarcy upon graduating in Chemistry in 1966, transferring later to BP's Kent Refinery and the British Pipeline Agency. In 1985 he joined BP Oil UK as Employee Relations Manager and subsequently as Distribution Division Manager. In 1992 he assumed his current position as Manager, Health, Safety & Environment, BP Oil Europe, where he has responsibility for the development, communication and support of health, safety & environmental policies and strategies for BP Oil's downstream operations in Europe. Mr Brown was the first Chairman, in 1991, of the IP Downstream Operations Committee.

Mr H W P Gädke

Mr H W P Gädke has a Dipl Ing in Mechanical Engineering and a MSc in Airport Planning. He joined Air BP Hamburg in 1968 as Aviation Engineer, holding various positions with the company in both Hamburg and London, and culminating in his appointment as Chief Development Engineer. He was appointed to his present position as Technical Manager for Aviation Fuel Services (AFS) in 1986. Mr Gädke represents The Euro Aviation Fuelling Group (EAFG), members of which are Statoil, Neste & AFS, on the IP's Aviation Committee, which is the principal standard setting body for aviation fuelling operations outside North America.

W S H Laidlaw

With an MA in Economics & Law, Mr Laidlaw started his professional life as a Solicitor. After achieving an MBA in Business Administration, he joined Amerada Hess Corporation in 1981 as Manager, Corporate Planning, becoming Vice-President two years later and Managing Director of Amerada Hess Ltd two years after that. In 1992 he became Executive Vice-President and Managing Director of Amerada Hess Corp and Amerada Hess Ltd, respectively. In 1991 Mr Laidlaw was President of UKOOA.

Institute News

Dr A F Mitchell

Following a BSc in Biological Sciences and a PhD in Microbiology including consultancy work on a range of microbiological problems and the development of novel biocide screen techniques, Dr Mitchell joined Petrolite Limited in 1985. In his current position as Regional Technical Manager he is responsible for the provision and co-ordination of on and offshore technical support to the European region sales force for oilfield speciality chemicals and services, management of onshore laboratory facilities and quality management for the company's Aberdeen base.

Mr K H Taylor

Upon gaining a Doctorate in Chemical Engineering in 1964, Keith Taylor joined Esso at its Fawley Refinery, holding various management positions with Esso Petroleum, Esso Europe, and Exxon Corporation, before being appointed Managing Director of Esso UK plc in 1985, responsible for oil and gas exploration and production in the UKCS and for natural gas marketing. Early this year Mr Taylor was appointed Chairman and Chief Executive. He is a Vice-President of the Institute of Petroleum.

Mr D R Varney

Mr Varney joined the Shell Refining Company in 1968, following a Bachelor degree in Chemistry. He spent two years at Manchester Business School, gaining a Master's Degree in Business Administration, thereafter holding senior positions with Shell in Australia, Holland, Sweden and the UK. He was appointed a Managing Director on the Board of Shell UK Limited in December 1991, with responsibility for Shell UK's downstream activities, covering oil marketing, distribution, supply, refining and trading. Mr Varney is a Vice-President of the Institute of Petroleum and President of UKPIA.

