New Technology Key to future growth says BP

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ABBREVIATIONS

The following are used throughout Petroleum Review:

mn = million (106) bn = billion (10^9) tn = trillion (10^{12}) = cubic feet cf cm = cubic metres boe = barrels of oil equivalent

t/v = tonnes/vear

GW = gigawatts (109) kWh = kilowatt hour km = kilometre sq km = square kilometres

kW = kilowatts (103)

MW = megawatts (106)

b/d = barrels/day t/d = tonnes/day

No single letter abbreviations are used. Abbreviations go together eg. 100mn cf/y = 100 million cubic feet per year.

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Front Cover: The Maersk Curlew in the final phase of conversion prior to its installation on Shell's **Curlew field**



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NEW_{Stream}

Technology is all

Anyone who has ever attended a major oil industry exhibition will have been struck by the sheer energy and ingenuity of the individuals and the companies supplying the industry. This years 'Offshore Europe 97' in Aberdeen was no exception. Some of the innovations launched at the show are described on pages 476 to 478. The number and range of companies involved is testified by the fact that the show's 400 page exhibition catalogue could easily substitute as a directory of North Sea suppliers.

The view that the opening up of the North Sea oil and gas fields revolutionized the industry's offshore technology is an idea that has become hackneyed by constant repetition. It is nevertheless true and a tribute to all those in the industry who resolutely refuse to accept that certain things 'can't be done' or are 'impossible'.

As a result of their determination, doggedness and sheer bloodymindedness the industry can now drill wells that turn corners, meter gas and liquids together, 'see' oil being swept (or not swept) through reservoirs and accurately drill horizontal wells many kilometres long to develop thin or unproductive reservoirs.

When the giant Brent and Forties fields were developed in the mid/late 1970s they were at the cutting edge of the technology in water depths of around 140 metres. In mid-July, Shell brought onstream the Mensa gas field in the Gulf of Mexico in a water depth of 1,615 metres (5,300 feet), a subsea development that feeds gas back via a 101-km tieback to the West Delta 143 host platform. The tieback record holds, but the depth record fell within a month, such is the sheer speed of technological innovation in the industry.

At the Aberdeen show Petrobras E&P Director, Antonio Carlos de Agostini, was able to announce that, in mid-August, a new well in the South Marlim field in the Campos basin offshore Brazil started producing oil and gas from a water depth of 1,709 metres (5,607 feet). Next year the Roncador field in the Campos basin will come onstream, producing from a water depth of 1,853 metres.

The rapid accumulation of knowledge about operating in extreme water depths means that water depth is no longer a significant barrier to field development. The ship-shaped floating production, storage and offtake vessel (FPSO) is coming to dominate the deepwater development market with the tension leg design (TLP) favoured by a limited number of operators. Latest designs, however, which feature triangular FPSOs effectively synthesize the two design concepts.

Less easy to quantify is the way that recovery rates have been rising as a whole series of technical improvements have made their impact. Average UK and Norwegian recoveries are projected to reach 43 to 45% while individual fields, such as Forties, have already exceeded 56% and are on target to achieve over 60% and maybe as much as 70%.

However, with discovery rates declining worldwide, it is becoming ever more important to perfect the technologies which allow recovery rates to be maximized. As the technically demanding offshore areas are expected to contribute around 85% of incremental oil production it is a safe prediction that companies are going to put increasing emphasis on the development of new technology. As the article shows on page 458, the leading companies such as BP already view the development of cutting-edge technology as a core activity and key asset. Chris Skrebowski

Australia targets greenhouse gas emissions

Australia's first Greenhouse Gas Strategy Report indicates that the country's upstream petroleum industry, which provides 55% of Australia's basic energy, reduced its greenhouse gas emissions by 3.6mn tonnes over the six-year period 1990 to 1995 by the pursuit of voluntary 'no regrets measures'. Continued action by the industry is expected to result in a further reduction of 4.9mn tonnes of emissions by 2003.

Australia's energy sector is required to produce the annual greenhouse gas

report following the Australian Petroleum Production & Exploration Association's (APPEA) signing with the Commonwealth in June 1996 of a cooperative agreement on actions to abate emissions. The agreement covers 98% of oil and gas production activities in Australia which give rise to about 3% of total Australian greenhouse gas emissions.

The report also identifies 72 actions that have or will contribute to emission abatement by petroleum producing companies.

In Brief

It has been reported that a new oilbearing structure has been discovered at Kunduzdy, some 400 km northeast of Alma-Atta in southern Kazakhstan. It is the first oil find in the region – all other deposits currently being developed lie in the west of the Republic.

Shell Gabon has struck oil in its Kenguerie Marin offshore exploration permit. The company holds a 60% share in the project which it is jointly developing with the Gabonese State. The Kenig-1 well flowed in excess of 3,000 b/d.

Elf and Angolan national oil company Sonangol have announced a second deep offshore discovery on block 17 near Girassol in Angola. The Dalia 1 discovery well tested at 16,000 b/d.

British Borneo Petroleum Syndicate has paid \$37.5mn to acquire a 60% interest in the Allegheny field development off the coast of Louisiana. The company will also operate the field.

Brown & Root Energy Services' underwater construction company Rockwater has won a subsea facilities contract worth over £25mn for Enterprise Oil's Pierce field development in UK blocks 23/22a and 23/27.

Spanish shipyard Astilleros Espanoles has signed a contract worth \$128.4mn with Brazilian state company Petrobras to build a floating storage unit to the capacity of 1.5mn barrels of oil. The unit is to be located in 1,200 metres of water in the Roncador field in the Campos Basin, offshore Brazil.

France's Total SA started drilling at Iran's Sirri A offshore oilfield last month and plans to bring it on stream next year, according to the Middle East Economic Survey (MEES). It has also been reported that a consortium led by Royal Dutch/Shell is looking to participate in the fourth and fifth phases of developing Iran's South Pars gas field.

Phillips Petroleum Company has joined a study of a proposed Alaska North Slope gas project. BP Exploration Alaska, Arco Alaska, Exxon, Yukon Pacific Corporation and the State of Alaska are already included in the study.

Tullow Oil has received Pakistan Government approval for the gas allocation of the Sara field in East Badin Extension block B. Tullow and its partners will implement the development of the field.



Major gas discovery in Indonesia

Arco has announced proved and probable reserves in excess of 12tn cf of natural gas in Irian Jaya in eastern Indonesia. The Tangguh discovery,located on the Weriagar and Berau blocks onshore and offshore Irian Jaya, ranks as one of the largest natural gas discoveries in the world, states the company. A further 6.5tn cf of possible reserves may also be in place according to Dallas-based independent petroleum engineering consulting firm DeGolyer & MacNaughton.

The project is expected to cost in the region of several billion dollars.

Development plans call for LNG production to begin in time for anticipated increases in market demand in 2003 and, with the Berau Bay region emerging as a major new gas basin, Arco plans continued exploration drilling to assess the ultimate potential of the area.

The Tangguh project adds a third independent production source to Indonesia's two existing LNG production centres in Arun and Bontang. Through its state oil company Pertamina, Indonesia is the largest marketer of LNG in the world with a 50% market share in the Asia Pacific region.

Partners in the Berau block are Arco (48%), Occidental Berau of Indonesia (22.856%), Nippon Oil Exploration (Berau) (17.144%) and KG Berau Petroleum (12%). Arco holds an 80% stake in the Weriagar block in partnership with KG Weriagar Petroleum's 20% interest. Arco is operator of both the Berau and Weriagar blocks.

Windermere field comes onstream

The second and final development well for the Windermere gas field in block 49/9b in the southern North Sea was



Windermere NNM platform

connected to the project's export manifold in August and the field is now in a run-in period with regular deliveries of gas due to start early in 1998.

The development comprises a not normally manned platform (see photo) from where the gas is transported to the Markham ST-1 platform located some 6.8 km away in block 49/5a.

Gas is commingled with the ST-1 production and shipped to the Markham J6A main platform for processing. It is then transported via the existing K13-Extension and K13-Den Helder pipeline systems, operated by Wintershall Noordzee, to the Den Helder terminal in the Netherlands.

The gas is sold to NV Nederlandse Gasunie while the separated condensate is sold locally in the Netherlands.

Windermere is the first field totally located on the UKCS to deliver gas and condensate to continental Europe, states field operator Wintershall (UK).

Turkmenistan's first offshore licensing round

The Government of Turkmenistan presented its first round of international tendering for oil and gas exploration and production in the Turkmenistan shelf of the Caspian Sea in London on 11 September 1997.

A total of 11 prospective blocks, covering 22,600 sq km and containing an estimated 2.3bn tonnes of oil and 1.8tn cm of gas, are being offered. Applications will be accepted until 28 November 1997 and awards are expected to be announced by the beginning of 1998.

The state has claimed sovereignty

over some 70,000 sq km of the Caspian, an area which is estimated to contain some 3bn tonnes of oil and 4.5tn cm of gas.

Neighbouring Azerbaijan, however, disputes Turkmenistan's sovereignty over one of the fields – named Serdar in Turkmenistan and Kyapaz in Azerbaijan. Sovereignty over other blocks is also being disputed by other countries bordering the Caspian. Industry analysts speculate that some foreign oil companies may be reluctant to invest large sums of money before such disputes are resolved.

In Brief

CalEnergy Gas (UK) has signed a Mining Usufruct Contract with the Polish Ministry of Environmental Protection, Natural Resources and Forestry for exclusive gas exploration and exploitation rights in an approximately 13,500 sq km area in the Central Polish Trough around the town of Pila.

BHP Petroleum and Sonatrach have announced a liquid hydrocarbons discovery on the Rhourde Oulad Djemaa-1 well in block 402a in Algeria. The discovery well tested at 5,526 bld. The find will be subject to further evaluation to establish whether it is in an extension of the BSFN-1 well which lies some 10.5 km to the southwest.

Arco reports that its Vorwata gas discovery in the Berau block in eastern Indonesia has 'augmented plans for a major gas development project in the region' as it lies in close proximity to the company's Weriagar discoveries offshore Irian Jaya. The Vorwata #1 discovery well tested at 30 mn cf/d of gas earlier this year while the Vorwata #2 well flowed at 34 mn cf/d and Vorwata #3 at 29 mn cf/d.

Petrozuata, a joint venture company between Conoco and PdVSA subsidiary Maraven, has begun drilling its first well on a 55,000-acre tract in Venezuela's Orinoco oil belt. The \$2.2bn Petrozuata operation plans to drill over 500 horizontal wells in the country to recover 1.5 to 2bn barrels of extra-heavy crude oil over the next 35 years. The crude will be transported via pipeline to the north coast of Venezuela where it will be upgraded into synthetic crude.

The UK Government is backing the land-based disposal of redundant offshore oil and gas installations. Making the announcement, Environment Minister Michael Meacher said that Britain accepted a presumption against sea disposal of such installations. That said, it was made clear that deep sea disposal may remain an option for some heavy concrete installations or damaged platforms too dangerous to move.

Occidental Oil and Gas has acquired three blocks – Keathley Canyon 157 and East Breaks blocks 476 and 477 – in the Gulf of Mexico for approximately \$9.7mn in the latest federal oil and gas lease sale in the US.



Crine call to UK government on taxes

Speaking at Offshore Europe 97 in Aberdeen on 10 September, Francis Gugen, Managing Director, Amerada Hess, and Chairman of Crine Network, the pan industry initiative aimed at reducing costs and increasing competitiveness in the international oil and gas arena, called for the UK Government not to increase taxes on operators, contractors and suppliers working on the UKCS.

He said that while he was 'pleased to see the government is holding an open review of fiscal policy in the North Sea [in a bid to ensure that an appropriate share of North Sea profits are being

UK government fasttracks mandatory EIAs

UK Science, Energy and Industry Minister John Battle has announced that the criteria set out in the latest European Directive which require compulsory environmental impact assessments (EIAs) for offshore developments over specified thresholds will be applied later this year rather than waiting until March 1999. Mandatory EIAs will be required for any oil and gas activity expected to produce at least 500 tonnes of oil or 500,000 cm/d of gas or the installation of offshore pipelines over 800 mm diameter and 40 km long.

Companies applying for consent for projects reaching these thresholds will also be required to give the public access to the EIAs before government approval can be given. 'This will give the public an opportunity to participate and the companies an opportunity to explain what, in fact, they have already been doing for many years to protect the environment,' said Mr Battle.

The UK Government has given its consent for the development of the Pierce field in blocks 23/22a and 23/27 in the central North Sea. The development plan comprises a leased floating production, storage and offloading (FPSO) vessel with oil export via shuttle tankers and produced gas re-injection via three gas injector wells. Contracts have been placed with Statoil for the provision of the FPSO and shuttle tankers and Coflexip for the supply of flexible flowlines and risers. Rockwater will undertake the subsea installation while the Wells Development Alliance will provide integrated well services.

First oil from six producing wells is planned in August 1998 with an initial production of 20,000 b/d. This will be increased shortly after commissioning to a taxed], rather than imposing arbitrary change', he stated that 'it would be tragic if higher taxes were to divert investment funds, depress the oil and gas industry and rob it of a golden chance for export-led growth and employment'.

He also reported that the Crine initiative aims to see the UK-based contractor and supply sector grow to take some 5% of the world market in the next five years. 'Economic growth in this area will produce real increases in wealth which will automatically translate into higher taxable income for government,' he said.

New safety initiative

A new cooperative safety initiative involving the operating and contracting sectors of the UK oil and gas industry has been launched by the UK Offshore Operators Association (UKOOA), the International Association of Drilling Contractors (IADC) and the Offshore Contractors Association (OCA), with the support of the UK Health and Safety Executive. The initiative aims to:

- deliver a 50% improvement in the whole industry's safety performance over the next three years;
- establish safety performance contracts to demonstrate company concern for safety as an equal to business performance; and
- encourage companies to work together to improve the sharing of safety information and good practice across the industry through the active involvement of employees, service companies, operators, trades unions, regulators and representative bodies.

Green light for Pierce North Sea field

plateau rate of 45,000 b/d.

Proven plus probable reserves are estimated at 84mn barrels of oil and 2.2bn cf of gas. Field life is estimated at between five and 13 years from first oil. The project is expected to cost some £150mn over the next five years, some £100mn of which will be accounted for by the lease of the FPSO and associated facilities.

Field partners are Enterprise Oil (operator, 42.7922%), Enterprise Oil Exploration (31.2%), Ranger Oil (15.6%), MOC Exploration (3.7544%), Agip (3.7284%) and Santos (2.9250%). Enterprise increased its total holding in the Pierce field to 74% in April 1997 when it acquired BP's 42.8% stake in the development in return for Enterprise's 24.05% of Amethyst and 13.5% of its interest in Ravenspurn North.

In Brief

Total has taken a 20% equity interest in the production sharing contract for the Absheron block, formerly known as Tagiyev, in the deep offshore Azeri waters in the Caspian Sea. Other partners in the permit are national oil company Socar (50%) and Chevron (30%) which acts as operator. An exploration drilling programme is scheduled for late 1999 following a 3D seismic survey.

It has been reported that huge hydrocarbon reserves have been detected in the Kerala-Konkan deep water basin in western offshore India.

Norsk Hydro has discovered oil southwest of the Heimdal field in the North Sea, according to the Norwegian Petroleum Directorate. Exploration well 25/7-5 tested at 960 cm/d of oil and 81,000 cm/d of gas.

Amoco and Bridas Corporation of Argentina have formed a 60:40 strategic alliance to explore for and develop gas projects in the southern region of South America.

Arco's Bladon field produced first oil on 9 September, 10 months after the field was discovered in November 1996. The single development well, located in block 16/21d, 225 km northeast of Aberdeen, is tied back to Golar Nor's Petrojarl 1 floating production storage and offtake vessel which is developing the Blenheim oil field 5.3 km to the south.

Amerada Hess has signed a three-year rig contract with Norwegian-based Dolphin Drilling for the Borgny Dolphin to drill the first well in the Falklands in May 1998.

It has been reported that Unocal of the US and the Bangladesh Government have signed a preliminary agreement to develop the Shahbazpour gas field in the south of the country.

Poland has discovered what is reported to be its largest ever deposit of hydrocarbons near Gorzow in the west of the country. The field is estimated to hold some 10mn tonnes of oil and over 10bn cm of natural gas.

It has been reported that Bohai Oil of China has discovered its third largest oilfield in the Bohai Sea. The Nanbao 35-2 oilfield has estimated reserves of 113mn tonnes and crude output is projected at 2mn tonnes a year.

NEW_{Stream}

Janice field development gets the go-ahead

The UK Government has approved the development plan for the Janice field in block 30/17a in the North Sea. The field will be developed using horizontal wells for oil production and water injection tied back from subsea wellheads to a floating production unit (FPU).

The FPU is an existing semisubmersible accommodation unit which has been purchased by the Janice co-venturers from Smedvig and will be converted for oil and gas production under a fabrication contract with Aker McNulty at its Tyneside yard.

Oil will be exported from the FPU via a new pipeline to the Norpipe system for

redelivery at Teesside. Gas will be exported via a new pipeline to the adjacent Judy platform.

The field is estimated to contain some 70mn barrels of recoverable oil and first production is scheduled for 3Q1998. Production is expected to peak at 55,000 b/d.

Janice field equity interests are: Kerr-McGee Oil (50.9%, operator); Phillips Petroleum (24.4%), Agip (18.2%) and Svenska Petroleum Exploration (6.5%).

According to Kerr-McGee, the Janice installation will form a hub for future developments in the area. Extra capacity will be designed into the facility to accommodate any such developments.

Maersk Curlew at Amec's yard with BP's ETAP central processing module behind

In mid-September the newly converted Maersk Curlew FPSO left Amec's Newcastle yard for the Curlew field in block 29/7, 220 km east of Aberdeen. Final hook-up work is now underway on the £300mn project and first production is expected this month. Recoverable reserves are assessed at 71mn barrels of oil/condensate and 244bn cf of gas with a peak production of 45,000 b/d of liguids and 100mn cf/d of gas. The gas will be exported via the Fulmar pipeline to St Fergus while the liquids will be exported by shuttle tanker. The Maersk Curlew has a storage capacity of 560,000 barrels or 12 day's production at peak output.

Between 1990 and 1994 four hydrocarbon accumulations were identified in Block 29/7. Initially the 'B' and 'D' reservoirs will be developed. Discovered in 1990, the 'B' reservoir has reserves of 16mn boe and is being developed with a single horizontal well while the larger 'D' reservoir with reserves of 111mn boe (range 78 to 135mn boe) was only discovered in March 1994. According to Austin Hand, Shell's Project Manager for the field, the other two accumulations could be linked into the production system if this becomes economically attractive. The 'A' reservoir is assessed as having 15mn barrels of oil reserves but is at some distance from the other accumulations. The 'C' reservoir which is adjacent to the 'D' reservoir offers only low recoveries from its chalk horizon.

A key innovation in the project is that Shell is leasing the converted FPSO from Maersk under an initial four-year contract. Currently estimated field life is seven to eight years but Shell has the option to lease the *Maersk Curlew* for up to 20 years including redeployment to other fields.

The Maersk Curlew was converted from the 100,000-tonne tanker Maersk Dorset by the MAS Alliance of Amec Process and Energy, SBM of Monaco and Maersk Contractors.

In Brief

Statoil has announced that a new independent shipping and offshore company - Navion - in which it holds an 80% interest, with Norwegian shipowner Rasmussens Rederi holding the remaining 20%, is to be established on 1 October 1997. Navion's 50-strong fleet of directly owned and chartered vessels will provide a range of services for maritime offshore operations and transport of crude oil, gas and refined products although its main focus will be operating shuttle tankers for offshore loading of oil.

British Gas Tunisia Ltd (BGTL) has sold its 50% shareholding in Tunisian British Services as well as its 34.3% interest in the Kerkennah West permit and 49% stake in four associated concessions including the offshore Cercina field and four smaller onshore fields to Preussag Energie of Germany. The sale, which is subject to Tunisian Government approval, does not affect BGTL's 100% stake in the offshore Miskar gas field which supplies up to 80% of Tunisia's gas.

Shirvanoil, an Azerbaijan-British joint venture has been established to increase production from the Severnyy, Tsentralnyy and Yuzhnyy Kurovdag onshore oilfields southwest of Baku. It is reported that the company plans to recommission some 100 currently idle wells and to boost daily production from 600 to 1,000 tonnes.

Intrepid Energy, a new UK independent oil company, has entered the UK North Sea asset market with the acquisition of a 13% stake in the Ross field in block 13/29a from BG Exploration and Production.

It has been reported that Triton Energy of the US and Malaysian state owned oil company Petronas have discovered a seventh natural gas field in the Malaysian-Thailand Joint Development Area (JDA). The Samudra 1 well in Block A-18 flowed at a combined rate of 49mn cf/d of gas and 858 b/d of condensate.

Amoco (UK) Exploration and its North Sea project co-venturers have announced a major drilling programme designed to increase reserves and enhance production from their central and northern North Sea oil and gas fields. The programme, which will run for a three- to four-year period, will utilize two newbuild drilling rigs.

Innovative FPSO on fast track to Curlew field

NEV/Downstream In Brief

Wingas natural gas grid expansion



Wingas of Kassel, Germany, is soon to complete an extension to the Yamal-Europe Pipeline System. The new Jagal (Yamal Gas Link) pipeline will run for some 330 km linking Mallnow in Brandenburg to Rückersdorf in Thuringia where it will join up with the Stegal line, also part of the Wingas natural gas grid (see map). Work is expected to complete by mid-1999. Together with the expansion of the two compressor stations at Mallnow and Rückersdorf, the project will cost in excess of Dm1bn.

The Jagal extension will link the vast Russian gas reserves to the growing markets in western Europe. According to Wingas, recent forecasts indicate that by the year 2010 western Europe will require an additional 150bn cm of gas per year. One-third of this volume will be supplied by the Yamal-Europe Pipeline System which will extend over more than 4,000 km from the Siberian Yamal peninsula to Frankfurt/Oder once the pipeline network is completed.

Construction of the Jagal line will begin with the 99-km section between Mallnow near Frankfurt/Oder and Baruth, to the south of Berlin. The pipeline will transport up to 28bn cm of natural gas per year at a maximum operating pressure of 100 bar.