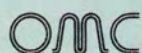
New Members

Dr Y Abrishami, Imperial College of Science, Technology & Medicine RSM., Prince Consort Road, London SW7 2BP
 Mr A J Aitken, Baker Hughes Inteq, Denmore Road, Bridge of Don, Aberdeen AB23 8DZ
 Mr O I Akpata, c/o Claire E Akpata, 89A Brondesbury Villas, London NW6 6AG
 Mr F Aldana Alfonso, Adelita Apt 26, Unidad Independencia, Del Contrebas, 10100, Mexico D.F. 525 Mexico
 Mr J R G Boswall, Cameron Markby Hewitt, Sceptre Court, 40 Tower Hill, London EC3N 4BB
 Mr A J Bryce, Cameron Markby Hewitt, Sceptre Court, 40 Tower Hill, London EC3N 4BB
 Miss C Charles, Sterling Publications Ltd., PO Box 799., 57 North Wharf Road, London W2 1XR
 Mr G C Clifford, Sunnyleigh, St Giles Road, Lightcliffe, Halifax, West Yorkshire HX3 8BG
 Mr A F Coles, 10A Hilliard House, Prusom Street, London E1 9NN
 Mr M Conway, 24 Bourbon Close, Wibsey, Bradford, West Yorkshire BD6 1SN
 Mr S Cook, Burnbank Cottage, Port Road, Inverurie, Aberdeenshire AB51 9SN
 Mr H T Dearden, SGS Redwood Ltd., Unit 9, Rosscliffe Road, Ellesmere Port, South Wirral L65 3AS
 Mr P R T De Kerchove, Airloc S.A - N.V., Office Belgium, Rue Drootbeek 30, 1020 Brussels, Belgium
 Mr P W Dickinson, Alluvial Mining Co Ltd., Milner Road, Chilton Ind Estate, Sudbury, Suffolk CO10 6XG
 Mr S Duff, 9 Mossbank, Chester, Cheshire CH1 4AS
 Mr P J M A Fournier, BHF Bank, BHF Bank House, 61 Queen Street, London EC4R 1AE
 Mr A M Goddard, Esso Petroleum Co Ltd., Esso House, Ermyn Way, Leatherhead, Surrey KT22 8UX
 Mr A M S Green, Cameron Markby Hewitt, Sceptre Court, 40 Tower Hill London, EC3N 4BB
 Mr M Hamed, 186 Homefield Park, Grove Road, Sutton, Surrey SM1 2EA
 Mr M S Harley, SGS Redwood Ltd., Rosscliffe Road, Ellesmere Port, South Wirral L65 3AS

Mr R Henderson, Atlantic Marine Services Ltd., 84 Priory Road, St Denys, Southampton SO2 1HS
 Mr S C Hill, George Meller Ltd., Orion Park, Northfield Avenue, Ealing, London W13 9SJ
 Miss E J House, United Bank of Switzerland, 100 Liverpool Street, London EC2M 2RH
 Mr C H Hunt, 11 Gloucester Square, Whiston Road, London E2 8RS
 Mr K J Ihimoyan, Plot 4B LSPPC, Housing Estate Isolo Box 72578, Victoria Island, Lagos, Nigeria
 Mr A E Jones, Bristow Helicopters Ltd., Forties Road, Aberdeen Airport, Dyce, Aberdeen AB2 0ES
 Dr W L Keenan, 91 Airedale Avenue, London W4 2NN
 Mr L D Killion, Hamilton Oil Co Ltd., Devonshire House, Mayfair Place, London W1X 6AQ
 Mr R A Lane, Yalumba Lodge, Old Meldrum, Inverurie, Aberdeen AB51 0AU
 Mr S M Matthews, 22 Malcolm Road, Bucksburn, Aberdeen AB2 9LN
 Mr G McGregor, Bibby Line Group, Marischal Chambers, Drummond Cnr., Peterhead, Aberdeenshire AB42 6ZP
 Mr S J McLoughlin, 11 Irvine Way, Lower Earley, Reading, Berkshire RG6 4JW
 Mr P A McDonald, Inchcape Testing Services UK Ltd., Wellheads Crescent, Dyce, Aberdeen AB2 0GA
 Mrs D L Mills, 21 Sedgemoor Road, Flackwell Heath, High Wycombe, Bucks HP10 9AU
 Mr J Murdoch, Baker Oil Tools (UK), Woodside Road, Bridge of Don, Aberdeen AB23 8BW
 Mr G J Murphy, 1 Ash Court, 27 Hooley Range, Heaton Moor, Stockport, Cheshire SK4 4HU
 Mrs S Muskett, Andersen Consulting, 2 Arundel Street, London WC2R 3LT
 Mr E W Najjar, Petrol Survey & Technics, Adib Ishak St., Alexander Pharmacy Bldg, Beirut, Lebanon
 Mr G Nicholls, 11 Onslow Gardens, Muswell Hill, London N10 3JT
 Mr B W Pace, Westfield, 19 Fairmile Lane, Cobham, Surrey KT11 2DL
 Mr G G Pyett, Braemere, Jubilee Lane, Burton Pidsea, Hull, North Humberside HU12 9BE
 Mr R Reid, 24 Deyes End, Maghull, Liverpool L31 6DP
 Mrs H M Royle, 30 Frankfurt Road, Herne Hill, London SE24 9NY
 Mr S T Sayer, Richards Butler, Beaufort House, 15 St Botolph Street, London EC3A 7EE
 Mr A J Smith, Balfour Kilpatrick Ltd., 28-42 Charles Street, Aberdeen AB2 3TU
 Mr K J Stump, 14 Canton Road, Middlelease, Swindon SN5 9TP
 Mr S H F Taylor, 2 Owen Street, Rhydyfelin, Pontypridd, Mid Glamorgan CF37 5HU
 Mr G S Thompson, Transtech (Europe) Ltd., Medserv Base, Manoel Island GZR 03 Malta
 Ms G M Vinter, 15 Warren Street, London W1P 5DB
 Mr S Walters, 19A Grosvenor Road, Twickenham, Middx TW1 4AD
 Mr D G Ward, 3 Townhead Road, Inverurie, Aberdeenshire AB5 9RZ
 Mr D Watson, 68 Woodvale, Coulby Newham, Middlesbrough, Cleveland TS8 0JS
 Mr H L Watson, Mobil Oil Co Ltd., Research & T.S Lab., The Manorway Coryton, Stanford-le-Hope, Essex SS17 9LN
 Mr R Webster, 46 Lee Lotts, Great Wakering, Southend on Sea, Essex SS3 0HB
 Mr J L Wenlock, William & Mary Cottages, Witham Road, Cressing, Braintree, Essex CM7 8PD
 Mr B R Westbrook, Cameron Markby Hewitt, Sceptre Court, 40 Tower Hill, London EC3N 4BB
 Mr J W Whitehorn, 12 North Street, Peterhead, Aberdeenshire AB42 6JJ
 Ms K A Williams, Soutron Ltd., Jerome House, Hallam Fields Road, Ilkestone, Derbyshire DE7 4BH
 Mr P J Windebank, Chem Systems Ltd., 28 St James's Square, London SW1Y 4JH