Wingas also plans to build a new pipeline under the River Rhine to connect Monheim and Cologne/Worringen. The 390-metre pipeline will link up two parts of the Wedal natural gas pipeline extending to Bielefield on the right bank of the Rhine and to Aachen on the left.

The Wedal line is the first gas pipeline to provide a supply alternative to municipalities, major industrial consumers and regional utilities in the North-Rhine-Westphalia, states Wingas. The first section of the Wedal line linking Bielefeld to Soest and supplying the towns of Lippstadt and Soest was commissioned at the beginning of 1997. The second section linking Soest to Aachen is due to be completed by October 1998.

Wingas is a 65:35 joint venture between Wintershall and Gazprom of Russia. The company entered the German market place in 1993. It sold approximately 61bn kWh worth of natural gas in 1996 while the long-term sales volume contracted at this time amounted to over 12% of the German market place.

It has been reported that Qatar plans to spend up to \$15bn developing its gas and industrial infrastructure over the next three years. This will be in addition to the \$11.5bn already spent/committed on LNG projects and the expansion of chemical plants and refineries in the country.

Kuwait and Tunisia have signed an agreement for the construction of a new 125-km crude oil pipeline linking Kuwait's Sidi Kilani oilfield in southern Tunisia to the Sukhayrah area and on to either the country's main oil refining area or nearby sea ports.

Iraq started pumping crude oil through pipelines from the Ceyhan port on the Mediterranean through to the Karakala refinery, close to the Turkish capital of Ankara on 27 August. The country has signed a contract to sell the Turkish Tobrash Company some 1.8 million tonnes of oil which will continue to be dispatched until 4 December.

It has been reported that Romania plans to merge its oil exploration company Petrom, two state-owned refineries (Petrobrazi and Arpechim) and part of the national oil distribution company Peco in order to create a larger company - Societatea Nationala de Petrol - part of which will be sold to investors sometime next year.

The Armenian Government and Gazprom of Russia have set up a joint gas company, ArmRosgazprom, that will distribute Russian gas to new markets in Turkey and Armenia. Each of the companies will hold a 45% stake in the new company, the remaining 10% to be held by Itera, an international consortium with US participation.

Thames Petroleum Products Group has sold its Thames Rico Service Stations subsidiary to Petrol Express, a new company formed by Rikki Hunt, former Managing Director of Burmah Petroleum Fuels. Founded in 1975, Thames Rico owns and operates 25 service stations in the UK, most under the Esso banner. Thames Petroleum Products has also sold its Thames Petroleum (Scotland) subsidiary to Thames Gold Service Stations, a new company formed by Cameron Gold, previously Thames' General Manager in Scotland. Thames Petroleum (Scotland) sells over 50mn litres of fuel through some 90 dealer and five company-owned sites, under the Thames brand, and is the largest independent in Scotland.

NEV Swnstream

Shell set to acquire Gulf's UK downstream assets

Shell UK is reported to be close to finalizing a deal under which it will acquire Gulf's 479-strong network of service stations and lubricants business in the UK. The negotiations between Shell and Chevron, which owns Gulf, are expected to complete in the fourth quarter of 1997.

It is thought that Gulf's Cheltenham headquarters and 115,000 b/d Waterston, Milford Haven, refinery will be closed if the deal goes ahead. Shell will have little interest in the refinery as it already has two refineries in Stanlow and Shellhaven in the UK, a sector which, like the rest of western Europe, remains burdened by overcapacity. Some of Gulf's service stations may also be closed.

Chevron has been looking to sell its downstream activities so that it can concentrate on oil and gas production for a number of months. Merger negotiations with Murphy Oil Corporation (Murco) and Elf Oil UK fell through earlier this year after Murco pulled out stating that any merger between the three companies 'would not significantly improve Murphy's existing,

Snapshot of August fuel prices in the UK

	Pence per litre
Diesel	
Lowest: Glasgow	61.04
Highest: Aberystwyth	66.23
National average	63.77
Unleaded petrol	
Lowest: Edinburgh	61.01
Highest: Aberystwyth	66.38
National Average	63.48
Four-star petrol	
Lowest: Swansea	66.79
Highest: Aberystwyth	72.05
National Average	68.70

Source: PHH Allstar Fuel Report

British Gas to cut UK domestic gas prices

British Gas Trading has announced substantial cuts in prices to domestic customers throughout the UK. Reductions will take effect from 12 January 1998.

Some 16mn credit customers, including 10mn who opt to pay their bill within 10 days, will see savings of around 9% on an average bill, states the company. A further six million who pay cost-effective and efficiency downstream system' (see *Petroleum Review*, April 1997). Elf subsequently called off its merger dealings with Gulf stating that the two companies had found it impossible to finalize a mutually satisfactory agreement (see *Petroleum Review*, July 1997).

If the deal goes ahead, Shell will account for almost 20% of branded market share in the UK petrol retail market, according to consultants Wood MacKenzie, and will move ahead of Esso to become the UK's largest marketer of oil products. Exxon, which trades as Esso UK, will retain pole position in the league of petrol retailing but the recently merged BP/Mobil operation will drop to third place currently occupied by Shell. The top three UK marketers now have a combined market share of over 50%, reports Wood MacKenzie.

The Gulf acquisition will help Shell recover lost volume and market share and will particularly strengthen Shell's presence in Scotland and South Wales, according to analysts at Wood Mackenzie.

Save on solid footing

Independent UK petrol retailer Save has reported that fuel sales began to pick up over the past six months of 1997 as the impact of Esso's Pricewatch campaign, which has progressively forced down UK petrol pump prices, looks to be on the wane. Interim figures for the first half of 1997 showed a return to growth in volume during May to August although turnover for the first six months of 1997 fell by 16% to £203.7mn compared to the same period in 1996. Profit before tax of £4mn was 6% ahead of last year.

James Frost, Save Chairman, commented that the solid base volume of the group's company-owned sites, currently some 2% of UK market share, will grow back to between 3 and 4% once Pricewatch finishes. He also said that the company is in a 'strong position for the future' because, unlike some other oil companies, it is unencumbered by an under-utilized refinery.

by monthly direct debit on the company's DirectPay scheme already save 6% and will see a further drop in prices of more than 9%.

Prices for one million prepayment customers have been frozen however, pending the outcome of an industry review headed by the UK gas industry watchdog Ofgas.

In Brief

Mobil has announced that it plans to invest some \$3bn in Venezuelan downstream and upstream projects over the next five years.

UK gas suppliers Amerada Hess Gas and South Western Electricity (SWEB) have formed an alliance that took effect on 1 October 1997. The move provides the SWEB Gas venture with access to long-term gas supplies from Amerada's North Sea fields. Under the agreement, SWEB is responsible for marketing of gas and is to sell its share capital of Western Gas (which trades as SWEB Gas) to Amerada Hess.

Transco, the pipeline, storage and distribution arm of BG plc has announced that it will cut its natural gas transport charges for gas shippers (not end users) by an average of 13% for the year from 1 October 1997.

Gazprom is to supply some 8bn cm/y of gas to Turkey by the year 2000 and 16bn cm/y starting in 2003 following the signing of a framework agreement for the pipeline transport of Russian natural gas from the port of Tuapse in Russia across the Black Sea to the Turkish port of Samsun.

The Indian Government has increased the price of domestically sold petrol and diesel in a bid to help cover part of a \$5bn deficit caused by the selling of petroleum products at below international market prices. Petrol prices are reported to have risen by 5% while diesel prices have increased by 26%.

Slovenia increased its petrol prices by some 4% in September due to rising crude oil prices together with the appreciation in the dollar.

UK gas company BG plc's joint venture First Gas Power Corporation has concluded an international financing arrangement of \$680mn for a gas fired power plant to be built on Luzon Island in the Philippines.

Russia is reported to have announced plans to sell off some 96% of stateowned company Rosneft in two stages in a bid to raise more than \$1bn. The timing and terms of the sale have not been disclosed.

Russia and Chechnya have signed an oil pipeline agreement which will allow Caspian crude to be transported to the Russian Black Sea port of Novorossiysk via Chechen territory by the end of 1997.

NE bownstream

Unmanned petrol stations unveiled



Kuwait Petroleum (Q8) is planning an investment programme for a number of unmanned petrol stations in the UK enabling customers to buy petrol alongside their groceries at the supermarket checkout. A number of high-street stores are to be involved in the programme. Budgens was the first to test the 'automat' concept at pilot sites in Cambridge and Mountsorrel while the programme was officially launched last week at a new Waitrose supermarket in Newark-on-Trent.

The automat enables the supermarket to provide its customers with the extra service of a petrol station but in a quarter of the space, according to Q8. Unlike traditional petrol stations, the Newark site has no kiosk. Instead shoppers pay at the pump with their choice of a credit, debit or fleet card or using Waitrose's new Quick Fuel card. There is no need to leave the car

Mobil markets CNG

Mobil has entered into the UK domestic gas market with the formation of Mobil CNG Limited. Based in London, the company will offer compressed natural gas (CNG) as a fuel for commercial vehicles, bus fleets and local authorities.

Mobil marked the launch of the new venture with the announcement of a first contract. The company will supply CNG to the supermarket chain Safeway for a trial of 10 CNG-fuelled delivery vehicles at the company's Welwyn Garden City depot in Hertfordshire.

A CNG refuelling point will be installed at the depot. Gas for compression will be drawn from the national gas pipeline system. Safeway staff will simply refuel the vehicle with CNG from an on-site dispenser resembling an ordinary diesel pump. and go to a kiosk to pay – this not only saves the customer time but also gives parents the reassurance of being able to stay with their children throughout the transaction, says Waitrose.

The Quick Fuel card allows the customer to buy petrol and shopping in a single transaction. If they opt to purchase their shopping by cash, they can buy a Quick Fuel card in any £5 denomination which they can then use in the automat to pay for their petrol. According to Q8, research has shown that over 50% of the UK population still buy their groceries by cash.

Q8 is now seeking new sites in the UK and aims to develop at least five automats by July 1998. The company also plans to introduce the new technology to Europe, including Italy where it is market leader.

News in Brief Service

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In Brief

Sonatrach of Algeria is to invest some \$19.3bn on expanding its reserves and developing downstream activities over the next five years. It has been reported that the national oil and gas company also plans to increase its international activities, focusing in particular on Europe's gas sector, both upstream and downstream.

It has been reported that UK gas industry watchdog Ofgas is to force price cuts of up to 25% in the charges levied by Transco, the former British Gas pipeline company. Industry analysts speculate that the move could cost Transco up to £500mn over the next five years.

Repsol-controlled oil company Astra has accepted a \$45.54mn offer for its shipping subsidiary Antares Naviera from the Panamanian company Ultragas International. The divestment of Astra's shipping assets will allow the company to focus on its core areas of exploration and production, refining and marketing, LPG, natural gas and electricity.

Shell Prospecting and Development Peru, operator of the Camisea Project in Peru, is to award the Bechtel/COSAPI/Odebrecht (BCO) Consortium the contract for the development of the infrastructure which will enable Camisea gas and liquids to be delivered to Lima and other markets. Engineering studies for a gas plant, pipelines to the coast, and coastal processing and export facilities are to start immediately.

BP Solar Australia has secured the contract to supply the first 500 solar power systems for the athletes' village in the recently established Sydney suburb of Newington, adjacent to the Olympic site at Homebush. The village includes 665 permanent houses all of which will have a 1kW peak renewable solar energy system installed. According to Ken Brown, General Manager of BP Solar Australia, the village will be the 'world's largest solar suburb'.

Lithuania is reported to have invited some 20 foreign companies to make bids for a consultancy contract covering the privatization of Mazeikiai Oil which is said to be the largest oil refining company in the Baltics.

The Indian Government has approved BG plc's proposal for an LNG import terminal at Pipapav port in the western state of Gujarat. Total investment in the project over the next five years is estimated at \$400mn.

Continuous Density Measurement

This revised standard describes the latest technologies for the continuous determination of the density of liquids and gases including stable crude oils, enriched crude oils, condensates, natural gases and other liquid and gaseous products commonly encountered in the petroleum industry.



The first edition of this part of the Petroleum Measurement Manual was published in 1983. Since then there have been significant improvements in the technologies and practices associated with continuous density measurement. At the same time the number and range of applications have expanded, especially in the measurement of petroleum streams at offshore installations. This second edition offers comprehensive guidance on the capabilities, accuracy, installation and calibration of the types of continuous density measuring equipment that are now in use in the petroleum industry. It reflects experience gained by users in the application of such equipment.

This standard covers the continuous determination of the density of liquids and gases including stable crude oils, enriched crude oils, condensates, natural gases and other liquid and gaseous products commonly encountered in the petroleum industry. It describes equipment for continuous density measurement and covers the installation and proving of this equipment. Methods of determining density on individual samples are given in Part VII, Section 1 of the Manual: General Guidance on Test Methods and in IP Standard Methods for Analysis and Testing of Petroleum and Related Products and BS 2000 Parts (methods IP 160, IP 189, IP 190, IP 235, IP 249 and IP 365).

Accuracy in the measurement of density is essential for some bulk measurements (ie mass computation) and also for many qualitative purposes. For these applications, this standard describes installations capable of giving an uncertainty of up to 0.15% for liquids and up to 0.2% for gases and condensates.

Installations suitable for high accuracy measurement for the purposes of sales, custody transfer, taxation or the allocation of production in multi-user pipeline operations are described. Such systems will be referred to in this standard as fiscal metering systems, implying a standard of accuracy that is the highest reasonably attainable in practice, taking account of the balance between cost and accuracy. Equipment and installations suitable for situations where less comprehensive systems give satisfactory process data are also covered. The problems of multiphase mixtures are pointed out and precautions are described for minimizing the problems and reducing the tendency to form additional phases.

In this standard the basic SI unit of density is employed, this being the kilogram per cubic metre (kg/m³). This has now become the most widely used way of expressing density. Density may also be expressed in the gram per millilitre (g/ml) which is numerically equal to kilogram per litre (kg/l) and tonne per cubic metre (t/m³).

Available for sale from the IP Library, at a cost of £40.00 inc. postage in UK and Europe (outside Europe add £5.00).

For more information on how to order this publication please contact The Library, Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR, UK. Tel: +44 (0)171 467 7100. Fax: +44 (0)171 255 1472. e-mail: Lis@petroleum.co.uk

Coalbed methane comes into its own

Coalbed methane is becoming a realistic source of natural gas for some countries with substantial coal deposits. Companies such as Arco, Texaco, Conoco, Phillips, Amoco, Anadarko and EuroGas are already involved. In the US, coalbed methane production has increased sharply in recent years, principally from the San Juan Basin in Colorado and New Mexico, and the Black Warrior Basin in Alabama and Mississippi. In 1996 it accounted for more than 950bn cf, some 5% of all **US natural gas production** in that year. There is increasing interest and some production, in Poland, Australia, China, India, Germany, Zimbabwe, UK, Canada and Venezuela reports Judith Gurney.

Technological advances in methods of exploration and production, improved identification and understanding of reservoirs, and favourable economics, are encouraging increased capital investment in extraction projects.

Coalbed methane is created naturally as a by-product of bacterial action as peat changes to coal when subjected to heat and pressure. Much of the gas formed during the initial coalification process was undoubtedly lost to the atmosphere but a significant portion has remained as adsorbed gas on the internal surfaces of the micropores within the coal and in the joints and fractures of coal seams, held there by pressure. Coalbed gas is generally 94% to 96% methane with a heating value of approximately 1,000 btu/cf, but it may also contain traces of ethane, propane, butane, and pentane, as well as nitrogen and carbon dioxide. The fact that it does not contain sulfur adds to its value, and often produced coalbed gas is sufficiently pure to be pumped directly into existing gas pipelines serving the industrial areas which grew up near to coal deposits.

The amount of adsorbed methane in a coal deposit is a function of the coal's adsorptive capacity, its thermal maturity in the coalification process and its depth. The standard method for ascertaining the extent of its presence involves drilling a number of wells to extract sizable cores of coal which can then be placed in a canister where their methane can be desorbed and measured. Extrapolation of these measurements provides an estimate of the gas content of a deposit. A prospect generally is considered worth pursuing if the reserve estimate is around 300 cf of methane per tonne of coal.

Conventional production

Since coal is relatively impermeable, methane must be recovered from fractures within a deposit. Production is usually easier from coal seams which are naturally highly fractured,

depending on the positioning of fractures and how well they are developed. Historically, the standard practice to complete a coalbed methane well was to drill, run casing to the total depth, cement the casing, perforate the target zone and then hydraulically stimulate the formation and increase fracturing by injecting water at very high pressure. The fractures created and enlarged by this process were then filled with a slurry of water and sand, or water and gel, to prop them open, and hydrostatic pressure was slowly reduced to release absorbed methane. The disposal of removed water, which often contains dissolved solids and pollutants, can be a problem. In the US, removed water is reinjected wherever possible in wells sunk for this purpose; where this is not feasible, companies must obtain a permit for other disposal methods. At most sites a company needs an approved environmental impact statement covering its handling of water disposal before beginning to drill.

Coalbed methane production rates from conventional hydraulic stimulation, unlike those of conventional gas reserves, start slowly and then gradually increase over time. Production life can sometimes be increased by new enhanced recovery techniques for desorbing methane from coal, such as the injection of carbon dioxide. Another new technology involves nitrogen injection to release methane by sorption displacement. Amoco, which holds a patent for one method of nitrogen injection, believes that up to 90% of the methane in place may be recovered this way from relatively homogeneous coal reservoirs, a significantly higher rate than that generally obtained with conventional reservoir depressurization. To date, nitrogen and CO2 enhanced recovery technologies, however, only work well in coal deposits with simple fracturing.

Hydraulic stimulation can be harmful in weak, thick coal deposits with multiple natural fractures, such as those found in some of the US San Juan Basin. In these instances, a hydraulically enlarged, sand-filled fracture acts like a wedge, closing the adjacent parallel fractures and thereby diminishing the permeability of the coalbed in nearby areas. In other cases, some of the fluids used in the hydraulic stimulation treatment may react with, or otherwise detrimentally alter, the coal formation, leading to more formation damage.

Open-hole cavitation

An alternative, recently developed technology for coalbed methane production in overpressured, highly permeable conditions such as the San Juan Basin is open-hole dynamic cavitation, a complex but often highly effective well completion technology. Critical reservoir conditions for successful cavitation are still only partially understood, but appear to be low stress settings with good permeability, adequate seam thickness and fully gas-charged coals. The process involves drilling a cased well to a point just above the main coal producing section and then drilling a well into the section itself in which water air mixtures are repeatedly injected at high rates and pressures to bring about controlled blow outs. The borehole enlarges to form a cavity and stress is lowered around it leading nearby fractures to open and become more permeable. It also becomes linked to more of the structure's natural fracture systems. The flow rates of both water and gas increase dramatically as a result of increases in permeability during the cavity completion process. The change in these rates tell a skilled operator how the cavitation process is proceeding and when the cavity has grown so large that it is in danger of collapse.

US tax credits

The US Government Energy Information Administration (EIA) listed US proved coalbed methane reserves in 1995 as 10tn cf, about 6% of total US proved Some industry reserves. gas estimates of total resources run as high 400tn cf, with 90tn cf recoverable under current technology. The passage of the Crude Oil Windfall Profit Act of 1980, which provided tax credits for coalbed methane wells drilled between 1980 and 1992 on new property, stimulated new interest in the industry. The legislation aimed at encouraging production at a time when oil prices were too low to allow unconventional fuels, such as coalbed methane, to compete successfully in the marketplace. The US has industry coalbed methane continued to expand following the expiration of these tax credits. There are currently some 6,000 active wells whose productivity varies widely according to coal thickness, gas content, permeability and other key reservoir parameters, as well as production methods.

Well over half of the proved and probable US reserves are in the western San Juan Basin, in thick individual or multiple-seam coal deposits, some as deep as 10,000 feet. San Juan accounts for more than 80% of current US production, with some 2,500 producing wells; many of the newer wells are openhole, dynamic cavity completions. The other main producing area is the eastern Warrior Basin. Both of these basins face problems in expanding production. High costs of water treatment and disposal are hampering development of San the expense of and Juan. developing the thin coal seams of Warrior reduce the potential in this basin.

Shifting focus

There are several promising new areas for US coalbed methane production. The northern and central Appalachian coal fields in West Virginia, Virginia, Pennsylvania, Ohio and Maryland are one possibility. There has been smallscale output in this area for many years with one deposit in West Virginia in production since 1932. In some of the Appalachian fields, although coal seams are often as thin as 8 to 12 feet, the gas content is high at 400 to 600 cf/tonne and depths are usually less than 4,000 feet, and often only 500 feet, which lowers the cost of wells. Much of the current development here is taking place in conjunction with coal mining - Consolidated Coal is a major producer - and extraction from conventional hydraulically stimulated wells predominates. Land ownership has been a problem for the development of some fields here as the existence of numerous small leaseholders made it difficult to acquire large lease holdings. The problem was especially bothersome in Virginia until legislation in 1991 clarified ownership rights.

A second new area of promise is the Uinta Basin in eastern Utah where several companies, including Texaco and Anadarko, are producing from wells in fields whose names suggest a history of hard times: Drunkards Wash and Buzzard Bench. Coal seams here are generally thick, averaging 30 feet, and gas contents range around 400 cf/tonne. Structures are overpressured and free gas is commonly present within coal cleats and fractures. Production is by hydraulic stimulation using sand and gel and a recent major discovery appears to have found conditions that match those of the prolific San Juan Basin. A third new area is the Raton Basin southeast of the San Juan Basin in southeast Colorado and northeast New Mexico, where a lack of pipeline infrastructure precluded commercial development until very recently. Amoco and Evergreen Resources are active in this basin, the former in Cottontail Pass and the latter at Purgatorie River. There are also small reserves under exploration at Powder River in northeast Wyoming.

The major international active coalbed methane plays are in Australia, Poland, and China. A recent Australian Gas Association report suggests that coalbed methane, called there coal seam methane, can meet 2 to 3% of the country's natural gas demand in the short to medium term. Total reserve estimates run from 186bn cf to 465bn cf. Most reserves are located near population centres in New South Wales and Queensland and the companies interested in developing these include Conoco and Amoco. No large-scale projects have been undertaken to date, but there has been some production from collieries meeting small niche markets. Low permeabilities and relatively high stresses in Australian coal seams present technical problems which may require production methods different from conventional hydraulic stimulation and open-hole cavitation.

There is a lot of activity in Poland, especially in the southwestern Upper Silesian Coal basin, and a US government agency study has estimated Poland's coalbed methane reserves as more than 45.9tn cf. Texaco and another US company, EuroGas, with its subsidiary, Globe Gas of the Netherlands, are involved in projects in Poland. In China, Phillips recently entered in a joint venture with CBM Energy Associates and five Chinese companies for a coalbed methane project in Shanxi Province, 418 km southwest of Beijing. There are large amounts of coalbed methane in and around German fields which companies are currently examining, but these present extraction problems due to their depth and the characteristics of the coal seams, and due to high German labour costs, may not be economic to produce. There is interest in India and in the UK where Evergreen Resources has obtained exploration and development licenses.

US Coalbed Methane Production (bn cf/y)			
1985	10		
1986	17		
1987	24		
1988	40		
1989	91		
1990	200		
1991	354		
1992	562		
1993	748		
1994	858		
1995	973		
1996	956		
Source: US Energy Infor	mation Administration		

BP action on global warming alters political atmosphere

British Petroleum appears to have acknowledged that the carbon dioxide emitted during the burning of fossil fuels, oils, gas and coal, may have a deleterious impact on global weather patterns and climatic conditions. This action has prompted carefully worded public responses by US-based oil companies and some nervous harrumphing in private by some of them, writes Peter Adam.

f fossil fuels are, or are widely perceived as, contributing to possible climatic catastrophe, governments may have to radically alter the way in which the world generates energy. All involved in the present energy order – as well as those who strongly oppose it – are starting to sense, in some cases belatedly, how high the stakes are and how vulnerable many companies and entire industries could become.

Speaking out

On 15 May 1997, in the course of a talk at Stanford University in Palo Alto, California, BP Chief Executive John Browne staked out some progressive high ground. 'The time to consider the policy dimensions of climate change is not when the link between greenhouse gases and climate change is conclusively proven but when the possibility cannot be discounted and is taken seriously by the society of which we are a part,' he said. 'We in BP have reached that point.'

For the petroleum sector, and many associated industries, this may represent a point of no return.

Until Browne's talk, fossil fuel company lobbyists and industry spokespeople had been able to deny the basis of serious and widespread concern because of a lack of clear evidence for a possible link between fossil fuels and global warming. Industry groups had also been united in opposition to binding agreements that would obligate countries to control emissions of so-called greenhouse gases.

Business interests had hoped to be able to continue to speak with one voice on the issue, particularly during negotiations of the final phase of an international climate treaty to take place in December 1997 in Kyoto, Japan, under UN auspices.

Instead, they will now present a divided front, largely as a result of the BP initiative which has prompted some serious reassessment and repositioning. Many concerned business entities now seem willing, officially, to consider at least following BP and to consider the views of scientists who take the possibility of emission-caused climatic change seriously.

Evidence of this is seen in an advertisement that appeared in major US newspapers on 10 June 1997, paid for by the US petroleum industrysupported Natural Resources Defense Council and signed by Amoco, Arco, Chevron, Exxon, Mobil and Shell. The companies affirmed a commitment to both a healthy environment and a healthy economy.

'Later this year,' the advert pointed out, 'the Clinton/Gore administration must decide whether to sign an international climate treaty designed to reduce the potential dangers of global warming. It may be the most important economic decision of this century, and the next as well.'

The advert went on to state: 'A balanced approach is possible with careful study, input from a wide variety of sources, and extensive public debate. We strongly urge the Clinton/Gore administration not to rush to policy commitments until the environmental benefits and economic consequences of the treaty proposals have been thoroughly analysed. Americans should have the opportunity to voice their opinion in this important debate.' (It is interesting to note that major US gas companies, such as Enron, did not sign the advert and seem to be taking a stance somewhat closer to BP's on the issue.)

Adopting a tone similar to the National Resources Defense Council, Mobil in one of its own advertorials called for more research and a reasoned discussion.

However, the US petroleum industry's unofficial response to BP's move is less measured and equivocal than the public pronouncements would suggest. Dismissiveness tinged with feelings of betrayal are evidenced by the words of one employee of a major US-based petroleum industry association: 'BP's just toeing the European line on this', the implication being that the company's position is little more than a public relations sop to Eurovironmental crazies and neo-Luddites out to destroy industrial civilization.

In an advert that Greenpeace placed in the New York Times, following the oil companies' notice, the names of oil company CEOs ran beneath the corporate logos of Texaco, Chevron, Mobil, Arco, Shell, Exxon and BP. The headline ran: 'These guys can actually change the weather.' Instead of inviting a discussion of the environmental/ economic tradeoffs that continued reliance on fossil fuels for energy implies, Greenpeace stated that: 'Global warming is now an accepted scientific fact. Unchecked, it will mean more severe storms, more floods, more crop failures ... The men who run the major oil companies must know the last thing we need is more oil.

'These companies need to be pressured to do what is prudent and necessary for life on this planet,' the advert continued.

'We at Greenpeace are leading the fight to stop the oil companies from further exploration for oil we do not need and must not burn. Please join us.'

To date, despite the fact that they may well want to do so, US oil companies seem reluctant to press the hard case against a climate treaty that would bind countries to control greenhouse gas emissions. It probably would be foolish of them to do so. Chrysler Chairman R J Eaton drew much derision for a piece he wrote for major newspapers in which he not only denied that global warming was a problem, but that doing anything about it would be too expensive.

The petroleum industry, which is not widely popular in the US, cannot afford to stonewall this issue and seems ideally placed to lead the way to a cleaner, more environmentally benign energy future. The major US oil companies are also major natural gas companies and encouraging gas use, in tandem with overall energy efficiencies, could be the most equitable and least disruptive solution to the environmental challenge of continuing to burn fossil fuels to meet growing demand for energy.

BP's statement accepting the reality of possible climate change prompted by hydrocarbons cites Karl Popper, whose thought was a major influence on former UK Prime Minister Margaret Thatcher, and the conservative US thinker Francis Fukuyama who coined the awkward and perhaps inappropriate phrase 'The End of History'. Fukuyama envisions a social order that goes beyond the contractual; an order driven by a sense of common human interests, in which societies thrive. 'Nowhere is the need for that [referring to Fukuyama's construct] sort of social order at the global level more important than this [the environment] arena,' Browne asserted.

In framing the terms of the debates to come in such a positive way, he has done his company and the industry a great service.

A recent study entitled Energy Demand and CO_2 Emissions issued by the Petroleum Industry Research Foundation (PIRINC) points out that automotive engines were the main source of growing hydrocarbon-related CO_2 emissions and that the most effective means of arresting their growth would be to improve automotive engine fuel efficiency. The report goes on to cite Energy Information Administration projections that a 33% improvement is technically feasible by the year 2015.

Energy, automotive and related industries, by trying to finesse the challenge posed by the possible link between hydrocarbons and climatic change may be able to forestall or ameliorate the impact that coming to terms, will necessitate. But this course of action would allow Greenpeace-like extremists to frame the upcoming and totally necessary, messy, public, international debate on this issue.

Innovative Solutions for the Future



European Conference and Exhibition at Petrol Filling Stations

Location	The Metropole Hotel,	CONFERENCE SPEAKERS			
Exhibition	NEC Birmingham	Declan Ryan	Engineering Manager of Statoil Ireland -		
Pre-Conference		Maurice Acton	Chairman of MTA Design - "Designing for Change in Petroleum Retailing".		
dinner Conference	10th November evening 11th November	Arne Myhreman	"Petrol Dispensing for the New Millennium".		
Free Workshops	10th November:	Michael Baach	President of the Corpro Company - "An economic Alternative to		
 Vapour Recovery at the Petrol Filling Station Law and Design Vapour Recovery Stage 2 at the Petrol Dispenser 		Dr Robert Mitchell	 SIR International & Tuthill Europe - (Joint Paper) "Secure Leak Detection for Single Wa Tanks and Lines" 		
		Alan Chandler			

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Unlocking the knowledge in the minds of the industry

Technology and innovation are clearly the beacons pointing the way ahead for major oil companies, not only to stay competitive but to enhance their prospects for growth in the coming years in both the mature areas of the world and in the energy hungry markets of the developing countries. Indeed, it could be said that those who do not follow these paths could fall back along the wayside, writes Neil Potter following a meeting with Andrew Mackenzie, recently appointed Director of Technology at BP.

ccording to Mackenzie, BP is fully aware of the importance of innovation and he sees his objective as Director of Technology as: 'to help increase the integration of technology across the Group while preserving and strengthening the partnership between the business line and technology deliverers.

'My view is that the pace of innovation is increasing,' he says. 'We at BP have to be a leading edge company. We have to aspire to a higher level of leadership than we have in the past.'

He believes that BP should aim to acquire distinctive ownership of key leading edge technologies. One of the advantages of this approach is in the downstream sector. This has been proven in developing areas, particularly in the Far East. 'It enables the company to go to these areas and show what we can offer in the way of cost-effective technology,' he says. 'This is the strength we have and we would not have achieved the success that we have there without that technology. We can prove that not only do we have the technology but also that we can operate it.

BP's 'official' central spread on research and development (R&D) is put at \$200mn a year – of which \$100mn is on medium- and long-term projects. But the actual spend is much more than this – for many of the individual business assets absorb R&D costs into their own budgets.

This driving force of advancing technology runs through the whole gamut of operations – exploration and production, refining, chemicals and petrochemicals.

Breakthrough in gas conversion technologies

The economic conversion of methane has been an industry dream for more than 70 years. Several majors have developed technologies.

'Now,' says Mackenzie, 'BP has announced its plans and we believe our technology is the best.' BP has invested \$130mn since 1980 in investigating the technology.

The public news of the radical breakthrough in gas conversion technology came this summer at a conference in Alaska. 'We believe,' said Terry Lazenby, Chief Engineer at BP International, 'we have new technology that will cut the costs of gas-to-liquids conversion, and syngas production, substantially, and make the development of remote gas fields economically viable.

The key has been the development with our partners, Kvaerner Process Technology, of a steam-reformer for making synthesis gas. This will raise process thermal efficiency substantially above current available technology.

'In addition, we will be announcing a commercialization strategy for licensing the application of our syngas production technology, to make chemicals such as methanol and ammonia as well as hydrogen.'

BP believes extended well testing (EWT) is a key tool that helps it to optimize oil and gas developments. But these inevitably require the flaring of gas. 'We are reluctant to flare even well test gas,' says Lazenby. 'Small-scale compact gas conversion offers the opportunity to do away with EWT flaring.'

BP is now planning with Kvaerner to install a multi-million dollar small-scale demonstration unit. This would produce 300 b/d of liquids from 3mn cf/d of natural gas feed. Several sites are under consideration, including Alaska, the UK or elsewhere in the US.

The agreement with Kvaerner is one example of how BP sees its commercial relationships with development partners. Kvaerner's main interest in the compact reformer technology is the production of synthesis gas as an intermediate for chemical manufacture, BP's principal interest is syncrude production.

Kvaerner will act as licensing agent and will have sole responsibility for licensing and marketing the joint technology worldwide. Only the licensing of gas to transport fuels application will require prior consent from BP. The development of **BP's ETAP fields** Marnock, Mungo, **Machar and Monan** in conjunction with Shell/Esso's Heron, **Egret and Skua has** presented BP, as operator of the overall consortium, with a series of technical challenges and involved a series of industry firsts in developing these high-temperature/ high-pressure fields



Meanwhile BP will aim to exploit the gas-to-liquids application throughout the group wherever it proves to be the best option for getting gas to market.

BP is also part of a joint industry programme initiated by Kvaerner Engineering Environmental for developing a process for separating CO₂ from offshore gas turbine exhaust. This has progressed so far that a small-scale development and demonstration plant began in August at a Statoil laboratory at Karstø. This will operate until 2000, when it is planned to have a full-scale plant built.

Driving up recovery rates

Considerable effort is being put into the upstream sector. 'We fully expect the cost of penetrating the reservoir will become cheaper and cheaper, combined with an increased clarity of what is actually going on subsurface,' says Mackenzie.

'Developments in 4D seismic will lead to the ability to drill extensions or sidetracks to existing wells into reservoirs where the reserves would not have supported a separate well. Inevitably, too, this will help to drive the recovery rate up to 80% over the next 20 to 30 years.'

At the British Association meeting in September, Ian Jack, BP's Geophysical Adviser, said that time lapse seismic (reflection techniques) should allow improved reservoir recovery. He said that scientists backed by BP at the University of Edinburgh and at other institutions around the world are developing this new technique. It uses the same technique developed by astronomers to check for new stars by comparing photographs of the heavens taken over a period of time. By 'flicking' between old and recent photographs of the sky, new stars appear to twinkle.

By using a similar technique with sonar images of reservoirs taken over a period of time, geologists can pinpoint differences of intensity in fluids – allowing them to identify exactly where reserves remain and where trapped pockets of oil may be. The technique is being tested in around 30 projects in areas ranging from the North Sea to the Gulf of Mexico.

Other drives are towards managing fields better, cutting drilling costs, reducing the costs of building and operating pipelines, improving inspection and maintenance methods, and developing the use of new materials.

On the drilling front, extension of horizontal, multilateral and extended reach wells are a continuing target. BP's attempt to drill the world's longest extended reach well, M11, at Wytch Farm, ran into problems at around 7,000 metres and had to be sidetracked. But it remains confident that the 10-km target can be achieved. 'One expects some set-backs,' comments Mackenzie. 'If we are not failing from time to time, then we are not taking enough risks.'

Time to think

Although it is not a technological advance in itself, one major step

forward has been to adopt a policy of taking more time to study before the start of an operation, to consider previous operations which may have relevance, to learn about the potential of technology available, to discuss, to share resources. For the Wytch Farm well, the integrated team took 12 months preparing to drill. In the refining sector Mackenzie sees what he terms 'a raft of opportunities' - the way in which the company responds to environmental pressures, development of cleaner fuels, handling a more diverse crude input. There is even talk of separating some of the less valuable components at the wellhead. 'There are big challenges in a sector that is not generally that profitable."

One of the major challenges is to unlock the knowledge in people's heads and, as BP has put it, 'make it available to the people who need it, when they need it, in the way they need it.' Here BP has developed its Virtual Teamwork system which allows a person, say in Houston, to discuss a problem with someone in Aberdeen. The system was used very effectively on the Andrew platform where there was a direct link from the control room to one of the contractors, and they were able to look at each other on a screen, discuss problems and see any piece of equipment, diagram or chart without the contractor having to go to the platform. 'It is,' says Mackenzie, 'an area where we need enormous faith. It is a powerful technology when it works well.'

MOVESople

Professor Graeme Simpson has been appointed to the first Schlumberger Chair of Energy Industry Management at the University of Aberdeen. Professor Simpson,



who recently took up his post in the Department of Management Studies, will be working within the context of the University's Oil and Gas Institute, initiating inter-disciplinary research and industrial training.

Steve Wayman and Phil Raven have been appointed Joint Group Managing Directors by JP Kenny Engineering to succeed John Kenny and Paul Davies. Wayman and Raven, both existing Directors within the company, will take over their new roles on 1 January 1998.

Steven John Holliday has been appointed Executive Director of British-Borneo. Holliday will relocate to London and will be responsible for international



business development outside the US and north-west Europe.

Asbjoern Larsen, Chief Executive of Saga Petroleum, will be replaced next year by Diderik Schnitler. Larsen has been with Saga for 25 years, serving as Chief Executive for 20 years. Schnitler is currently an Executive Vice-President of Kvaerner, where his responsibilities include the company's shipbuilding operations.

Measurement Technology has appointed Steve Evans as Business Development Manager.

Fred Doll, a Chartering Analyst with Exxon Company International based in New Jersey, has been appointed Senior Shipping Analyst to Clarksons. He took



up his appointment in London last month.

Kvaerner John Brown has appointed Alan Thorne and Ed Cavanagh to its Hydrocarbons business. Thorne, joining from British Gas, will take up his position of Business Manager – Pipelines in London. Cavanagh, formerly Pipeline Department Head, Fluor-Williams Brothers, will take the position of Vice-President – Pipelines Americas based in Houston, Texas.

BJ Services Company has announced the appointment of several new managers: **Phil Rae** as Region Marketing Manager of the Far East Region, based in Singapore; **Garth Gregory** as Business Development Manager of Pumping Services for the Europe-Africa Region based in Aberdeen; and **Gary Broiles** as UK Country Manager, also based in Aberdeen. Gregory and Broiles will work on the company's well services side, and report directly to **Rick Needoba**, Region Manager of the Europe and Africa Region.

Kevin Dean has been appointed Business Development Manager for the petrochemical market by Zellweger Analytics. Dean will develop sales and marketing activities for all the company's environmental monitoring products and services. The company has also promoted **Tim Matthews** to the position of European Sales Manager for the petrochemical market.

Bryant Chapman has been appointed Operations Manager for the North and Central North Sea by Amoco (UK) Exploration Company.



Chapman was previously in charge of the Everest and Lomond gas fields.

John Bergman has been named President of Consulting at MPSI Systems. In his new role he will be responsible for the company's initiatives into the petroleum retail consulting business.

Apache Corporation has announced that F H (Mick) Merelli has been elected to its Board of Directors. Merelli is Chairman of the Board, President and Chief Executive Officer of Denver-based Key Production Company. The company also announced that **Robert V Gisselbeck** is retiring from the company's Board of Directors after 15 years service. Atlantic Power has appointed Doug Elsby as Commercial Director. Formerly Asset Manager for the company's alliance partner



Oryx Energy, Elsby was instrumental in bringing the company into operatorship of the Hutton and Murchison fields.

Dr Geoff Tobin FIChemE, FRSC, has been appointed Senior Process Manager at M.W. Kellogg's European headquarters in London. Tobin previously worked as a Senior Consultant for Foster Wheeler and BP.

John Hutton, who was recently appointed European Representative for the Syntroleum Corporation, will be heading its European office based in Surrey. Hutton will provide representation and licensing support throughout Europe for the company's gas-to-liquids technology.

Tim Knott, currently Corporate Treasurer for BHP Petroleum, has been appointed Group General Manager, Finance and Administration following the resignation of Chief Executive **John O'Connor**.

Karen Thurtell has been appointed Head of Customer Service for Centrica. For the past three years she has been Head of Customer Relations for Centrica's gas supply business, British Gas Trading.



Darren Reeder (far right) has been appointed Director of Sales of ASEP (BV), responsible for the company's range of well service technologies. *Mike Halton* (left) has been appointed General Manager, responsible for streamlining productivity. Both will be based in The Netherlands. *John Verling* (far left) joins the company as Director of Sales and Marketing and *Andre Ven Der Ende* (right) becomes Technical Director; both will be based in Aberdeen.

Climate change the BP view

What John Browne actually said at Stanford

When John Browne, Chief Executive, BP, delivered his speech about global climate change at Stanford University, California, on 19 May, 1997, he staked out a position that was interpreted as being at odds with the traditional oil company view on global warming. As our article on page 456 shows, some people in the industry, in private, view the speech as some sort of betrayal of oil industry solidarity while environmental groups have quoted selective passages to fit their own agendas. Petroleum Review is pleased to publish this slightly shortened version of his speech so that readers can judge for themselves what was said and the possible implications for the industry.

think it's right to start by setting my comments in context. Following the collapse of Communism in Europe and the fall of the Soviet Empire at the end of the 1980s, two alternative views of the consequences for the rest of the world were put forward. Francis Fukuyama wrote a book with the ironic title *The End* of *History*. Jacques Delors, then President of the European Commission, talked about the 'Acceleration of History'.

In the event, history has neither accelerated nor stopped. But it has changed. The world in which we now live is one no longer defined by ideology. Of course, the old spectrums are still with us – of left to right, of radical to conservative – but ideology is no longer the ultimate arbiter of analysis and action.

The passing of some of the old divisions reminds us we are all citizens of one world, and we must take shared responsibility for its future, and for its sustainable development. The global environment is a subject which concerns us all, in all our various roles and capacities. I believe we've now come to an important moment in our consideration of the environment.

A year ago, the Second Report of the Inter-Governmental Panel on Climate Change (IPCC) was published. That report, and the discussion since its publication, shows that there is mounting concern about two stark facts: the concentration of carbon dioxide in the atmosphere is rising, and the temperature of the earth's surface is increasing.

Karl Popper once described all science as being provisional. What he meant by that was that all science is open to refutation, to amendment and to development. That view is certainly confirmed by the debate around climate change.

There's a lot of noise in the data. It is hard to isolate cause and effect. But there is now an effective consensus among the world's leading scientists and serious and well informed people outside the scientific community that there is a discernible human influence on the climate, and a link between the concentration of carbon dioxide and the increase in temperature.

The prediction of the IPCC is that over the next century temperatures might rise by a further 1 to 3.5°C, and that sea levels might rise by 15 to 95 cm. Some of that impact is probably unavoidable, because it results from current emissions.

Those are wide margins of error. But it would be unwise and potentially dangerous to ignore the mounting evidence. The time to consider the policy dimensions of climate change is not when the link between greenhouse gases and climate change is conclusively proven-but when the possibility cannot be discounted and is taken seriously by the society of which we are a part.

We in BP have reached that point. It is an important moment for us. We must now focus on what can and what should be done, not because we can be certain climate change is happening, but because the possibility can't be ignored.

How should we respond to this mixture of concern and uncertainty? I think the right metaphor for the process is a journey. Governments have started on that journey. The private sector has also embarked upon the journey–but now that involvement needs to be accelerated.

As I see it, there are two kinds of actions that can be taken in response to the challenge of climate change. The first kind of action would be dramatic, sudden and surely wrong. Actions which sought, at a stroke, drastically to restrict carbon emissions or even to ban the use of fossil fuels would be unsustainable because they would crash into the realities of economic growth. They would also be seen as discriminatory, above all in the developing world.

The second kind of action is that of a journey taken in partnership by all those involved. A step-by-step process involving both action to develop solutions and continuing research that will build knowledge through experience.

BP is committed to this second approach, which matches the agreement reached at Rio based on a balance between the needs of development and environmental protection. What we propose to do is substantial, real and measurable. I believe it will make a difference.

The facts

Of the world's total carbon dioxide emissions only a small fraction comes from the activities of human beings, but it is that small fraction which might threaten the equilibrium between the much greater flows.