Students

Miss C Anderiz, 103 Westwood Hill, London SE26 6PE



Management consultants in safety, training, emergency response and maintenance. Try us for procedures, courses, exercises and studies. Run by CEng with maintenance background and 15 years management consulting experience.

Mike Charleston
Telephone: 0530 560718

HAYTON CONSULTANCY SERVICES

Listed as consultants under the DTI Quality Scheme. QA Systems to meet BS 5750, ISO 9000, EN2900 requirements tailored to your company needs. Extensive oil/gas industry experience covering all management functions. Total Quality Management consultancy and training.

Tel: 0642-712321. Fax: 0642-710482.

*To advertise on this page
please call Brian Broome*

Tel: 0732-866360



MIKE WARD ASSOCIATES

- Petroleum Industry Consultants
- Network of Skills & Resources
- Technical Support
- Sales & Marketing
- Training
- Personnel Search and Selection
- Cost Effective Service

Employment Agencies
Licence No. M5161

The Rodgelands
Bank Lane, Abberley
Worcestershire WR6 6BQ
Tel: 0299-896 654.
Fax: 0299-896 955.

Experienced and Specialist Services in Marketing

Covering both Fuels and Lubricants - All Markets - Includes Pricing and General Oil Economics Relating to Price Movements and Trends

Brian Sandland,
B S Oil Associates Ltd.,
64 High Street,
Cheltenham,
Glos GL50 1EE,
Tel: 0242 262211.
Fax: 0242 262201



1993 CONFERENCES

- May 19** 'Improving Oil Industry Cost Competitiveness through the Logistics Chain' - Conference
- May 25** 'Petroleum-Based Land Contamination' - Conference
- June 8** 'Current Developments in North Sea Drilling' - Conference
- June 23-25** 'Introduction to Oil Industry Operations' - Course
- June 28-30** 'Introduction to Petroleum Economics' - Course

Autumn Conferences

- Oct 14** Developments in Microbiological Control in Metal-Working Fluids - Conference
- Oct 19** Economics of Refining - Conference
- Nov 4** New Developments in Tank Calibration and Meter Proving - Conference
- Nov 11** Personnel, Education and Training - Conference
- Nov 18** The Information Centre of the 1990s Changes, Challenges and Choices - Conference
- Nov 25** Gasoline Vapour Emission Controls - Conference

*For further information, please contact **Caroline Little**,
The Institute of Petroleum, 61 New Cavendish Street,
London W1M 8AR. Tel: 071-636 1004.
Fax: 071-255 1472. Telex: 264380.*



CONSULTANT LIST

Members of the Institute of Petroleum offer consultancy services in a wide range of petroleum industry subjects. Currently about 450 members offer 52 different categories of expertise.