You could think of it as the impact of placing even a small weight on a weighscale which is precisely balanced. But in preserving the balance we have to be clear where the problem actually lies.

Of the total carbon dioxide emissions caused by burning fossil fuels only one-fifth comes from transportation. Four-fifths comes from static uses of

Climate change the BP view



John Browne is Chief Executive of BP. This article is based on a speech given at Stanford University on 19 May 1997.

energy-the energy used in our homes, in industry and in power generation. Of the total, 43% comes from petroleum.

Our own operations in exploration and in refining produce around 8mn tonnes of carbon annually. A further 1mn tonnes is produced by our chemical operations.

If you add to that the carbon produced by the consumption of the products we produce, the total goes up to around 95mn tonnes. That is just 1% of the total carbon dioxide emissions which come from all human activity.

As a company, our contribution is small, and our actions alone could not resolve the problem. But we have a responsibility to act, and I hope that through our actions we can contribute to the much wider process which is desirable and necessary. We're therefore taking five specific steps.

Controlling emissions

First, we will monitor and control our own carbon dioxide emissions. These result from burning hydrocarbon fuels to produce heat and power, from flaring feed and product gases, and directly from the process of separation or transformation.

So far our approach to carbon dioxide has been indirect and has mainly come through improvements in the energy efficiency of our production processes. Over the last decade, efficiency in our major manufacturing activities has improved by 20%.

We have to continue to improve the efficiency with which we use energy. And in addition we need a better understanding of how our own emissions of carbon can be monitored and controlled, using a variety of measures including sequestration.

We have already taken some steps in the right direction. In Norway, for example, we've reduced flaring to less than 20% of 1991 levels. Our experience in Norway is being transferred elsewhere, and our goal is to eliminate flaring except in emergencies.

That is one specific goal within the set of targets which we will establish. Some are straightforward matters of efficient operation, such as the reduction of flaring and venting. Others require the use of advanced technology in the form of improved manufacturing and separation processes that produce less waste and demand less energy.

Other steps will require investment to make existing facilities more energy efficient. For instance we're researching ways in which we can remove the carbon dioxide from large compressors and reinject it to improve oil recovery. That would bring a double benefit: a cut in emissions and an improvement in production efficiency.

The task is particularly challenging in the refining sector, where the production of cleaner products requires more extensive processing and a higher energy demand for each unit of output. That means that to make gasoline cleaner, with lower sulfur levels, takes more energy at the manufacturing stage. That's the trade off.

In each case our aim will be to establish a database, including benchmark data, to create a monitoring process, and then to develop targets for improvement through operational line management.

Support for science

Our second step is to increase the level of support we give to the continuing scientific work which is necessary. More research is needed on the detail of cause and effect; on the consequences of what appears to be happening, and on the effectiveness of the various actions which can be taken.

We've joined a partnership to design the right technology strategy to deal with climate change. That partnership, which will work through the Batelle Institute, includes the Electric Power Research Institute and the US Department of Energy.

We're also supporting work being done at MIT in Cambridge, Massachusetts, and through the Royal Society in London. And we're joining the greenhouse gas programme of the International Energy Agency, which is analysing technologies for reducing and offsetting greenhouse gas emissions from fossil fuels.

Joint implementation

The third area is the transfer of technology and the process of joint implementation, which is the technical term for projects which bring different parties together to limit and reduce net emission levels of greenhouse gases.

Joint implementation is only in its infancy, but we believe it has great potential to contribute to the resolution of the climate change problem. We've begun by entering into some specific programmes of reforestation and forest conservation programmes in Turkey and Bolivia, and we're in discussion on a number of other technology-based joint implementation projects.

Technology transfer is part of the joint implementation process but it should go wider. We're prepared to engage in an open dialogue with all the parties who are seeking answers to the climate change problem.

Developing alternatives

The fourth step-the development of alternative energy-is related but distinct.

Looking ahead, it seems clear that the combination of markets and technology will shift the energy mix. The world's population is growing by 100mn every year. Prosperity is spreading. Both these factors will shape a growing level of demand for energy.

At the same time technology moves on. The sorts of changes we've seen in computing, with continuing expansion of semiconductor capacity, are exceptional but not unique. I think it is a reasonable assumption that the technology of alternative energy supplies will also continue to move forward. One or more of those alternatives will take a greater share of the energy market as we go into the next century. But that is not instead of oil and gas-it is additional.

We've been looking at alternative energies for a long time, and our conclusion is that one source which is likely to make a significant contribution is solar power. At the moment solar is not commercially viable for either peak or base load power generation. The best technology produces electricity at something like double the cost of conventional sources for peak demand.

But technology is advancing and, with appropriate public support and investment, I'm convinced that we can make solar competitive in supplying peak electricity demand within the next 10 years.

We have a 10% share of the world market for solar power. The business operates across the world, with operations in 16 countries. Our aim now is to extend that reach-not least in the developing world, where energy demand is growing rapidly.

Public debate

Our fifth step will be to contribute to the public policy debate, in search of wider global answers to the problem. We're already engaged in that debate through the World Business Council on Sustainable Development, through the President's own Council in the US, and in the UK where the Government is committed to making significant progress on the subject.

Our instinct is that once clear objectives have been agreed, market-based solutions are more likely to produce innovative and creative responses than an approach based on regulation alone. Those market based solutions need to be as wide ranging in scope as possible, because this is a global problem which has to be resolved without discrimination and without denying the peoples of the developing world the right to improve their living standards.

There have been a number of experiments, all of them partial, but many of them interesting because they show the way in which effective markets can change behaviour. We're working, for instance, with the Environmental Defense Fund to develop a voluntary emissions trading system for greenhouse gases, modelled on the system already in place in respect of sulfur.

Sustainable growth

No company can be really successful unless it is sustainable, unless it has capacity to keep using its skills and to keep growing its business. Of course, that requires a competitive financial performance. But it does require something more, perhaps particularly in the oil industry.

The whole industry is growing because world demand is growing. The world now uses almost 73mn barrels of oil a day, 16% more than it did 10 years ago. In another 10 years, because of the growth of population and prosperity, that figure is likely to be over 85mn barrels a day, and that is a cautious estimate.

For efficient, competitive companies that growth will be very profitable. But sustainability is about more than profits. Real sustainability is about simultaneously being profitable and responding to the reality and the concerns of the world in which you operate.

I disagree with some members of the environmental movement who say we have to abandon the use of oil and gas. They think it is the oil and gas industry which has reached the end of history. I disagree because I think that view underestimates the potential for creative and positive action.

But that disagreement doesn't mean that we can ignore the mounting evidence about climate change and the growing concern. As businessmen, when our customers are concerned, we'd better take notice.

To be sustainable, companies need a sustainable world. That means a world where the environmental equilibrium is maintained but also a world whose population can all enjoy the heat, light and mobility which we take for granted and which the oil industry helps to provide. I don't believe those are incompatible goals. All the actions we're taking are directed to ensuring that they are not incompatible.

There are no easy answers, no silver bullets. Just steps on a journey which we should take together because we all have a vital interest in finding the answers.

History hasn't ended; it's moved on. Francis Fukuyama describes the future in terms of the need for a social order-a network of interdependence which goes beyond the contractual, an order driven by the sense of common human interest. Where that exists, societies thrive. Nowhere is the need for that sort of social order-at the global level-more important than in this area. The achievement of that has to be our common goal.

Forthcoming Conference

The European Downstream Industry – A Vision for 2010

11–12 December 1997, Paris/Rueil-Malmaison

A joint AFTP-IP-DGMK Symposium (administrated by AFTP)

Since the early 1980s the European downstream industry has experienced major changes including plant closure, upgrading programmes and other initiatives to improve overall efficiency.

The Symposium provides a vision of how the European downstream industry will adapt and evolve over the next decade. Over the next 10 to15 years further significant changes are anticipated resulting from:

- changes to European and domestic legislation to resolve health, safety and environmental issues;
- the need to compete with alternative sources of energy;
- the desire to meet customer/market demand both in terms of quantity and quality of products;
- the need to maximize margins from refined products.

The Symposium is jointly sponsored by Association Française des Techniciens du Pétrole (AFTP), Deutsch Wissenschaftliche Gesellschaft für Erdöl, Erdgas und Kohle (DGMK) and the Institute of Petroleum (IP).

Who should attend?

General Managers – Strategists and Planners – Refinery Managers and Engineers – Logistics Managers – Engineering Managers – Marketing Managers – Regulatory Authorities – Equipment Manufacturers – Service Companies.

For further information please contact: IP Conference Department on +44 (0)171 467 7105

marine loss

Crude oil marine loss database continues to expand

The Institute of Petroleum's PM-L-4(A) crude oil marine loss database panel collects and analyses worldwide crude oil shipping data with the general aim of improving loss control through a better understanding of loss patterns and trends. anel members submit their company data which is analysed confidentially. An annual report is issued individually to all members. This report includes analysis of the individual company data together with a global analysis of the entire annual data set. The following paragraphs provide an overview of the latest database developments.

Membership of the Panel has grown steadily since work began in 1986 and the following 19 companies submitted their data for 1996:

AGIP Petroli Arco Pipe Line Company BP Oil Chevron International Conoco Elf France Elf International Exxon Company International Marathon Mobil Petrofina Petrogal PMI Pemex Phillips Repsol Petroleo Shell Statoil Sun Oil Company Total Amerada Hess and Petrobras are planning to submit data for 1997 and this will bring membership to 21.

Membership is open to all users and producers of crude oil and companies interested in joining the Panel should contact the Chairman of PM-L-4(A) via the Institute of Petroleum.

Database growth

The size of the database has increased over the years, due partly to the growth in membership but also as a result of existing members gathering data from additional affiliates.

This growth in volume is shown in **Figure 1** with the 1996 total standing at 3.27bn barrels for voyages with full load and discharge data.

To allow year on year comparisons a global weighted net loss figure is calculated each year using a standard basket of crudes. These figures are also plotted in **Figure 1** and the overall improvement since 1989 is readily apparent. Global weighted loss for



1996 stands at -0.22% (by convention losses are given as negative).

It should be noted that the losses referred to are generally apparent or paper losses rather than real losses and occur due to a combination of fixed and random errors in the measurement systems and methods used at load and discharge. However, these losses or measurement differences can have an important financial impact.

Data for over 5,500 individual voyages was submitted in 1996 with bills of lading (BOL) totalling in excess of 4bn barrels. Of these 4,400 had full bill of lading and out-turn data from which the loss information was derived. The volume total for these voyages was over 3.27bn barrels, representing an increase in database volume of 17% over 1995.

Comparing with independent estimates of world seaborne trade¹ the database in 1995 contained 27% of the world total. Comparative figures for 1996 have not yet been published but it is estimated that over 30% of world seaborne crude is included in the 1996 database.

Database development

In addition to expanding the size of the database in order to improve the representation and to include data for additional crude oil types and ports the Panel continues to review and implement appropriate additions to the range of data collected and to improve the analysis and reporting methods.

Table corrections

For 1996, data input and reporting was extended to include both raw and 'table corrected' BOL figures. For most voyages the standard volume calculations at load and discharge port are carried out using the same volume correction tables to convert ambient measurements to volumes at standard temperature and pressure. These tables were issued in 1980.

However, a number of load ports continue to use pre-1980 tables and where loading calculations are performed using these older tables, and discharge calculations are performed using the later tables, a difference or 'loss' generally occurs the size of which depends on the crude density and the temperature difference between load and discharge. This 'table difference' is superimposed on any other discrepancies between load and discharge measurements.

For those load ports affected the database now carries table corrected load data in addition to original BOL figures so that the effect of table dif-



ference can now be removed to allow more direct comparison between losses.

For over 200 voyages from ports using the old tables losses reduced from 0.30% to 0.25% when BOL figures were recalculated using new tables.

Vessel experience factor corrections

In 1996 ship measurements incorporating vessel experience factor (VEF) corrections were prepared and reported. As VEFs are developed from shore/ship differences at loading, application of these factors to the ship measurements on a global basis simply tends to reduce mean shore to ship differences at load to zero. However, use of corrected figures for individual ports reduces scattering in the data by removing the random uncertainty relating to ship calibration.

Figure 2 shows load differences for a typical port through 1996 and clearly illustrates the reduced scatter in VEF corrected load loss data. The uncorrected data also masks a trend towards





Database

marine loss

Crude type	API gravity	Overall vo	Overall volumes (NSV)		Calculation by voyage 1996 1995			1995		
		Total	Barrels	Barrels	NS	V loss	%	NSV	loss %	
		barrels	loss	loss %	Mean	Std dev	No No	Mean	Std dev No	
Alaskan North Slope	30.2	382,698,409	-383,766	-0.10	-0.10	0.24	419	-0.09	0.22 277	,
Alba	20.0				_	_	12	0.09	0.44 27	
Amna	37.2	28,246,487	-51,264	-0.18	-0.18	0.23	53	-0.14	0.25 44	
Arab Ex Lt	36.7	29,153,200	-89,525	-0.31	-0.26	0.30	30	-0.13	0.46 44	
Arab Heavy	27.5	16,600,152	-62,862	-0.38	-0.38	0.55	43	-0.24	0.64 56	
Arab Light	32.8	229,258,139	-543,180	-0.24	-0.15	0.36	264	-0.20	0.40 267	
Arab Medium	30.2	83,272,960	-255,455	-0.31	-0.24	0.36	85	-0.25	0.33 82	
BCF 17	17.1	12,227,669	-11,889	-0.10	-0.10	0.37	26	_		
Belayim	28.0	16,700,535	-47,957	-0.29	-0.28	0.28	34	-0.31	0.36 53	
Bonny Light	35.4	59,042,565	-68,603	-0.12	-0.11	0.45	72	-0.17	0.31 33	
Bonny Medium	28.0	13,387,734	-2,474	-0.02	0.01	0.67	31	-		
Bouri	26.2	17,494,500	-77,140	-0.44	-0.44	0.56	32	-0.34	0.38 32	
Brass	40.6	21,139,921	-68,649	-0.32	-0.30	0.32	25	-		
Brent	38.1	74,878,477	-47,019	-0.06	-0.07	0.16	102	-0.08	0.17 115	
Bu Attifel	40.4				_	-	1	0.19	0.36 76	
Cabinda	33.0	29,050,223	-31,139	-0.11	-0.07	0.40	35	-0.08	0.30 45	
Djeno	26.8				_	_	-	-0.18	0.32 27	
Dubai	31.7				-	_	_	-0.15	0.23 36	
Ekofisk	38.9	73,441,904	-42,494	-0.06	-0.06	0.12	117	-0.05	0.15 115	
Es Sider	36.8	17.954.681	-77.006	-0.43	-0.43	0.21	31	-0.45	0.70 43	
Escravos	36.1	70,660,986	-87.958	-0.12	-0.12	0.35	72	-0.10	0.32 59	
Flotta	37.2	45,708,839	-129 220	-0.28	-0.78	0.24	72	_0.10	0.18 65	
Forcados	29.8	36 461 764	-28 597	-0.08	-0.09	0.26	45	_0.07	0.35 33	
Forozan	30.5	35 061 419	-112 923	-0.32	_0.38	0.70	67	_0.22	0.44 22	
Forties	40.3	138 892 051	-208 252	-0.15	-0.13	0.18	186	-0.25	0.71 121	
Fulmar	39.2	23 300 352	41 377	0.18	0.15	0.10	31	0.04	0.21 131	
Furrial	30.3	13 178 060	-27 608	-0.21	-0.21	0.22	23	_0.30	0.20 40	
Gullfaks	32.2	144 099 840	-295 753	_0.21	-0.21	0.23	178	-0.30	0.55 52	
Heidrun	28.4	14 315 135		-0.03	-0.21	0.14	72	-0.19	0.15 199	
Iranian Heavy	30.0	44 902 845	-78 615	_0.18	-0.04	0.25	71	0.25	0.20 00	
Iranian Light	33.4	33 725 143	-61 784	-0.18	-0.14	0.55	56	-0.35	0.35 50	
Isthmus	32.9	33,723,143	-01,704	-0.10	-0.10	0.40	50	-0.20	0.35 05	
Kuwait	31.0	22 614 872	-26 602	0.16	0.12	0.20	26	-0.19	0.20 25	
Leona	24.2	22,014,072	-30,003	-0.10	-0.15	0.59	20	-0.08	0.49 30	
Maya	21.6	94 026 336	-210.056	_0.22	0.26	0.25	151	0.10	0.4/ 22	
Mesa	30.1	12 282 156	-12 905	-0.22	-0.20	0.35	151	-0.19	0.54 155	
Murban	39.3	12,505,150	-13,095	-0.11	-0.11	0.52	22	0.27	0.10 25	
Olmeca	38.8	61 138 094	-165 440	-0.27	0.27	0.24	112	-0.27	0.10 35	
Oriente	26.1	7 954 624	9 912	-0.27	-0.27	0.24	21	-0.30	0.24 94	
Oseberg	36.7	63 293 063	24 712	0.11	0.11	0.34	21	0.17	0.19 62	
Qualboe	35.0	24 259 125	-34,713	-0.05	-0.07	0.17	24	-0.17	0.18 03	
Russian Export Blend	33.3	129 214 811	2,009	0.00	0.01	0.27	24	0.15	0.24 120	
Sahara Blend	45.5	63 /01 /04	-101 740	-0.21	-0.18	0.35	105	-0.15	0.34 120	
Sarir	37.6	22 001 209	_90 211	-0.10	-0.16	0.25	105	-0.11	0.21 /1	
Siberian Light	35.2	18 755 005	-00,311	-0.35	-0.36	0.27	41	-0.17	0.28 33	
Souedie	24.4	12,422,300	-29,709	-0.16	-0.14	0.23	41	0.14	0.24	
Statfiord	124.4	192 147 622	-19,633	-0.10	-0.17	0.27	21	-0.14	0.34 39	
Svrian Light	42.0	102,147,033	142 742	-0.30	-0.36	0.15	21/	-0.34	0.17 209	
Troll	40.0	26 220 255	-143,743	-0.33	-0.32	0.29	17	-0.31	0.31 /5	
IIOII	20.4	20,329,235	0,122	0.02	0.03	0.15	4/	 -		

Table 1: Analysis by Crude Oil Type 1996

	NSV I	oss %				
Crude type	Original	Table corrected	Table difference %			
Amna	-0.24	-0.23	0.01			
Arab Ex Lt	-0.35	-0.15	0.19			
Arab Light	-0.31	-0.16	0.15			
Arab Medium	-0.52	-0.43	0.09			
Sahara Blend	-0.20	-0.17	0.04			
Sarir	-0.43	-0.42	0.01			
Souedie	-0.24	-0.22	0.02			
Syrian Light	-0.38	-0.33	0.05			
Table 2: Effect of Table Corrections						

reduced differences which is apparent when the corrected data is plotted.

The frequency plot of the same data in **Figure 3** shows that the VEF corrected data provides a much better tool for control purposes than the raw data.

Loss distribution

The frequency distribution of losses for individual voyages for 1996 is shown in **Figure 3** and as for previous years closely follows the normal distribution. The mean loss for 1996 was -0.19% with a standard deviation of 0.35%. If only table corrected or more precisely table consistent data is considered the mean net standard volume (NSV) loss reduces to 0.18% with the same standard deviation.

Loss comparison for individual crude oils

Table 1 shows losses grouped by crude type. It gives mean NSV loss and standard deviation for shipments of the most popular crudes in the database (20 or more voyages with full data). The mean of the reported API gravity is also given together with the overall percentage loss based on total barrels shipped.

For comparison, figures for NSV loss calculated by voyage are given for 1996

and 1995. Nine additional crudes are included this year but seven are not reported for 1996 as the number of data sets for these crudes has fallen below 20. API gravity for these crudes is given as the 1995 mean value.

Most of the entries show little or no change from 1995 figures and while there are a number of significant changes it is not possible to comment in depth on these in this article.

Note that the data is not table corrected (see earlier) but based on original BOL figures. The effect of using table corrected BOL data for specific crudes is shown in **Table 2**.

Detailed loss analysis

In addition to NSV loss figures the database contains details of all measurements made through each voyage. This enables more detailed analysis to determine where losses are occurring and again sets realistic performance limits for each stage in the measurement process.

Overall results for each of the main measurement differences are shown in **Table 3**, comparing unweighted figures for 1996 with those for 1995. There is no significant difference between the two sets of results and indeed no difference when compared with 1994 data.

	1996		19	95
	Mean	Std dev	Mean	Std dev
NSV loss %	-0.19	0.35	-0.19	0.36
TCV loss %	-0.12	0.33	-0.12	0.35
Load difference %	+0.16	0.41	+0.17	0.39
Ship loss %	+0.02	0.18	+0.03	0.21
Discharge difference %	-0.31	0.41	-0.31	0.41
Water loss %	-0.07	0.17	-0.07	0.20
ROB difference %	+0.04	0.15	+0.04	0.15
Table 3: Global Loss Analysis				

NSV and total calculated volume (TCV) losses are simple comparisons between BOL and out-turn figures. NSV is the volume of crude corrected to 60°F with sediment and water quantities (free and dissolved) deducted. TCV is the NSV plus sediment and free and dissolved water.

Load and discharge differences are the differences between ship received/delivered TCV and shore TCV measurements at loading and discharge. These are not corrected for VEF.

Ship loss or 'transit difference' is the difference between ship TCV measurements at the load port before sailing and at the discharge port on arrival.

Water loss is the difference between bill of lading and out-turn water and sediment, adjusted for ROB/OBQ water difference where figures are available. ROB difference is the difference between the TCV measured on the ship prior to loading (OBQ) and that remaining after discharge (ROB).

Conclusion

The 1996 data indicates that the reductions in weighted loss due to significant improvements for a number of high volume crudes which were noted in 1994 and 1995 have been maintained.

Weighted average NSV loss for 1996 stands at -0.22%.

Inclusion of table and VEF corrections allow better comparison of load port measurements and provides for better monitoring of measurements at both load and discharge ports.

The growth of the database is encouraging with over 30% of world seaborne crude included for 1996. However, there are still some areas which are not well represented and, of course, all additional data adds to the value of the information which is derived from it.

Continued cooperation between individual loss control groups and producers' representatives is an essential part of the process of understanding marine losses, providing the basis for improving standards. Oil companies are urged to continue their support of these activities.

References

1. World Bulk Trades 1996, Fearnleys, Oslo. Norway.

Any questions or comments on the content of this paper or any other aspects of the activities of the Panel should be addressed to the Chairman of PM-L-4 Panel at the Institute of Petroleum.

Diary Date

IP Week: 16–19 February 1998



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

An influential programme of conferences appealing to an international audience has been planned, which together with the Annual Luncheon and Dinner, will form the core of IP Week 1998. The exceptionally high quality of speakers at the conferences, Annual Luncheon and Dinner means that IP Week 1998 represents an excellent opportunity for delegates to meet and discuss the latest developments with senior executives in the industry today.

'Over recent years, the IP's conferences have attracted ever-increasing support from senior oil industry figures from around the world and IP Week 1998 will be no exception' David Setchell IP President, (above)

Monday 16 February

International Conference on 'Oil and Gas after 2000'

This international conference will focus on moves to realign and restructure the industry's operations in response to recent pressures involving mergers, joint ventures, alliancing, asset swaps and closures of facilities, together with new processes and practices for the management of the business both within individual companies and among the participants in partnerships and consortia.

Speakers include: Richard Giordano (Chairman, BG plc), Peter Sutherland (Chairman, British Petroleum plc), Antonio Carlo de Agostini (Exploration and Production Director, Petrobras, Brazil).

Tuesday 17 February

Annual Luncheon

Guest of Honour and Speaker: Dr Mark Moody-Stewart

(Chairman of Shell Transport & Trading)

This year's event, in one of London's premier hotels, attracted a record number of senior oil executives. They were addressed by Lucio A Noto, Chairman and Chief Executive Officer of Mobil Corporation, who spoke about the forthcoming BP/Mobil joint venture.

Next year, Dr Mark Moody-Stuart, Chairman of Shell Transport and Trading will address the guests. It is anticipated that the luncheon will attract in excess of the 450 who came to this year's event.

Tuesday 17 February continued

Mark Moody-Stuart took over as Chairman of Shell Transport and Trading in July of this year. He became a member of Shell's Committee of Managing Directors in 1991. Dr Moody-Stuart's whole working life has been spent within the Shell Organisation, predominantly in countries outside Europe. In the mid-1970s he headed up Shell's team exploring the North Sea and developing the early giant oilfields such as Brent, Cormorant and Fulmar.

New Ways of Working, New Approaches and New Technologies – Now and into the Future

organized in association with

ANDERSEN and ARTHUR CONSULTING ANDERSEN

As part of the IP Week 1998 programme of events, there will be an Exhibition of different working approaches with presentations of systems, solutions and technologies recently developed and implemented by leading oil companies worldwide. The Exhibition will be held in the afternoon at the Dorchester Hotel, also the venue for the IP Annual Luncheon.

There will be demonstrations and information on:

- Knowledge Management Systems and Concepts
- Shared Services
- The Global Office
- The Internet and E-Commerce



The backdrop of the luxurious dining-room at the Dorchester Hotel featuring Lucio A Noto addressing the 450-strong audience earlier this year. The 1998 Guest Speaker at the Annual Luncheon will be Dr Mark-Moody Stewart, Chairman of Shell Transport and Trading.

Wednesday 18 February

Price Risk Management: The 11th Oil Price Seminar

Oil price volatility has been with us since the oil shocks of the early 1970's. Since then, there continues to be rapid developments in ways of managing the resultant price risks.

The international Price Risk Seminar will review the instruments available to manage risks, both on and off exchange, and the management control systems that ensure sound financial management of hedging programmes. It will also look at managing more complex scenarios and will include a specific case study.

Chaired by Anthony Belchambers, (Chief Executive, Futures and Options Association), speakers include: Sally Clubley, (Managing Partner, Arktauros); John Higgins, (Senior Manager, Ernst & Young); Isabel Whitley, (Vice-President Commodities, Morgan Stanley); and John D Van Meter, (President, Ashland Oil International Ltd).

Supported by

New York Mercantile Exchange

Annual Dinner

The Annual Dinner at the world-famous Grosvenor House Hotel will be host to some 1,500 of the world's senior oil executives. Last year's Keynote Speaker was Governor of the Bank of England, Eddie George. This year's speaker has not yet been announced but in keeping with the dinner's tradition promises to be a senior figure on the international arena.

For full details and ticket application form, see inside back page of this issue.



The Great Room at the Grosvenor House Hotel is the only venue in London capable of accommodating all the guests at the Dinner. The event continues to be one of the highlights of the year in the oil and gas industry social calendar.

Thursday 19 February

International Conference on 'Innovations in Offshore Field Developments'

This is a one day 'Tour d'Horizon' of the most significant recent international oil and gas field developments focusing on innovative technology and on new contractual and organizational structures.

Chairman and speakers include: Rex Gaisford (Director of International Development, Amerada Hess International Ltd), Don Vardeman (Oryx Energy, USA), Luiz Eduardo Guimaraes Carneiro (E&P Executive Superintendent, Petrobras, Brazil), Harvey Smith (President, Hibernia Management and Development Company, Canada) and Andy Tillbrook (New Technology Co-ordinator, Amerada Hess International Ltd).

For further information:

The programmes and registration forms for the conferences/seminar, together with the Annual Luncheon ticket application form will be available at the end of October.

Please contact the Conference Department to add your name to the mailing list.

For a ticket application form for the Annual Dinner, please see inside back page of this issue. Pauline Ashby, Conference Department Tel: +44 (0)171 467 7100 Fax: +44 (0)171 255 1472

PETROLEUM REVIEW OCTOBER 1997

The challenge of the Second Oil Boom?

The international upstream oil industry is facing a series of challenges: declining reserves in the West; increased competition from a wider spectrum of companies, including national firms in developing countries; growing energy demand; higher and more costly safety and environmental standards; and having to pay more for exploration licences. The recent Third Millennium International Petroleum Conference in London, organized by Petroconsultants and **Global Pacific, examined** these challenges. Mike Wells reporting on the conference notes that the future could be 'a golden age of exploration', but there is also the possibility that the industry will fail to capitalize on the opportunities.

ccording to Steve Comstock, Mobil Oil's Vice-President of Global Business Strategy, the attributes an oil company would need to face the challenges and be successful in the Third Millennium are: to be able to partner with others, have a truly global perspective, maintain a balanced portfolio to manage risk, be strongly technology-oriented, and be able to attract an innovative workforce.

However, there are warning signs. There have been occasions in recent years when oil companies invested huge sums to win over the competition such as the OCS 72 leases in the Gulf of Mexico, the period in the early 1990s in Russia, where 'we fell over each other promising the moon', and in Vietnam licensing. The warning is that even in the geologically successful cases money had not been made – single digit returns at best – largely because of the high upfront bonuses and royalty bids made to secure access.

Now, 'following a year of relatively high oil prices, fat pockets, and some new players who may not remember the lessons we should have learned, just what is happening in Venezuela, Turkmenistan, Uzbekistan, and around the rest of the world today?' There was, Comstock said, a current global fervour for high bids, concessions on terms, escalating rig rates and increased headhunting.

The Texas bumper sticker in the 1980s had pleaded 'Lord Give Us Another Oil Boom. We Promise Not to Screw It Up this Time'. 'You have to wonder', he said, 'if we are doing it again; if the wrong message is going out to developing nations that single-digit or low teens rates of return are acceptable. Could the Third Millennium oil patch plea be 'Whoops – screwed that one up too. Lord, third time's a charm... please give us another oil boom.'

Comstock pointed out that the major oil company earnings in 1996 compared to those for 1995 showed that the value of the produced barrel had been eroded by 8% as older production was replaced by higher cost, higher taxed production. The industry needs to find approximately 1.3 barrels today to replace the value of 1 barrel produced yesterday, to maintain earnings at constant prices.

The industry's upstream drivers were growth, profitability and most important,

people. Competition for new growth areas included the formation of new relationships with national governments and quasi-national oil companies. Meeting spiralling energy demand requires levels of new investment way beyond individual company resources. And the growth challenges demand new business methods not, Comstock said, 'our old "cowboy" practices'.

Sharing risk means diluting rewards, but partnering can add value to a project or process particularly as governments of developing nations are demanding terms usually now associated with proven provinces. New geopolitical challenges and instabilities require working with an effective global structure and culture that can react quickly and appropriately. The best insurance is to spread your bets: balancing a portfolio of assets across fiscal, physical, financial, cultural and organizational boundaries.

New geopolitics

David Melzer, formerly International Exploration Director of Premier Oil, reviewed energy's new geopolitics. The integration of Russia, the CIS countries, China and India into the world market economy was causing radical and painful political, economic and social changes within those countries and having an effect on the import/export balance for oil and gas. East Asia's energy consumption is already greater than that of Europe and is set to overtake the US in 2000.

Russian oil production has declined by more than 45% since 1987, but is projected to increase to about 8mn b/d by 2010, and a significant increase can be expected from the CIS countries once economic reform is established. In contrast, US production continues to decline and the country is becoming more dependent on cheap imported oil. As a result the US has a vested interest in the continued stability of those major oil producing and exporting countries in which its current containment foreign policy does not apply.

However, Melzer said, this economic containment, in the form of sanctions, embargoes, tariffs and restricted trade practices, probably affects 70% of the world's population. It is having a significant influence on oil and gas investment, production and exports.

It 'causes concern and tension because of the shortage of oil revenues in countries with increasing populations and growing expectations, causing a mounting problem in the Middle East'. The restriction to oil and gas development, and revenues, also raised the risk of religious fundamentalism increasing tensions in Saudi Arabia. Melzer quoted recent remarks by Zaki Yamani that the US policy would backfire and could cause an oil imbalance and the possibility of \$40/barrel oil.

Changing focus

He noted that as a result of the current containment policy US oil companies and contractors are being prevented from investing and participating in major developing projects and were having to change their geographical focus and regional strategies.

Arco provides a good example of the moves by many sizeable US upstream companies facing declining reserves at home to pursue opportunities overseas and their rationale was explained by International Exploration Vice-President James Robertson. Arco's approach was to apply core skills, successful in the US, to the projects and objectives of national oil company and government partners.

For example, Arco's expertise in miscible gas technology developed at Prudhoe Bay and elsewhere in the US is being applied successfully with Sonatrach in Algeria's Rhourde el Baguel field. Heavy oil experience and its refinery coking technology are being employed to upgrade extra-heavy crude in the Hamaca project of Venezuela's Orinoco Belt to 25° API oil suitable for export.

Unocal has gone further than most of the US firms by opening up a twin board-level corporate office in Kuala Lumpur earlier this year following a \$2-bn sell-off of underperforming downstream assets in California. Three years ago, said John Vandermeer, of Unocal Asia-Pacific President Ventures, the parent company had just begun regional projects mainly to meet Asia's spiralling demand. It aimed to be a prime supplier of piped gas across the region, and in providing low-cost energy solutions, having restructured 'a portfolio of opportunities from US economic risk to Far East political risk'.

A much smaller US independent is Triton Energy, of Dallas, which CEO Tom Finck said was focused on high potential prospects – 'a 100-mn barrel elephant hunter'. He gave as an example Triton's participation in the BP-operated Cusiana/Cupiagua deposits in Colombia, which he described as probably the largest in the western hemisphere, with capacity being raised to at least 500,000 b/d by the end of the year. The Colombian fields had been discovered, said Finck, 'because we used qualitative analysis and unconventional drilling techniques'.

Triton also has a share in five new large



With offshore drilling rigs currently commanding the highest rates seen in the last 15 years, companies are rushing to secure rig capacity for their exploration programmes while rig owners are sufficiently confident that they are increasing capacity with newbuildings, upratings and conversion of units back to drilling rigs

gas fields in the Gulf of Thailand in the Cakerawala A-18 area, whose targeted potential production is 650mn cf/d in 2002.

Finck asserted that the international industry was entering a golden age of exploration with potential for many sizeable hydrocarbon discoveries. Low finding and development costs should guarantee significant cash-flow margins.

For a company of Triton's size the lessons included having the right acreage inventory – large areas with good multi-plays to attract bigger companies; maintaining relationships with host governments and training local talent; and having the brightest innovative exploration thinkers.

But the biggest problem now, he said in an echo of Steve Comstock's statement, were the enormous bids being placed to buy into production and reserves, which were 'a long-term losing strategy for the whole industry'.

Other papers by Colombia, Venezuela, and Brazil were among the national producing companies setting out their more liberalized wares offering improved opportunities to foreign companies. However, it was a notable sign of the times that Venezuela's Third Round had involved 10 new international players, and that a total of 25 companies from around 10 countries were among the winning bidders.

Gabon, in person of Joseph Mbou-Ossamy, Director General of the Ministry of Mines, was also offering improved incentives, especially for deep and ultra-deep offshore areas. These include a favourable profit split for the companies and faster cost recovery. Typical royalty and tax payment agreements were being replaced by production sharing contracts and modified state participation with more favourable import duties.

Worldwide, the industry has increasing opportunities, but with greatly increased, and costly, competition. The question is, however, will it capitalize on its opportunities in the Third Millennium?

Sulfur and other elements – new legislation requires new analytical methods

As the oil industry responds to progressively tighter sulfur specifications, the choice of analytical technique is just one of the decisions which must be taken by refiners and blenders. New standard methods, using the more sensitive technique of Wavelength Dispersive X-ray Fluorescence (WDXRF) are being introduced for the measurement of sulfur and other environmentally significant elements. This versatile tool can also tackle many of the other elemental analyses commonly required in the oil and petrochemical industries. David Norman and Annette van der Vegt of Philips Analytical X-Ray BV, The Netherlands, explain the new analytical method.

A variety of well-tried classical and instrumental methods exist for the determination of sulfur in oil products. Some of the classical techniques are time consuming and labour intensive, and so in the QC laboratory instrumental methods are usually preferred. One of the most popular is Energy Dispersive X-ray Fluorescence (EDXRF), and hundreds of small analysers based on this principle are installed in plant and service laboratories around the world, using well established standard methods such as EN ISO 8754/IP336. Recently, however, the precision of this technique at the lower levels, now mandated in fuel products, has been questioned, and currently the lower range limit of this method is recommended by UK National Annexe at 0.1% m/m (1,000 mg/kg). The IP Standardization Committee is attempting to improve the precision of IP336 by conducting a large round-robin exercise, and the results will be incorporated in a new edition of the method, expected soon.

In the US, where 500 mg/kg sulfur in automotive fuels has been the norm for some time, ASTM D 2622 is the accepted instrumental method for measuring sulfur in fuels, and is referenced in the ASTM norm for automotive diesel, D 975. This method uses Wavelength Dispersive X-ray Fluorescence (WDXRF). The new ISO method using this technique, ISO 14596, will soon be introduced as one of the alternative test methods for determining sulfur in unleaded petrol (gasoline) EN 228 specification and in automotive diesel fuel EN 590 specification. Permitted sulfur levels are predicted to reduce further to 350 mg/kg and later 200 mg/kg. 'City diesel' is on the market now at only 50 mg/kg. Both WDXRF methods quote precision down to 0.001% m/m (10 mg/kg) and will therefore be applicable in most situations.

Other methods employing WDXRF include ASTM D 5059 for lead in gasoline, and IP407/ASTM D 4927 for additive elements in lubricating oils (Ba, Ca, P, S and Zn). A new ISO method will soon be published for nickel and vanadium (ISO 14597) – the measurement of vanadium is required by the ISO 8217 specification for marine fuels, and both elements are limited by national legislation in several countries. Methods for other elements are proposed or in the course of preparation. WDXRF is therefore a technique which merits serious consideration by the oil analyst, particularly with the introduction of more economical, lower cost systems.

Many applications

In addition to the elements mentioned above, WDXRF can determine all but a very few of the elements in the periodic table. It can also cope with a very wide range of analyte concentrations and sample types – from a few mg/kg of sulfur in diesel fuel to an additive component in a concentrate at the 50% level. **Table 1** lists some of the elements of interest to various sectors of the oil industry, all of which can be measured by WDXRF.

Basic principles

When a material is irradiated with X-rays, their energy causes its constituent atoms to be excited so that they fluoresce, emitting secondary X-rays. Each element present will emit its own uniquely

	Fuels	Lube and other oils additives	Process catalysts	Process catalyst poisons
AI	-		*	
As				*
Ba		*1,2		
Br	*3			
Ca		*1,2		
CI		*3		*
Co			*	
Cu		*	Sec. 19	*
Fe				*
Ge			*	-
Ir			*	
К	*			
Mg		*		
Mo			*	
Na	*			*
Ni	*3		*	*
Ρ	*3	*1,2		
Pb	*1		1.00	*
Pd			*	
Pt			*	
Re			*	
Rh			*	
S	*1,3	*1,2,3		*
Si	-		*	
Sn			*	
V	*3			*
Zn		*1,2		
Tabl	e 1: Ele Im 'A ? IP " IS	ements Meas portance in t STM Method Method O Method in Pr	urable by V the Oil Indu eparation or F	/DXRF of stry Proposed

characteristic fluorescent radiation, with an intensity directly related to the concentration of that element in the material. In the X-ray spectrometer, an X-ray tube is the source of primary X-rays used to irradiate the sample. (In some low-cost EDXRF systems, a radioactive source is used.) The fluorescent radiation from each element is then measured by a detector which converts the intensity of the fluorescence to an electrical signal. Different elements emit fluorescent radiation of different wavelengths (and hence different energies) and these differences can be utilized to identify the fluorescence from each element in the sample.

In an Energy Dispersive instrument, a solid-state detector is used which is capable of discriminating between the energies of the different fluorescent emissions. However, the fluorescence from the lighter elements is relatively low in energy, with relatively small energy differences between adjacent elements, making discrimination and accurate measurement more difficult.

Better limits of detection can be obtained with a Wavelength Dispersive system, using specially designed analysing crystals to spatially separate and isolate the different wavelengths in a manner analogous to the dispersion of light by a prism, and using detectors optimized to the element(s) of interest. A simplified optical layout is shown in Figure1.

The WDXRF spectrometer exhibits better discrimination, or 'resolution' and one specific benefit of this is that it has the ability to use 'internal standards' to compensate for possible interferences. For example the presence of varying amounts of oxygenates or similar compounds in a fuel could interfere with the sulfur measurement. The internal standard (zirconium is used in ISO14596) is chosen to have a fluorescent wavelength very close to the sulfur wavelength and will be affected by the interference in the same way. By adding a known amount of the internal standard to the sample, the magnitude of the interference can be measured and a correction obtained.

Variations on a theme

A number of possible variations on the basic layout are possible. Instruments tend to be classified according to whether they are high- or lowpowered, and whether they are flexible or dedicated to a particular task.

Low and high power usually refer to the generator used to supply the X-ray tube, and range from 200 Watts in an economical QC machine to 4,000 Watts at the top of the range, and voltages up to 60 kiloVolts. Since the success of the whole process depends on the ability to excite the sample in an efficient and reproducible manner, the design and

technology of the X-ray tube and generator is critical. In general, lower (better) detection limits can be achieved with high-power systems.

Flexibility to determine a wide range of elements is normally achieved by using a mechanical device called a goniometer to move the analysing crystal and detector in such a way that the instrument can 'scan' across the different wavelengths emitted by the sample, stopping at each one for a few seconds to take the measurement. Such a system is known as a 'sequential' X-ray spectrometer. The goniometer movement has to be controlled with extreme accuracy and precision if valid results are to be obtained - angular control within 0.0025° and reproducibility better than 0.0001° are achieved in the best instruments. A top-quality, high-power sequential spectrometer can determine virtually every element in the Periodic Table, with detection limits at the parts per million level. Sophisticated instrumentation of this type can be found in the research laborato-

ries of virtually all the major oil companies, and also has a role in production control situations which require the measurement of different many elements, or qualitative analysis -'what is this?' is not an unknown question in the plant laboratory!

The goniometer arrangement described above is not cheap, which is one reason why WDXRF has had the reputaof being tion

prohibitively expensive. An alternative approach is to use separate pre-set analytical 'channels' for each element. Using such a design, economical dedicated systems have been developed, ideal for monitoring the elements covered by current environmental legislation, and costing about the same as a bench-top ICP spectrometer or a highresolution EDXRF machine.

All modern systems are computercontrolled and can be preprogrammed to simplify operation, and further automated by the addition of a sample changer.

Advantages

Many techniques for elemental analysis, like AA and ICP, require that the atoms of the analyte are released from the molecular structure of the sample, for example by dissolution. X-ray fluorescence spectrometry can usually measure them in the original sample. Liquids are simply poured into sample cups and placed in the instrument for direct measurement. Materials like waxes or bitumens can be pressed into pellets. Solids can also be formed into pellets, using a hydraulic press, perhaps after initial grinding (if not in powder form). This simplicity of sample preparation, combined with the inherent stability and repeatability of the measurement, allows relatively unskilled personnel to produce reliable, quality results in a plant situation. Furthermore the prepared sample is not destroyed by the measurement process, and can be retained for future reference.

The initial purchase price of a modern dedicated WDXRF system could be twice that of an AA machine or about the same as a bench-top ICP (although the former cannot detect sulfur at all, the latter only if designed to work in the far ultraviolet region of



Figure 1: Wavelength Dispersive X-ray Spectrometer Optical System

the spectrum). However, in many situations any cost differential can be largely eliminated, or even reversed, by the savings in gases, reagents, and the time of skilled technicians, not to mention the longevity of WDXRF equipment. The absence of hazardous reagents, flammable gases and fume extraction from the installation is another important consideration

The technique of Wavelength Dispersive X-ray Fluorescence is likely to become a preferred method for routine low-level sulfur measurements. Traditionally viewed as the expensive preserve of the large research or central laboratory, its ability to handle many of the other elemental analyses routinely required in the oil industry deserves a reappraisal, particularly with the advent of cost-effective dedicated instrumentation.

Road tankers

Tankers take computing on-board

Fina distributor Butler Fuels has successfully pioneered the adoption of touch-screen personal computers in the cabs of its road tankers, with a central system communicating over a mobile phone network. A couple of years ago such a set-up would not have been technologically possible. The system is said to shorten the cycle between order and delivery and makes it possible for deliveries to be scheduled more efficiently - key factors for distributors as they struggle in an increasingly competitive market, reports Jo Butler.



riginally a family firm founded in the mid-nineteenth century, Butler Fuels is by far the largest distributor for Fina plc, the UK arm of the Belgian oil company, which acquired the haulier in 1988. Most of its distribution business is in the domestic heating market but it is also well-established in the commercial and agricultural sectors and serves some 200 retail sites around England and Wales.