A handbook of all consultants indexed by category is available from the Institute for £12. (Payment by cheque or credit card with the order.)

Alternatively a list of consultants in any category will be provided free of charge on application (maximum 2 categories).

Additives Technology
Corrosion Technology
Custody Transfer Arrangements
Energy Efficiency
Environment – General
Environment – Marine Pollution
Expert Witness Services
Finance
Fuels & Fuel Technology
Government & EC Relations
Health & Hygiene
Heat Transfer
Industrial Relations
Information Technology
Laboratory & Test Method Advice
Legal Advice
Loss Prevention
Loss Prevention – Marine
Lubricant Technology
Maintenance & Inspection
Management Organisation
Marine Operations
Market Research & Analysis
Marketing – General
Marketing – Operations
Measurement & Fluid Flow

Microbiology
Oil/Gas Economics & Pricing
Oil & Gas Explorations
Oil & Gas Production
Oilfield Chemicals
Oilfield Development
Oilfield Machinery & Equipment
Oilfield Sub-sea Development
Petrochemicals
Petroleum Information Services
Pipeline Planning & Management
Planning & Economics
Plant Design
Project Services & Engineering
Public Relations
Quality Management & Assurance
Refinery Operations
Risk Analysis
Risk Analysis – Financial
Safety
Site Selection & Investigation
Supply & Distribution
Technical Writing
Telecommunications & Networks
Trading & Shipping
Training

Anyone interested should contact Jo Howard-Buxton at the IP, or send a request for the handbook, together with cheque/credit card details to: Technical Department, Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR.
Tel: 071 636 1004. Fax: 071 255 1472.



INSTITUTE OF PETROLEUM

Code of Practice for the Investigation and Mitigation of Possible Petroleum-Based Land Contamination

- This Code of Practice describes the recommended procedure to investigate land for possible petroleum-based contamination and subsequent procedures to assess its relevance and any remedial measures deemed necessary.
- For the purposes of this Code a contaminated site is defined as a site at which hazardous substances occur at concentrations above *Background levels* and where assessment indicates they pose, or are likely to pose an immediate or long term hazard to human health or the environment. *Background levels* in this paper refer to ambient levels of a contaminant in the local area of the site under consideration.
- The Code provides practical working guidelines identifying the stages of a site investigation, assessment of risks to health and the environment and the establishment where necessary of appropriate treatment criteria. In addition reference is made to responsible authorities who should be consulted during the investigation. The authorities are named for England and Wales, (in other countries equivalent would need to be consulted).
- Although the document does not aim to enable the Site Manager or Engineer to carry out a site investigation, it will provide an appreciation of the process of site assessment and *remediation* work.
- It is envisaged that the document will be of particular interest to companies involved in the manufacture, storage, handling, sale, and use of petroleum products and to local authority departments with responsibilities for planning, environmental health and building control or land use.

CONTENTS: Scope; Definition of Objectives; Stages of Investigation and Remediation; Emergency Response and Initial Abatement; Initial Site Assessment; Sampling Plan and Strategy; Field Sampling; Analysis; Site Assessment Report; Risk Assessment; Assessment of The Need for Remedial Action; Remediation; Appendices.

0 85293 124 7

83pp (pr)

April 1993

£39.00/\$62.50

Published by the Institute of Petroleum, UK and marketed by John Wiley and Sons Ltd.

Members of the Institute of Petroleum are entitled to a 25% Discount off the Published Price.

Wiley books are available through your bookseller. Alternatively order direct from Wiley (payment to John Wiley & Sons Ltd). **Credit Card orders** accepted by telephone - (0243) 829121 or dial FREE 0800 243407 (UK only).

Fax your order on: 0243 775878 Attention: **Rebecca Harfield**.

Please note that prices quoted here apply to UK and Europe only.

JOHN WILEY & SONS LTD

BAFFINS LANE, CHICHESTER, WEST SUSSEX, PO19 1UD, UK



WILEY