The company runs a fleet of 100 oil distribution vehicles. Transport is its highest cost and it has been looking for cost savings in that area. On-board computing was seen as having the potential to cut costs of deliveries substantially by rationalizing schedules and avoiding tankers travelling empty for long distances. Mobile phones on their own could not cope with the volume and complexity of data involved in such an operation. In a bid to solve the problem, from March to October 1996 the company piloted a new form of computing which it developed in conjunction with Computer Design Systems (CDS) of Salford using technology from US software developer InterSystems.

CDS wrote a new software program called 'The Deliverer' using InterSystems' Open M application development method, which Butler Fuels' computer department then tailored to its own operations. The result of the joint venture is a system that uses Vodafone's GSM digital mobile phone network to process business transactions between the tankers and the central computer system at the Cheltenham head office. It is believed to be the first live system of its kind for an oil distributor in the UK using remote data processing.

Drivers have personal computers (PCs) in their cabs programmed with their itinerary and delivery schedule. At each visit money can be collected, receipts can be printed and customers' signatures recorded as proof of delivery. Further orders can be taken at the same time and transmitted straight to the office. Drivers can also receive new instructions on their schedules while on the road, which has not been possible in the past.

'The system we've put together makes the driver's job much more proactive as well as saving us a lot of money on wasted mileage,' says Butler Fuels' Managing Director John Woof. He expects to get a payback on his investment in the system in around a year. 'But much more important from our point of view,' he said, 'is the radical change in working practices which it is bringing about.

'The drivers have recognized what a great opportunity this is for them to play a bigger part in the business,' he continues.

Since the success of the pilot the company has begun rolling out the system to other drivers. It has chosen to install the systems first in those tankers which cover the most outlying areas where the benefits of more efficient scheduling are likely to be greatest. Introducing the systems without disruption and without upsetting the workforce was the biggest challenge of the whole project.

'Getting the drivers to accept the change was our biggest worry, since most of them had little or no previous experience of computers and some might feel their jobs were threatened,' comments Woof.

Avonmouth driver Nigel Miles, who was an early enthusiast for the concept, volunteered to be the pilot for the system and has since become a roving trainer of other drivers. There are now 20 drivers working with on-board PCs and by the end of 1997 about half of the fleet should have been converted. The rest are expected to take it on during 1998.

'The drivers' resistance is being quickly overcome because Nigel Miles has a lot of credibility and his enthusiasm rubs off on them,' says Woof. 'It is now becoming widely accepted by the drivers as they see it is to their advantage as well as that of the company.'

For the drivers, especially the younger ones who are more receptive to change, the new system could bring the opportunity to turn a job into a career. Already they have moved to individual contracts based on their work performance and have annual appraisals like salaried staff.

The system has been found to be much easier to operate than some people feared, according to George Hunt, contracted Development Manager for Butler Fuels. The PCs were designed so that instructions could be processed by a single touch of a window on the screen instead of using conventional keyboards with which many drivers would be unfamiliar.

The machines are ruggedized PCs supplied by ACS Data of Salford – ordinary notebook or laptop computers would not have stood up to the rough treatment which they often get on the road in tankers.

Hunt says that one of the secrets of the success of the project was the adoption of InterSystems' Open M software: 'We realized that a crucial element in setting up a system of this kind is the amount of expertise available, as it cannot be bought offthe-shelf. Anyone wanting to do this is bound to have to develop a lot of new software in order to be able to integrate the system into the organization.'

The company has much expertise in Open M having used the software since 1980. The software runs on a network of Compaq PCs and servers and has proved to be a powerful and flexible tool for developing a modern computer system, comments Hunt. CDS' earlier Codas product – which has been used in oil distribution systems for a number of years, including Butler Fuels' – was also developed using the Open M method.

'Our business has been constantly changing and Open M has allowed us to keep up with the pace of change,' says Woof. 'We could not have expanded the business in the way that we have without its support. All in all, it has been fundamental to our growth.'



NEWschnology - Offshore Europe

Tackling the Millennium Bug together

Delegates attending Offshore Europe 97's seminar on the issues raised by the so-called 'Millennium Bug' confirmed that urgent action is required to prevent the potential disruption that may result from the century date change which threatens to affect computer applications and the technology upon which they rely (see *Petroleum Review*, September 1997). Many expressed concern at the inadequacy of the measures that they had taken to date.

In his keynote address, Malcolm Brinded, Oil and Technical Services Director, Shell UK Exploration and Production, said that studies within his company had revealed that the problem, if not addressed, would affect many parts of its operations. He also confirmed that there would be a price for 'getting it right'.

'We need to spend money', he said. 'Current estimates in the company are between £15mn and £40mn direct costs, although recent indications are that the final cost may be towards the lower end of the range. There could also be significant indirect costs in deferred production.'

To avoid wasteful duplication he strongly advocated collaboration, as opposed to competition, advising contractors and suppliers to share best practice and to fully test their own compliance. This process could be assisted by 'maximizing the use of industry-wide bodies such as the UK Offshore Operators Association (UKOOA) and the Offshore Contractors Association (OCA),' he commented.

Unattended pipeline flooding system unveiled

Copipe Systems, part of the well and pipeline services company The PSL Group, has developed a remote subsea pigging unit which enables operators to flood and pig pipelines without the need for a diving support vessel (DSV) in full-time attendance.

Once positioned on the seabed, the SPU™ is connected to the pipeline by a remotely operated vehicle (ROV), after which filtration, chemical injection and flowrate and pressure specification needs are controlled automatically. The deployment vessel does not need to remain in attendance during operations. The unit negates the need for expensive pumping spreads, hoses, coiled tubing and other connections from a surface vessel to a pipeline for flooding operations, states the manufacturer.

At a maximum weight of seven

tonnes, the SPU™ can be deployed and recovered by small survey vessels or similar and is said to be ideally suited for shallow, deepwater and diverless operations.

Deployed either as part of the initiation head for a new line or post-lay deployed and connected to the line, the SPU™ uses energy from the hydrostatic head of water entering the pipeline. Control valves on the skid monitor and regulate the flow of water through the system.

The system completed its first two pipeline floods in August 1997 for McDermott Marine Construction and Shell UK Exploration and Production in the northern North Sea.

Tel: +44 (0)1224 783008 Fax: +44 (0)1224 783005



Subsea pigging unit

New observation ROV

A new 'Sea Pup' observation class remotely operated vehicle (ROV) has been launched by Racal TTI to undertake a wide range of light subsea tasks, including jack-up rig and diver support as well as inspection tasks, at depths down to 600 metres. Measuring just 1.1 metre by 750 mm and 850 mm high, the 20 hp ROV is powered by four horizontal and two vertical vectored thrust hydraulic motors which generate a lateral thrust of 75 kg and a vertical thrust of 40 kg. The new unit operates from the same topside system as the company's existing Seal and Sealion ROVs.

The Sea Pup can be equipped with a high-definition CCTV and a range of sensors including those for sonar, flooded member detection, cathodic protection and bathymetry. It can also be equipped with a small two-function hydraulic grabber and hydraulic rope or wire cutter.

Tel: +44 (0)870 601 0000 Fax: +44 (0)181 391 1602 e-mail: publicity@racal-survey.co.uk

Deepnet initiative

The Centre for Marine and Petroleum Technology (CMPT) has set up a new information network collating worldwide knowledge on development technologies for deep water, including projects, initiatives, studies and project proposals. The network, electronic bulletin board and a discussion forum, are accessible through the Internet on www.deepnet.co.uk.

Deepnet is open to oil and gas comcontractors, government panies. departments, research and technology organizations and universities around the world. Members have ready access to field development information and experience on all participating deepwater initiatives and are able to enter details of their own technology needs. Potential technology projects will have a better chance of securing the best partners and significant funds, and research organizations will be able to focus their activities on important issues with market potential, states CMPT. Deepnet will also publicize relevant conferences and seminars.

The joining fee is £1,000 for industry members. To date 19 companies and organizations have become members and a steering group has been set up with members from BP, Marathon, Texaco, Baker-Hughes Inteq, Baroid and Trident Offshore.

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NEWschnology - Offshore Europe

A Wellcom development for marginal field production

A new system for improving hydrocarbon production and recovery from marginal fields was on show for the first time at Offshore Europe 97. Developed by CALtec of Cranfield in the UK, the Wellcom system is claimed to increase recovery from marginal fields by as much as 15% and production rates by up to 40%.

The patented pressure boosting technology combines new ways of separating, pumping and mixing liquids and gases without the need for moving parts. It exploits the energy from highpressure fields to 'drive' low-pressure fields and is particularly suited to locations where wells of different pressures are located close to one another.

A compact unit built into the subsea pipeline separates the mixture of gas and oil produced from a high-pressure field. The high-pressure oil passes through a jet pump, 'sucking' oil/gas out of the low-pressure field. The mixture from the two fields then goes through a mixing unit to recombine it with the gas from the separator. The resulting mixture of oil and gas is then transported down a single pipeline to its destination.

According to the manufacturer, the Wellcom system reduces the cost of exploiting new wells by allowing operators to plug into existing pipelines and platforms without having to waste energy tied up in the high-pressure field by reducing the pressure through a choke valve so that the fluid can join product streams from other producing wells and fields for transportation. It is also claimed to facilitate the opening up of old wells which have stopped flowing or where falling pressure restricts production.

A free initial survey is offered to companies that want to see if Wellcom meets their needs.

Tel: +44 (0)1234 750422 Fax: +44 (0)1234 750074 e-mail: caltec@bhrgroup.demon.co.uk



The Wellcom system was successfully tested at Agip's Trecate field earlier this year

Monitoring subsea chemical injection processes

A low flow rate, seabed-mounted meter allowing the set-up and continuous monitoring of chemical injection processes has been released by Litre Meter of Aylesbury in Buckinghamshire.

Manufactured in stainless steel, the VFF meter series has been developed for use at depths of 1,000 metres plus and with chemical pressures of up to 1,380 bar. It can handle flow rates from as little as 0 to 1 litre/h to 0 to 700 litres/h.

The unit provides an output in the form of a continuous milli-Amp current signal. This is modulated from 4mA to 20mA to represent 0 to 100% of application flow rate on a simple two-wire loop connection capable of transmission for tens of kilometres to parent platforms. Output from a number of meters can also be routed to a multiplexer in a subsea-mounted pod to reduce the cabling requirement back to a remote platform location. Measurements are accurate to ±1% states the manufacturer.

Flow rate information is passed to an ROV which then sets up an accurate flow rate via a mechanical valve in the injection pipework. The flow rate signal can also be used for automatic flow control



valves that may be set by remote operated command signals.

The system is claimed to perform without maintenance for 10 years. Extra security features, such as a standby sensor which is automatically brought into action, are incorporated in the design.

Tel: +44 (0)1296 420341 Fax: +44 (0)1296 436446

Emperor cable cleat unveiled

Ellis Patents of Malton, North Yorkshire is marketing a stainless steel trefoil cleat specifically developed for cable fixing applications in the offshore and onshore oil and gas sector.

The patented Emperor cleat is available in both single-bolt and two-bolt fixing versions. It is light and compact with a wide aperture when opened out for ease of cable fitting.

The framework is manufactured from 316 stainless steel to provide protection from corrosion while the inner liner is made from an LSF polymeric material which not only ensures minimum damage and protection if a short-circuit failure occurs but is also flame retardant and does not give off smoke and fumes in the event of a fire, claims the manufacturer.

The unit can accommodate a wide range of cables – from 24 mm outside diameter (od) to 82 mm od as standard but can be tailored to handle 117 mm od cables for special applications.

Tel: +44 (0)1944 758395 Fax: +44 (0) 1944 758808

NEW Schnology - Offshore Europe

Good vibrations from new torque wrench

A new generation of IZO electronic torque wrenches said to be accurate to $\pm 1\%$ have been developed by Sandvik Saws and Tools.

The new tools allow required torque values, together with a permissible percent tolerance, to be pre-set. The user is guided by four distinct signals – lights, a read-out display, an audible sound and a vibration felt in the hand – as the torque approaches or is within the required band. According to the manufacturer, the Feelback vibration signal allows the tools to be used in noisy conditions and poor light as well as in areas with awk-ward access.

The company expects that operators will quickly learn to rely on Feelback alone, using the other signals only for occasional control.

The IZO-M series of tools has an onboard memory capacity of up to 1,100 torque values plus fastener number, unit of measurement, year, date and time. A recall key gives the user quick access to

Downhole oil/water separation

REDA Production Services' recently developed Aqwanot downhole oil/water separation system is claimed to remove over 90% of produced water while increasing oil and gas production. 'By separating the water downhole, capital costs for lifting, treating and disposal are minimized,' states the manufacturer. 'The environmental liability risk associated with treatment and disposal of large volumes of produced water are also greatly reduced.'

The system features a submersible pump and a hydrocyclone separator to mechanically separate the water from the oil and reinject it in the production well itself.

Tel: +44 (0)1467 622200 Fax: +44 (0)1467 624283



the memory for checking or verifying work in progress.

Tel: +44 (0)121 504 5200 Fax: +44 (0)121 504 5252

Relieving the pressure

Sabre Flow Safe is a new venture formed between the Sabre Group of Altrincham in the UK and Buffalo, New York-based Flow Safe to market a new range of enhanced performance safety relief valves.

Designed by Flow Safe, the range comprises both spring-loaded and pilot-operated ASME-stamped safety relief valves in pressure ratings from 10"WC (water column) up to 10,000 psi and in a wide variety of standard and exotic materials.

The valves are said to offer tighter lift tolerances, lower blowdown and improved mechanical integrity when compared with more conventional safety relief valve designs.

Following the partnership agreement between Sabre Group and Flow Safe, valves for the UK and European market will, in the near future, be assembled and tested at Sabre's Altrincham manufacturing plant.

Tel: +44 (0)161 928 4287 Fax: +44 (0)161 928 5651

Snap-and-lock pipeline connector cuts costs

Materials engineering company Wyman-Gordan has unveiled a new concept in pipeline connection which it claims could save the offshore industry millions of pounds in pipeline laying costs.

Available in sizes ranging from 4 to 36 inches in diameter, the snap-and-lock Thor Connector eliminates the need for offshore welding and reduces the time required for installing subsea pipelines – a laborious process which costs operators hundreds of thousands of pounds per day.

The connector's mechanical design also means that pressure integrity testing, which normally has to be carried out offshore, can be done onshore prior to installation, reducing costs yet further, states the manufacturer.

Tel: +44 (0)1506 446200 Fax: +44 (0)1506 446330

Ultrasonic multipath flow measurement

Daniel has developed a new five-path ultrasonic liquid flow meter for custody transfer. The QuintaSonic meter range is said to be capable of measuring the flow rates of any ultrasonically conductive liquid in Ex Zone 1 areas. The unit has been designed to operate with liquid densities between 490 and 1,200 kg/m³, viscosities from 0.1 cSt to more than 125 cSt, flow velocities from 0.5 to 10 metres/second and a temperature range of -60°C up to 140°C.

It can calculate volumetric and mass

flow rates and provide other information including viscosity, Reynolds number, temperature and liquid sonic velocity.

As nothing intrudes into the flow path, negligible pressure loss is introduced into the pipeline, states the manufacturer, while the absence of moving parts greatly reduces the need for maintenance and recalibration.

Tel: +44 (0)1653 695551 Fax: +44 (0)1653 600425





NEWischnology

Diverless first for flanged subsea assembly reconnection

Sonsub International, together with McDermott Subsea Contractors and British Petroleum, have developed a remote connection system for subsea flange pipelines. Developed specifically for use on the BP-operated Foinaven field, west of Shetland, the device was recently used to disconnect and reinstall two flowline termination assemblies (FTAs) to 8-inch and 10-inch rigid flowlines on the field. According to the three companies, the operation represented the first ever diverless reconnection of a standard flanged subsea assembly.

The connections to the FTAs were originally done onboard the pipelay vessel prior to installation in water depths of more than 450 metres, too deep for divers. Without the new tooling device, expensive mechanical pipe connectors would have had to have been used or the pipeline ends recovered and brought to the surface for reconnection.

The operation on the Foinaven field was carried out from the *MSV lolair* using Sonsub's work class ROVs *MRV 01* and *MRV 06*. The tooling comprises an alignment frame capable of handling structures up to 20 tonnes in weight, such as the FTAs, small manifolds and pig launchers and receivers. The alignment skid positions the FTA next to the rigid flowline flange and as both flanges were weld neck (not swivel) in this case,



Pipeline alignment skid with flowline termination assembly and pipeline

the skid also rotated the FTA to allow the bolt holes to be aligned. Once aligned, the ROV used its manipulator to deploy the bolt magazine which allowed all studs and nuts to be held in the correct position prior to tightening by a twin torque tool. Both external and internal pressure tests were carried out before the FTA was replaced on to the seabed and all equipment recovered onboard the vessel.

BP owns the system, but all three companies have retained design rights for the flange pipeline remote connection system.

Sonsub International Tel: +44 (0)1224 843434 Fax: +44 (0)1224 843435

Non-contact valve positioner

Keystone Flow Control of Glasgow, Scotland, has extended its range of valve positioners with the K-Block magnetically-operated, quarter-turn position indicator. To prevent moisture ingress, the K-Block is housed in a durable resin and polyurethane potting enclosure which ensures resistance to corrosive services such as aromatic hydrocarbons, oils, fats and fuels.

The unit comprises a sealed sensor with two inductive proximity switches and an indicator with two metallic screws located 90 degrees apart. As the valve position changes the sensor detects one or the other of the screws providing valve open and valve closed output signals.

The non-contact design of the K-block means that there are no mechanical components to wear or spark, minimizing both maintenance requirements and the potential of false signals, reports the company.

Tel: +44 (0)141 810 3121 Fax: +44 (0)141 810 4724

Three-in-one gas analyser

The new TMO2-TC gas analyser from Panametrics measures the concentration of hydrogen, carbon dioxide,



methane, helium and other gases in binary and pseudo-binary gas mixtures by measuring the thermal conductivity of the sample gas and comparing it to the thermal conductivity of a reference. The unit is contaminant resistant and insensitive to flow variation, vibration and shock, states the manufacturer. It is particularly suited for use with large power station alternators where hydrogen coolant gas purity is essential for operational safety.

Tel: +44 (0)181 643 5150 Fax: +44 (0)181 643 4225

If you would like your new product releases to be considered for our Technology News pages, please send the relevant information and pictures to: Kim Jackson Deputy Editor, Petroleum Review 61 New Cavendish Street, London W1M 8AR, UK



Transportation & Trading in the UK & European Gas Markets

Elise Hinxman and Edwin Bailey (SMi (Publishing) Ltd, No 1, New Concordia Wharf, Mill Street, London SE1 2BB, UK). ISBN 1 8620 600 2. 108 pages. Price: £395.

This report provides a comprehensive analysis of the developing European gas industry which is currently in a state of flux as the market liberalizes and becomes more integrated. Designed to help the reader assess the risks of transporting and trading gas at an international level, it contains information on new pipelines and infrastructure developments across western Europe, the implications of European Union energy directives on gas transportation, data on new market entrants, market profiles of 13 western Europe countries and company profiles of eight of the major players together with a number of maps, charts and graphs.

Vehicle and Fuel Challenges Beyond 2000: Market Impacts of the EU's Auto Oil Programme

Stephen Peake (FT Automotive Publishing, Maple House, 149 Tottenham Court Road, London W1P 9LL, UK). ISBN 1 85334 644 6. 199 pages. Price: £395 (paperback).

Meeting Auto Oil requirements will involve continuous improvement and innovation across the range of engine emission control systems, from mixture preparation to after-treatments. This report uses case studies of key players to analyse both light and heavy duty vehicle emission control technologies as well as the various strategies of core vehicle manufacturers and component suppliers. Sources and ingredients for further long-term regulatory driven change towards clean vehicle technology are also discussed including analysis of developments in the European Programme on Emissions, Fuels and Engine Technology (EPEFE) and fuel quality issues, international comparisons of vehicle emission regulation and prospects for harmonization and the outlook concerning government interventions to reduce carbon dioxide emissions from vehicles by improving fuel economy.

Energy Finance to 2010 – Risks and Opportunities for the Industry and Investors

Sameer Nawaz (FT Energy Publishing, Maple House, 149 Tottenham Court Road, London W1P 9LL, UK). ISBN 1 85334 755 2. 155 pages. Price: £350 (paperback).

This report provides a complete overview of energy finance, including sector-by-sector and region-by-region forecasts of energy finance requirements, a discussion of key issues likely to affect future energy finance requirements and details of privatizations and comparisons between privatized and state-owned companies. Case studies of some of the world's leading energy companies and their investment strategies are also covered.

Abstracts in New Technologies and Engineering (ANTE)

(Bowker-Saur, Maypole House, Maypole Road, East Grinstead, West Sussex RG19 1HU, UK). ISSN 1367-9899. 182 pages. Price (annual subscription; paperback): £735 EC; \$1,365 US; £795 rest of world.

ANTE is the revised and re-launched version of the abstracting and indexing title. *Current Technology Index*. Coverage has been expanded to include new technologies and engineering and the format changed to improve ease of use. The new title has also increased the range of source titles to include national UK newspapers as well as key journals covering the new technologies. On-line access is also available.

The Energy Report – Oil and Gas Resources of the United Kingdom 1997 Volume 2

(The Stationery Office, The Publications Centre, PO Box 276, London SW8 5DT, UK). ISBN 0 11 515429 9. 196 pages. Price: £45 (paperback).

Volume 2 of the UK Department of Trade and Industry's annual Energy Report (widely referred to as the 'Brown Book') provides a wealth of information on the UK's oil and gas reserves. It covers the ways that the DTI is working with partnership with the industry, the licensing and fiscal regimes governing it, production levels and remaining hydrocarbons reserves as well as statistics on the industry as a whole and by field, both onshore and offshore. A full colour map section is also included.

Guidance for Measures to Cope with Degraded Marine Heavy Fuels

(Nippon Kaiji Kyokai, 4–7 Kioi Cho, Chiyoda-Ku, Tokyo 102, Japan; or, Class NK, Finsbury Circus House, 12–18 Finsbury Circus, London EC2M 7EB, UK). 142 pages. Price: No charge (paperback).

This publication provides new guidelines to help shipowners and other interested parties to address the problem of serious machinery damage to marine diesel engines caused by the use of poor-quality heavy fuel oils. It reviews diesel engine failures and detrimental elements in fuel oil, outlines problems relating to bunker supplies, shipboard storage and the processing of heavy fuel oil and suggests measures to counter these problems.

Preparing for Competition in the European Gas Markets

(MarketLine International, 16 Connaught Street, London W2 2AF, UK). 200 pages. Price: \$1,495 (paperback).

This report gives a strategic overview of the European gas market and analyses the latest developments at the national level in 25 countries. Published to coincide with the EU directive on gas deregulation, it addresses all the key issues facing the market including the industry's readiness for competition, new opportunities and likely casualties in a deregulated market. Some 25 companies are also profiled and their prospects in a liberalized market discussed.

Preparing for Competition in the European Electricity Markets

(MarketLine International, 16 Connaught Street, London W2 2AF, UK). 250 pages. Price: \$1,450 (paperback).

This study covers all aspects of the European electricity business. It evaluates the potential offered by a deregulated market, highlights threats as well as opportunities and pinpoints the winners and losers as competition takes hold. Some 23 countries and 25 companies are profiled.

Handbook of Diagnostic Procedures for Petroleum-Contaminated Sites

Editors: Paul Lecomte and Claudio Mariotti (John Wiley & Sons Ltd, Baffins Lane, Chichester, West Sussex PO19 1UD, UK). ISBN 0 471 97108 1. 192 pages. Price: £45.

This handbook is a practical guide for the methods and procedures required in assessing the nature, degree and related risk of hydrocarbon pollution in contaminated sites. It is the result of the four-year RESCOPP (The REmediation of Soils COntaminated by Petrochemical Products) R&D programme initiated by the European Union and focuses on the current techniques available for investigating and remediating oil-contaminated sites within a European context.

NE *Wications*

Offshore Oil & Gas Directory 1997/98

(Miller Freeman Information Services, Riverbank House, Angel Lane, Tonbridge, Kent TN9 1SE, UK). ISBN 0 86382 353 X. 1,508 pages. Price: £89 (paperback).

Now in its 25th edition, this directory provides detailed data on over 9,500 suppliers of almost 3,000 different products and services. It covers companies involved in all aspects of exploration, production, drilling, offshore engineering, fabrication and project management as well as manufacturers, suppliers and contractors. The directory also includes an alphabetical listing of over 17,000 key industry executives as well as contacts for associations, conferences, exhibitions and courses.

Oil in Asia – Markets, Trading, Refining & Deregulation

Paul Horsnell (Oxford Institute for Energy Studies, 57 Woodstock Road, Oxford OX2 6FA, UK). ISBN 0 19 730018 9. 423 pages. Price: £39.50.

Asia is the world's largest oil importing region with demand continuing to grow at a rapid pace. This book explains how the oil industry in Asia has evolved and is adapting to both the economic boom and to the widespread redefinition of the role of the state. All aspects of the industry, from production to refining and from trading to deregulation are considered. Two separate chapters focus on China and Japan, the two largest oil consumers in the region, while a further chapter covers developments in India, Korea, the Philippines, Thailand and Taiwan. The book also focuses on the central role of Singapore in the oil markets of the region and looks at this oil centre's earliest beginnings and the complexities of modern day oil trading of informal and futures markets. The impact of Asia on the global crude oil market is also addressed.

Project Management – Orientation for Decision Makers

John Dingle (Bookpoint Ltd, 39 Milton Park, Abingdon, Oxon OX14 4TD, UK). ISBN 0 340 67770 8. 479 pages. Price: £19.99 (paperback).

This publication examines the key factors in the decision-making process, over and above the practical management, that influence the success or failure of any project. The first few chapters deal with projects in the context of business risk before moving on to a discussion of investment and the management of risk through financial and contractual arrangements. Project management techniques are also covered, with the focus on attitudes to management and project 'culture' which, when appropriately chosen and diligently applied, are central to effective project leadership.

The Impact of an Oil Spill in Turbulent Waters: The *Braer*

Editors: J M Davies and G Topping (Microinfo Ltd, PO Box 3, Omega Park, Alton, Hampshire GU34 2PG, UK or The Stationery Office bookshops). ISBN 0 11 495798 3. 263 pages. Price: £80 plus postage and packing and VAT (paperback).

This book explores the environmental impact of the *Braer* tanker oil spill which followed the vessel running aground under severe storm conditions on Garths Ness off the coast of South Shetland on 5 January 1993. Based upon a Royal Society of Edinburgh symposium held on 7–8 September 1995, the book provides an overview of the incident, including the response action taken to deal with the 84,700 tonnes of light Gulfaks crude that escaped from the vessel's ruptured cargo tanks, and assesses the impact of the spill on both the land and sea environments with sections focusing on specific flora and fauna. It also looks at the environmental health implications of the spill.

Code of Safe Practice for Contractors Working on Filling Stations

by R R Thompson - Rutland Scott Group

For some time there has been concern amongst the major retailers about consistency of safety performance of contractors working on petrol filling stations, both live sites and sites being redeveloped. The major retailers mostly draw from the same pool of contractor resource for work on service stations, but use different standards and procedures for their works and this has caused confusion amongst contractors and their workforces. There is concern that this confusion leads to erosion of health and safety standards and the increased likelihood of serious accidents.

In addition the recent restructuring and demanning of the retail business has led to the loss of much experience leaving less time for the safety issues which are confronted every day during maintenance and construction.

The Retail Panel of the Downstream Operations Committee noted the concerns being expressed and commissioned the production of a code of practice that the major retailers would accept as common minimum standards to be adopted when employing contractors, thus helping to remove some of the confusion for contractors and their employees.

The aim of the Code is to provide:

- procedures that can be used on all sites so there is a consistent approach to common items of work;
- a work control system under which contractors become selfcertifying with suitably trained competent personnel performing the role of verifying and issuing authority;
- model documentation for controlling health and safety aspects of works.

Whilst this Code of Practice has been accepted by the industry the Health and Safety Executive initially had concerns about self certification by contractors. However, they have indicated their support for the work control procedures provided industry adopts an approval process to ensure that the contractors employed meet common agreed standards on health and safety issues and have an understanding of their responsibilities under current legislation.

This approval process has already been started by some oil companies using a common basic approach. Whilst the IP has produced model procedures, it is a matter for individual operators to adapt and implement them for their own purposes. IP will not be involved in the contractor approval process, nor will it keep lists of approved contractors.

It is expected that the production of this Code of Practice will lead to :

- reduction in the uncertainty and variation of performance by contractors working on service stations;
- increased capability of owners and operators of service stations to demonstrate to regulatory authorities that they are meeting their obligations under health and safety legislation;
- improved health and safety performance of contractors working on service stations;
- provision of a more consistent basis for measuring the health and safety performance of individual contractors and their personnel;
- increased awareness of health and safety issues amongst service station operators;
- improved contractor efficiency.

All parties involved with work on service stations are urged to adopt the recommendations of this Code with a view to establishing standard practices across the retail sector and improving health and safety performance.

ISBN 0 85293 194 8

Available from the IP Library at a cost of £40. For more details on ordering this publication please see p486

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 thcoming

October

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SPE 72nd Annual Technical Conference and Exhibition Details: Registrar, Society of Petroleum Engineers, PO Box 833836, Richardson, TX 75083-3836, US. Tel: +1 972 952 9393 Fax: +1 972 952 9328

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Amsterdam Adapting to a Competitive Global **Utility Environment** Details: AM/FM International, 14456 East Evans Avenue, Aurora, Colorado 80014, US. Tel: +1 303 337 0513 Fax: +1 303 337 1001 e-mail: amfmintl@aol.com

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Petroleum Trading and Cargo Shortages Details: Abacus International, 214 Inchbonnie Road, South Woodham Ferrers, Essex CM3 5WU, UK. Tel: +44 (0)1245 328340 Fax: +44 (0)1245 323429

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Nicosia Middle East Strategy to the Year 2010 Details: APS Europe, PO Box 2501, London W5 2LR, UK. Fax: +44 (0)181 566 7674

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Caspian Oil & Gas Projects Details: IBC UK Conferences Ltd, Gilmoora House, 57-61 Mortimer Street, London W1N 8JX, UK. Tel: +44 (0)171 637 4383 Fax: +44 (0)171 631 3214

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Bahrain

Vienna

London

1st GCC - EU Conference on Advanced Oil and Gas Technologies **Details: Gulf Co-operation Council** General Secretariat, Oil & Gas Department, PO Box 7153, Riyadh 11462, Saudi Arabia. Tel: +966 1 4880429 Fax: +966 1 4827716

14-15

Trading and Transportation of Oil and Gas in the CIS and the Baltic States **Details: Business Seminars** International Ltd, Sussex House, High Street, Battle, East Sussex TN33 OAL, UK. Tel: +44 (0)171 490 3774 Fax: +44 (0)1424 773334 e-mail: 100451.3120@compuserve.com

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Texas

Singapore

London

London Tanker Event Conference Details: Ms Jane Markussen, INTERTANKO, Oslo. Tel: +47 22 12 26 52 Fax: +47 22 12 26 41

15-17

Africa Upstream '97 Details: Global Pacific & Partners Pty Ltd, 147 Hendrik Verwoerd Drive, Randburg 2194, Johannesburg, South Africa. Tel: +27 11 781 3358 Fax: +27 11 781 3362 e-mail: global.pacific.@pixie.co.za

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London Designing for Health, Safety and the Environment Details: Ms Barbara Williams, M W Kellogg Ltd, Greenford Road, Greenford, Middlesex UB6 OJA, UK. Tel: +44 (0)181 872 7000 Fax: +44 (0)181 872 7272

20-21

Production Sharing Contracts and International Petroleum Fiscal Systems (PSC '97) **Details: Conference Connection** Administrators Pte Ltd, 15a Goldhill Centre, Thomson Road, Singapore 307606. Tel: +65 356 0960 Fax: +65 356 0962 e-mail: cconnect@pacific.net.sg

20-21

20-22

21

Aberdeen Controlling Hydrates, Waxes and Asphaltenes Details: The Bookings Department, IBC UK Conferences Ltd, 57-61 Mortimer Street, London W1N 8JX, UK. Tel: +44 (0)171 453 2712 Fax: +44 (0)171 631 3214 e-mail: caroline.murgatroyd@ibcuk.co.uk

Cape Town

Southern & Central Africa Downstream Details: Global Pacific & Partners Pty Ltd, 147 Hendrik Verwoerd Drive, Randburg 2194, Johannesburg, South Africa. Tel: +27 11 781 3358 Fax: +27 11 781 3362 e-mail: global.pacific.@pixie.co.za

Aberdeen

4th Atlantic Margin Conference Details: Jane Oliver, Offshore Management Centre, Kepplestone Mansion, Viewfield Road, Aberdeen AB15 7AW, UK. Tel: +44 (0)1224 263101 Fax: +44 (0)1224 263100

21-22

Expro Software '97 Details: Conference/Exhibition Administration, Expro Software '97. Geomedia Ltd, Europower House, Lower Road, Cookham, Berks SL6 9EH, UK. Tel: +44 (0)1628 527771

Cape Town

Dubai

Fax: +44 (0)1628 521928 21-23 **Uxbridge**, UK The Fundamentals of Upstream

Energy Politics Details: Petroleum Economist, Baird House, 15-17 St Cross Street, London EC1N 8UN, UK. Tel: +44 (0)171 831 5588 Fax: +44 (0)171 831 4567/5313

22-23

Aberdeen

London

FPSO World Congress & Exhibition Details: Jim Morgan, The Innovation Centre, Aberdeen Offshore Technology Park, Exploration Drive, Bridge of Don, Aberdeen AB23 8GX, UK. Tel: +44 (0)1224 708088 Fax: +44 (0)1224 708080

22-24

London

The E&P Business Game Details: MD Consultancy (UK) Ltd, 18a Carden Place, Aberdeen AB10 1UQ, UK. Tel: +44 (0)1224 626268 Fax: +44 (0)1224 626950 e-mail: 106334.2720@compuserve.com

24-25 PSC'97

India

Details: see 20-21 October, Dubai

27-28

Stavanger Marginal Oil and Gas Fields Details: IBC UK Conferences Ltd, Gilmoora House, 57-61 Mortimer Street, London W1N 8JX, UK. Tel: +44 (0)171 637 4383 Fax: +44 (0)171 453 2058

27-28

28

Aberdeen

Environmental Management Implementation in the Oil & Gas Industry Details: MD Consultancy (UK) Ltd, 18a Carden Place, Aberdeen AB10 1UQ, UK. Tel: +44 (0)1224 626268 Fax: +44 (0)1224 626950 e-mail: 106334.2720@compuserve.com

London

First ACTIVE Conference Details: ACTIVE Secretariat, c/o Mobil Court, 3 Clements Inn, London WC2A 2EB, UK. Tel: +44 (0)171 412 4447 Fax: +44 (0)171 412 4443 e-mail: active@mc-lon.mobil.com

EVENT Synthesing

29-30

Aberdeen Project 2000 in Oil and Gas: Auditing, Testing and Correcting Systems for the Millennium Bug Details: IQPC Ltd, 1st Floor, West Wing, Chancery House, 53-64 Chancery Lane, London WC2A 1QU, UK. Tel: +44 (0)171 691 9191 Fax: +44 (0)171 691 9192

30

London

Sub-Basalt Imaging Workshop Details: Jane Kennedy, CMPT, **Exploration House, Exploration** Drive, Offshore Technology Park, Aberdeen AB23 8GX, UK. Tel: +44 (0)1224 853440 Fax: +44 (0)1224 706601 e-mail: j.kennedy@cmpt.co.uk

30

Coventry, UK

London

London

Surrey, UK

Industrial Distillation Forum -Energy Efficiency for Existing Columns and Alternative Techniques Details: ETSU. Harwell, Didcot, Oxon, OX11 ORA, UK. Tel: +44 (0)1235 433525 Fax: +44 (0)1235 433737

30-31

Joining & Welding for the Oil & Gas Industry

Details: IBC UK Conferences Ltd. Gilmoora House, 57-61 Mortimer Street, London W1N 8JX, UK. Tel: +44 (0)171 637 4383 Fax: +44 (0)171 453 2058 e-mail: angela.broadhead@ibcuk.co.uk

30-31

Sakhalin Oil & Gas Details: IBC UK Conferences Ltd, Gilmoora House, 57-61 Mortimer Street, London W1N 8JX, UK. Tel: +44 (0)171 637 4383 Fax: +44 (0)171 631 3214

31–3 November

Understanding the Fundamentals of the Oil Industry Details: Petroleum Economist, PO Box 105, Baird House, 15-17 Cross Street, London EC1N 8UN, UK. Tel: +44 (0)171 831 5588 Fax: +44 (0)171 831 5313

November

2-7

Dallas

Society of Exploration Geophysiscists, International Exposition and 67th Annual Meeting Details: SEG/Dallas '97, PO Box

702740, Tulsa, OK 74170-2740 Fax: +918 497 5557 URL:www.seg.org/register/.

Aberdeen

Bulk Liquid Measurement Details: Abacus International, 214 Inchbonnie Road, South Woodham Ferrers, Essex CM3 5WU, UK. Tel: +44 (0)1245 328340 Fax: +44 (0)1245 323429

Bali, Indonesia

3-4 Surplus or Shortage: Condensate for the Asia-Pacific **Details: Conference Connection** Administrators Inc, 151a Goldhill Centre, Thomson Road, Singapore 307606. Tel: +65 356 0960 Fax: +65 356 0962 e-mail: cconnect@pacific.net.sq

Barcelona 12th Annual European Autumn Gas Conference: Coping with Supply Details: Overview Gas Conferences, 82 Rivington Street, London EC2A 3AY, UK. Tel: +44 (0)171 613 0087 Fax: +44 (0)171 613 0094

4-6

Profit Solutions '97 Details: KBC Process Technology Ltd, KBC House, Churchfield Road, Weybridge, Surrey KT13 8DB, UK. Tel: +44 (0)1932 856622 Fax: +44 (0)1932 854551

5-7

London

London

London

Environmental Management Implementation in the Oil & Gas Industry Details: See entry for 27-28 October

5-7

The Changing Economic Geography of the Gulf: Implications for Trade and Investment Details: The Conference Unit, The Royal Institute of International Affairs, Chatham House, 10 St James' Square, London SW1Y 4LE, UK. Tel: +44 (0)171 957 5700 Fax: +44 (0)171 321 2045

6 November London: IFEG Conference:

Re-engineering the Energy Information Service Details: Pauline Ashby, The Institute of Petroleum.

6-7 **Billingham**, UK Helicopter Escape Seminar & Workshop Details: Mills Advertising and Publicity, Manchester House, 48 High

Street, Stokesley, N. Yorkshire TS9 5AX, UK. Tel: +44 (0)1642 566656 Fax: +44 (0)1642 713174

6-7

London Doing Business in Uzbekistan Details: IBC Financial Focus, 57-61 Mortimer Street, London W1N 8JX, UK. Tel: +44 (0)171 453 2703 Fax: +44 (0)171 323 4298 e-mail: sarah.ritchie@ibcuk.co.uk

Hertfordshire, UK

7-9 The Fundamentals of Pipeline Planning, Financing and Operation Details: Emma Jackets, Petroleum Economist, Baird House, 15-17 St Cross Street, London EC1N 8UN, UK. Tel: +44 (0)171 831 5588 Fax: +44 (0)171 831 4567/5313

10-11

Birmingham, UK 17th APEA Conference and Exhibition Details: Barbara Jacketts, APEA, PO Box 2, Hadleigh, Suffolk IP7 5SF, UK. Tel: +44 (0)1473 828539 Fax: +44 (0)1473 828 538

10-11

Rome Global Gas '97 Details: Global Pacific & Partners Pty Ltd, 147 Hendrik Verwoerd Drive, Randburg 2194, Johannesburg, South Africa. Tel: +27 11 781 3358 Fax: +27 11 781 3362 e-mail: global.pacific.@pixie.co.za

11

Tokyo Petrochemical Industry: Outlook for Growth and Profitability Details: Chem Systems Inc, 303 South Broadway, Tarrytown, NY 10591-5487, USA Tel: +914 631 2828 Fax: +914 631 8851

11-12

London

9th Annual FT Petrochemical Industry Conference Details: Sarah Gibb, FT Conferences Tel: +44 (0)171 896 2639 Fax: +44 (0)171 896 2696 e-mail: sarahg@pearson-pro.com

15-19 **Abu Dhabi**

Environmental Management Implementation in the Oil & Gas Industry Details: See entry for 27-29 October

17-18 Hong Kong GasTrade '97 Details: GasTrade Secretariat, Turret RAI plc, Armstrong House, 38 Market

PETROLEUM REVIEW OCTOBER 1997

EVENTS
 thcoming

Square, Uxbridge, Middlesex UB8 1TG, UK. Tel: +44 (0)1895 454533 Fax: +44 (0)1895 454578

18 November

London: The World's your **Oyster: New Opportunities for Upstream Oil & Gas Details: Pauline Ashby, The** Institute of Petroleum.

18-19

London

Seattle

New Orleans

Vienna

Oil and Gas Agreements Details: Langham Oil Conferences, 37 Main Street, Queniborough, Leicester LE7 3DB, UK. Tel: +44 (0)1509 881022 Fax: +44 (0)1509 881576 e-mail: enquiries@langham.co.uk

18-20

Singapore 2nd World Tanker Outlook **Details: Conference Connection** Administrators, 151a Goldhill Centre, Thomson Road, Singapore 307606. Tel: +65 356 0960 Fax: +65 356 0962

e-mail: cconnect@pacific.net.sg

18-20

Marine Fuels: Specifications, Testing, Purchase and Use Details: Kristina Falkenstein, ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, US. Tel: +1610 832 9686 Fax: +1 610 832 9635 e-mail: service@astm.org

19-21 Bogota, Columbia Expo Petroleo '97

Details: Birmingham Chamber of Commerce and Industry, Overseas Fairs Division, George House, George Road, Birmingham B15 1PG, UK. Tel: +44 (0)121 455 9600 Fax: +44 (0)121 456 1785

19-21

Marine Fuels: Specifications, Testing, Purchase and Use Details: See entry for 18-20 Nov, Seattle

20-21

London Natural Gas: Trade and Investment Opportunities in Russia and the CIS Details: The Royal Institute of International Affairs, Chatham House, 10 St James's Square, London SW1Y 4LE, UK. Tel: +44 (0)171 957 5700 Fax: +44 (0)171 957 5710

24-25

Transmission and Distribution of Gas in the Emerging Markets of Central

and Eastern Europe Details: IBC Financial Focus, 57-61 Mortimer Street, London W1N 8JX, UK. Tel: +44 (0)171 453 2703 Fax: +44 (0)171 323 4298 e-mail: rebecca.luing@ibcuk.co.uk

24-25

London Financing Petrochemicals Projects in the Middle East Details: IBC Financial Focus, 57-61 Mortimer Street, London W1N 8JX, UK. Tel: +44 (0)171 453 2753 Fax: +44 (0)171 453 2703 e-mail: joanne.chapman@ibcuk.co.uk

24-28 **Kuala Lumpur** Environmental Management Implementation in the Oil & Gas Industry Details: See entry for 27-29 October

25 - 27Aberdeen Offshore Drilling Technology Details: IBC UK Conferences Ltd, 57-61 Mortimer Street, London W1N 8JX, UK. Tel: +44 (0)171 453 2750 Fax: +44 (0)171 453 2058 e-mail: sonia.klaege@ibcuk.co.uk

27 November London: Competitiveness Through Innovation: The 3rd IP International Downstream **Logistics Conference Details: Pauline Ashby, The** Institute of Petroleum.

December

2-3 London The Refining Industry in the CIS **Details: Busines Seminars International** Ltd, Sussex House, High Street, Battle, East Sussex TN33 OAL, UK. Tel: +44 (0)171 490 3774 Fax: +44 (0)1424 773334 e-mail: 100451.3120@compuserve.com

2-4

MariChem '97 Details: MariChem Secretariat, Turret RAI plc. Armstrong House, 38 Market Square, Uxbridge, Middlesex UB8 1TG, UK. Tel: +44 (0)1895 454545 Fax: +44 (0)1895 454647

e-mail: 100730.1313@compuserve.com

4-5 London Floating Production Systems Details: IBC UK Conferences Ltd, Gilmoora House, 57-61 Mortimer Street, London W1N 8JX, UK.

Tel: +44 (0)171 637 4383 Fax: +44 (0)171 4453 2712 e-mail: sonia.klaege@ibcuk.co.uk

London

Management of Fire and Explosions Details: Anne Lomax, Institution of Mechanical Engineers, 1 Birdcage Walk, London SW1H 9JJ, UK. Tel: +44 (0)171 973 1261 Fax: +44 (0)171 222 9881 e-mail: a_lomax@imeche.org.uk

Coventry, UK

The International Energy Experience: Markets, Regulation and Environment Details: Mary Scanlan, BIEE, 37 Woodville Gardens, Ealing, London W5 2LL, UK. Tel: +44 (0)181 997 3707 Fax: +44 (0)181 566 7674

8-12

8-9

8-9

Environmental Management Implementation in the Oil & Gas Industry Details: See entry for 27-29 October

London 10-11

Subsea '97 Details: Knighton Enterprises Ltd, 2 Marlborough Street, Faringdon, Oxon SN7 7JP, UK. Tel: +44 (0)1367 242525 Fax: +44 (0)1367 241125 e-mail: sen@btinternet.com

15-16

London

Caracas

2nd World Annual Baseoils Conference 1997 Details: ICIS-LOR, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS, UK. Tel: +44 (0)181 652 3535 Fax: +44 (0)181 652 3929 e-mail: sales.uk@icislor.com

18-19

Cologne

Austria The Russian Refining Roundtable Details: World Refining Association. Tel: +44 (0)1242 529090 Fax: +44 (0)1242 529060

January

18-20

Perth Australasian Energy Pacesetters '98 **Details: Global Pacific & Partners Pty** Ltd, 147 Hendrik Verwoerd Drive, Randburg 2194, Johannesburg, South Africa. Tel: +27 11 781 3358 Fax: +27 11 781 3362 e-mail: global.pacific.@pixie.co.za

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UK oil and gas revenues fall

Seasonal maintenance and delays in commissioning some fields as others reached the end of their lives led to a decline in both oil and gas production in June 1997, according to the *Royal Bank of Scotland Oil and Gas Index* in July. As a result, combined production was at its lowest level since August 1996. Daily average oil and gas revenues fell 12.6% to a provisional £34.9mn, the lowest since August 1995, compared with the recent high of £60.1mn in January this year.

The average price of Brent crude fell 8.1% during June to \$17.70, a drop of some 4% on an annual basis. The strength of the pound meant the sterling price of Brent crude fell 8.7% during the month, some 10% year-on-year.

'Prices are expected to remain at recent levels in the short run,' said the Royal Bank of Scotland. However, 'if prices do move out of their current range, they are most likely to fall. Although demand is buoyant, supply is also growing strongly and stocks are strong.'

Did you know that the IP web site http://www.petroleum.co.uk/petroleum/ provides • A News in Brief Service

- Full details of IP publications and conferences
- Hot links to 60 other oil and gas industry sites
- Key data such as names and addresses of all the leading oil and gas companies operating in the UK
- Details of IP Week events
- Full publications catalogue
- Oil & Gas Energy for the World a guide for school and college students
- What's On at the IP and Around the Branches
- Over 120 pages of data and information about the IP and industry activities

The IP web site - the first step in any data search

http://www.petroleum.co.uk/petroleum/

UK Deliveries into Consumption (tonnes)

	and the second				
Products	†Jul 1996	*Jul 1997	tJan-Jul 1996	*Jan-Jul 1997	% Change
Naphtha/LDF	203,310	157,234	1,669,265	1,064,155	-36
AIF – Kerosene	780,952	796,075	4,547,208	4,736,110	4
Petrol	1,957,411	1,926,170	12,828,171	13 022 607	2
of which unleaded	1,312,765	1,392,460	8 604 692	9 215 913	27
of which Super unleaded	57,109	42 355	443 073	313 346	20
Premium unleaded	1,255,656	1,350,105	8 161 619	8 902 567	-29
Burning Oil	147,138	152 332	1 944 306	1 004 720	9
Derv Fuel	1 254 753	1 234 902	9 255 226	9,661,061	-2
Gas/Diesel Oil	561 963	551 513	4 542 120	6,001,001	5
Fuel Oil	483 368	216 761	4,545,120	4,295,555	-5
Lubricating Oil	405,500	210,701	4,046,664	2,544,854	-37
	70,909	72,830	510,292	514,889	1
Other Products	772,766	771,631	5,092,405	4,965,371	-2
Total above	6,238,630	5,879,448	43,436,757	41,709,332	-4
Refinery Consumption	EEE 000	FC1 452	2010.152		
themilely consumption	555,696	501,452	3,810,162	3,757,198	-1
Total all products	6,794,528	6,440,900	47,246,919	45,466,530	-4
† Revised with adjustments * oreliminary					

New IP Publications

Access to the Top of Road Tankers

The Approved Code of Practice and Guidance associated with The Workplace (Health, Safety and Welfare) Regulations 1992 advises that effective measures, such as the provision of fencing, should be taken to prevent falls whenever people regularly go on top of road tankers. This has important implications for the oil industry tanker fleet, where ascents on to tankers away from loading racks are routinely made without safety rails.

An Oil Industry Working Group was formed to review the history of such accidents, evaluate measures already in place, identify any improvements and assess whether the fitting of handrails to tankers could be justified as an effective measure.

This publication describes the results of the study. It identifies the areas of risk for road tankers and recommends good, safe practices that should be adopted to reduce the risk of falls. It is concluded that the fitting of handrails to the tops of oil industry tankers does not offer a reliable and practicable solution for the avoidance of falls during ascents.

ISBN 0 85293 192 6

Available for sale from the IP Library, at a cost of £24.00 inc. postage in UK and Europe (outside Europe add £5.00).

A Sector Application Guide for ISO 14001: for the Marketing and Distribution of Petroleum Products

This document outlines the elements of a Sector Application Guide (SAG) for those involved in marketing and distribution of petroleum products implementing the International Standards Organization's ISO 14001: 1996 Environmental Management Systems – Specification with Guidance for Use.

ISO 14001 requires that organizations develop and maintain a procedure to identify the environmental aspects of the business in order to determine those which have or can have significant impacts on the environment and this document provides a suitable methodology for assisting with this process.

The document will be useful to those organizations involved in, or in part with, the transportation, handling, storage, delivery and sale of automotive, heating and aviation fuels, LPG, bitumen and lubricating oils. It will also be of use to external assessors and certification bodies.

ISBN 0 85293 193 X

Available for sale from the IP Library, at a cost of £40.00 inc. postage in UK and Europe (outside Europe add £5.00).

Code of Safe Practice for Contractors Working on Petrol Filling Stations

This code of safe working practice is intended to provide guidance to all companies and individuals who are contracted to carry out work on petrol filling stations. Such work can range from regular maintenance and servicing of equipment to repairs and major modifications to facilities.

The aim is to assist contractors to carry out work in a safe manner and in compliance with legislation, and to prevent incidents and accidents.

The code incorporates model work control procedures which are designed to enable both site controllers and contractors to discharge their legal duties with regard to providing safe working conditions for employees and safe access for members of the public. It will be a matter for purchasers of contracted services to adopt and adapt these model procedures to suit their own requirements.

ISBN 0 85293 194 8

Available for sale from the IP Library, at a cost of £40.00 inc. postage in UK and Europe (outside Europe add £5.00).

Petroleum Measurement Manual Part VII: Density, Sediment & Water. Section 2: Continuous Density Measurement

This revised standard describes the latest technologies for the continuous determination of the density of liquids and gases including stable crude oils, enriched crude oils, condensates, natural gases and other liquid and gaseous products commonly encountered in the petroleum industry. It details equipment used for continuous density measurement and covers the installation and proving of this equipment.

See page 453 for more information

ISBN 0 85293 180 8

Available for sale from the IP Library, at a cost of £52.00 inc. postage in UK and Europe (outside Europe add £5.00).

CRINE Standard Conditions of Contract

Designed to reduce significantly the inefficiencies associated with the repeated drafting and reviewing of contracts, and to facilitate a greater sense of partnership between contractors and oil companies. Main terms and conditions in major areas of work have been standardized in a suite of contracts, meaning it is no longer necessary for parties to carry out a full contractual review on each and every tender.

Published in June 1997 and available from the IP Library:

- Construction
- Design
- Well Services
- Offshore Services
- Onshore Services

Due to be published by the end of the year:

- Mobile Drilling Rigs
- Marine Construction
- Purchase Order Terms & Conditions (Short Form)
- Supply of Major Items for Plant & Equipment

Available for sale from the IP Library at a cost of £24.00 each. £195.00 for set of nine. Substantial discounts for bulk orders.

For more information on how to order these Publications please contact The Library, Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR, UK. Tel: +44 (0)171 467 7100 Fax: +44 (0)171 255 1472.

e-mail: Lis@petroleum.co.uk

IP Conferences and Exhibitions

IFEG Conference

Re-Engineering the Energy Information Service London: 6 November 1997

- Knowledge management
- Professional and personal competencies
- Business process re-engineering
- Intranets

and other technological developments are changing the way information services for the energy industry are organized and managed. Information professionals and their employers need to understand their impact. This Conference will translate management jargon into practical action.

International Conference

The World's Your Oyster: New Opportunities for Upstream Oil and Gas London: 18 November 1997

The structural changes wrought in the oil and gas world during the nineties have far reaching consequences for service providers and contractors as well as oil companies. A positive view of the future by analysts coupled with a renewed appetite for investment in the sector by the banks have created significant new opportunities for upstream oil and gas. This Conference will consider these issues from the standpoint of oil companies, operators, contractors and financiers.

Speakers include: **lain Paterson** (International Director, Enterprise Oil plc); **David Owen** (Industry Affairs Manager, Amerada Hess Ltd and CRINE Network) and **Colin Bousfield** (Director, BZW Energy Finance).

Who should attend?

Oil company strategists and planners, entrepreneurs and investors, bankers and their financial and legal advisors, contractors and service providers.

3rd International Conference on

Logistics – Competitiveness through Innovation London: 27 November 1997

In reviewing the logistics of petroleum products from the refinery to the end user via bulk storage terminals, this Conference will focus on those links in the chain where value can be added, through new technology, developments in IT, outsourcing and rationalization. It will be of interest to oil company general managers, strategists and planners as well as contractors, equipment suppliers and service companies.

Speakers include: Michael Everard CBE (Chairman, FT Everard & Sons Ltd); Peter Pass (Operations Manager, Murco Petroleum Ltd) and Graham Douglas (Business Change & Systems, BP Oil Europe).

Conference and Exhibition

Oil Spill Response – The National Contingency Plan

London: 10-11 March 1998

In recent years, the UK has suffered two large oil spills. One of these involved the largest shore-line clean-up in the UK since the *Torrey Canyon* incident over 30 years ago. In the light of these incidents, the National Contingency Plan has been reviewed and revised, and at the same time, there have been many new innovations to oil spill response on the international scene.

This Conference will address the key issues affecting all those involved with oil spill response in the UK and will attract representatives with a common interest in oil pollution control, representing the maritime counties, regions, districts and the port authorities of the UK.

An exhibition will be held in association with the Conference. Space is limited and potential exhibitors are advised to contact the Conference Department for further details, together with a list of sponsorship opportunities available in association with the Conference.

Seminars on

Opportunities in the Brazilian Oil and Gas Industry

London 10 November and Aberdeen 12 November

The demonopolization and liberalization of Brazilian upstream oil and gas enacted in August 1997 will stimulate substantial new foreign investment in 1998 and beyond. These Seminars will outline the significant new opportunities that will arise for UK suppliers and service companies.

Speakers include: Lord Clinton-Davis (Minister for Trade, DTI) and Dirceu Abrahao (E&P New Ventures Manager, Petrobras).

Who should attend?

Potential investors in acreage and exploration, operating companies and contractors, suppliers of materials and services especially small medium sized companies specializing in niche technologies involving deepwater, subsea operations and field rejuvenation.

In order to encourage maximum attendance by UK service and supply companies, a *specially reduced* registration fee of £100 plus VAT is offered. Tel: +44 (0)171 467 7100 Fax: +44 (0)171 255 1472.

To obtain copies of the programmes and registration forms when published, please contact: Conference Department, The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR, UK. Tel: +44 (0)171 467 7100 Fax: +44 (0)171 255 1472 Internet Address:

http://www.petroleum.co.uk/petroleum/

Diary Dates

Exploration and Production Discussion Group

'The Ethics of Burning Natural Gas for Power Generation'

Tuesday 14 October, 17.00 for 17.30 until 19.00 John Flemming FBA, Warden, Wadham College, Oxford

IP Contact: Jenny Sandrock

Energy Economics Group

'The Fundamental Impact Competition is Having on the Gas Industry'

Monday 20 October, 12.00–14.15

Clare Spottiswoode, Director General of Gas Supply, OFGAS

This meeting includes a buffet lunch at a cost of £15. Prior registration is essential. Please write or fax for a registration form, which will be available in the week commencing 8 September.

IP Contact: Jenny Sandrock

London Branch and Exploration & Production Discussion Group

'Decommissioning and Re-use – Myth, Liability or Asset?'

Tuesday 21 October, 17.15 for 18.00

Mr Mike Spaven, Northern Area Asset Manager, Phillips Petroleum Company UK Ltd

Maureen is a very large and technically unique structure located 155 miles north-east of Aberdeen. It is now reaching the end of its economic life and will need to be decommissioned under UK and international legislation. Mike Spaven, Phillips' Asset Manager for the North Sea area, will focus on the processes being followed, re-use opportunities and the need for an effective communication programme. The relevance of Maureen in the context of the North Sea will be discussed.

Tea and biscuits will be served at 17.15. The meeting will be followed by light refreshments. IP contact: Mr J M Wood Tel: +44 (0)171 467 7128

All meetings are held at the Institute of Petroleum unless otherwise stated. Please tell the IP contact if you plan to attend any of these free meetings Environment and Energy Economics Discussion Groups jointly with the Institution of Chemical Engineers

'The Technical Significance of the National Air Quality Strategy Proposals'

Tuesday 28 October, 17.30 for 18.00

Speakers from the Department of Energy and Transport will outline the proposals and their perceived implications while industry representatives will respond to them from the floor. The intention is to allow substantial time for questions and debates.

The meeting will be followed by refreshments at a cost of ± 20 including VAT. Prior registration is essential. Please write or fax for a registration form.

IP Contact: Jenny Sandrock

London Branch

'Reservoir Management in the Future'

Tuesday 11 November, Tea at 17.30 for 18.00

Ian Phillips, Reservoir Decision Centre Manager, Aberdeen

at the Royal School of Mines, Mineral Resources Engineering, Prince Consort Road, London SW7 2AZ

The presentation will cover:

- emerging sensor and control technologies that will enable us to better monitor and manage production from wells;
- the integration and management of the resulting large volume of data;
- using advanced databasing and visualization software;
- the likely economic benefit of implementing this technology.

Energy Economics Group

Thursday 13 November, 17.00 for 17.30 until 19.00

John Dawson, Group Public Affairs Director, The Automobile Association, will speak on taxation policy on transportation fuels.

Exploration & Production Discussion Group

'Offshore Underbalanced Drilling Operations'

Wednesday 19 November, 17.00 for 17.30 until 19.00

John Foy and Peter Brett, Senior Well Engineers, Shell UK Exploration & Production

IP News

NEW MEMBERS

Mr M S Affara, Arab Investment Mr A Al-Turki, Qatar General Petroleum Corporation Mr F Apaydin, Saben AS Mr C J Balchin, M B Consultants Mr A Bionda, Mundogas Zyrya Oil Mr C G Cain, Rayleigh Mr R Campbell, Ward Lester Group Miss P A Carberry, Defence Evaluation & Research Agency Dr P A Collins, Reading Mr Q Compton-Bishop, Rolatube Technology Limited Mr A Ewens, McDermott Marine Construction Limited Mr A S Hicks, Batt Cables plc Mr D A Kelso, DSD Consultancy Services Dr T Kikabhai, Bolton Mr C C R Lond, Grimsby Mr A MacGregor, Currie & Brown International Mr R E Martin, Skillwatch Limited Mr S R McColl, AUPEC Mr W McGuire, Saipam (UK) Limited Mr C S Mearns, Aberdeen Mr M Mitchell, London Mr J O'Connor, HOV Inc Mr M J Oga, Hydro Texaco Latvia Mr J W Pasquale, HBG (Marine Loss Adjusters) Limited Dr G Pollio, Marlow Mr F Ravizza, Fawley Mr J P Robson, TR Oil Services Limited Mr C Sayer, Ersan Petrol Sanayii AS Mr T D Sharp, Arthur Andersen Mr P M Stephenson, Able UK Limited Mr J Warren, Ward Lester Group Mr P D Wood, Sedbergh Mr J Yarjani, International Bureau for Energy Studies

STUDENTS

Mrs C Emeribe, London Mr B Ibikunle, London Miss I Oyekanle, Bristol

NEW CORPORAT

Brobot Petroleum Ltd, Thorpe Road, Melton Mowbray, Leicestershire LE13 1SM, UK.

Representative: Mr A J Bates, Managing Director

Brobot Marketing Ltd is involved in the regional distribution of oil to domestic and commercial markets, filling station operators and suppliers to smaller dealers.

Powerplan Ltd, 39 Villambrosa Street, Hamrun HMR 06, Malta.

Representative: Mr G Farrugia, Managing Director

Powerplan Ltd is a provider of EU Standards equipment, systems and supplies related to the petroleum service market. The company's focus is to develop an international network, giving it access to the very latest technologies in the industry as well as providing it with reliable and up-to-date expertise as and when required.

Wesumat Car Wash Equipment Ltd, Unit 14a Oak Industrial Park, Chelmsford Road, Great Dunnow, Essex CM6 1XN, UK.

Representative: Mr M S Russell, Managing Director Wesumat Car Wash Equipment Ltd is a supplier of vehicle wash equipment, service and chemical supplier, provider of facilities management services and a marketing consultancy for vehicle wash operations.

NEW CORPORATES

Ledingham Chalmers, 1 Golden Square, Aberdeen AB10 1HA, UK.

Representative: Mr David Laing, Managing Partner Ledingham Chalmers provides legal services to the exploration and production and oil services sector with particular emphasis on the UKCS and the Caspian Region, operating from permanent offices in Aberdeen, Edinburgh, Baku, Istanbul and the Falkland Islands. Its qualified personnel have experience of production sharing and joint venture agreements, asset purchase and sale, joint operating, utilization, transportation and sale agreements.

Goldman Sachs International, Peterborough Court, 133 Fleet Street, London EC4A 2BB, UK.

Representative: Mr C Holmes, Research Analyst

Goldman Sachs International is a leading international investment banking and securities firm providing a full range of investing and finance services to corporations, governments, institutions and individuals worldwide. Goldman Sachs has over 40 fully dedicated energy professional located worldwide to over 150 companies through a variety of creative financing and merger transactions totalling over £200bn.

NEW FELLOWS

Mr Dennis Clark OBE FInstPet

Mr Clark obtained an HND in Mechanical Engineering from Constantine College. He is currently Chairman of the Hydrocarbon Development Group, and has held this position for the past two years. Previously he was Chairman and Chief Executive of Amec Process & Energy Limited. Between 1982 and 1989, Mr Clark was Managing Director of Press Offshore, which was re-named Amec Offshore in 1990. By the time Mr Clark left in 1989, Press Offshore was the largest offshore oil and gas construction company in Europe. Mr Clark was awarded the OBE in 1989 for services to the offshore industry and the northeast of England. For the past ten years, Mr Clark has been Chairman of the Northern Offshore Federation, which is a body that represents 300 Northern companies involved in the offshore industry. He is an active member of the Institute.

Dr John Cousins FinstPet

Dr Cousins graduated from Southampton University with a BSc in Geology and four years later obtained a PhD in the same subject. He is presently Chairman and President of Mobil North Sea Ltd. Previously he was Vice President for Mobil New E&P Ventures, Europe/Africa/Russia and for Mobil New Business Development, both based in Fairfax, US. Dr Cousins is an active member of the Institute.

Mr Peter Everett FinstPet

Mr Everett graduated from Edinburgh University with a first-class BSc degree in Mining. He joined Shell International Petroleum Company as a trainee engineer in 1955. Two years later he gained his first operational experience in Indonesia. After spending three years there Mr Everett moved to Brunei, the first of three postings there. Four years later he moved to Trinidad, and left in 1968 having been promoted to Chief Petroleum Engineer. Between 1968 and 1979, Mr Everett worked in the Netherlands, Brunei and Nigeria. He returned for his final visit to Brunei in 1979, as Managing Director. When he left in 1984, Mr Everett was invested with the Seri Paduka Mahkota 1st class award for services to the country by His Majesty the Sultan of Brunei - the highest order to be bestowed upon a commoner. Mr Everett's final posting in Shell was as Managing Director of Shell UK Exploration & Production until he retired in 1989. He is currently a Non-Executive Director of a number of companies including Ramco Energy plc. Mr Everett is a Honorary Professor of Heriot-Watt University and an active member of the Institute.

IP News

NEW FELLOWS

Mr James L Stretch FinstPet

After qualifying as a Chartered Accountant in 1960, Mr Stretch joined British Energy Group I.C. Gas in 1961 becoming Group Financial Controller. In 1973 he was appointed a Director of the Group's North Sea company, Century Power & Light Ltd and in 1979 he was made responsible for all Group upstream activities, becoming Managing Director of Century and also of I.C. Gas Oil Operations Group. In April 1987, on the de-merger of I.C. Gas, Mr Stretch joined Agip (UK) Ltd as Assistant Managing Director, becoming Deputy Managing Director. From 1987 until 1995, he was one of two executive directors of Agip (UK) Ltd, during which time the company moved from a purely non-operating role in exploration and production to operating the development of three North Sea fields. He remained on the Board of Agip (UK) until August 1996 when he was appointed Chairman of PanCanadian North Sea Limited. Mr Stretch is an active member of the Institute.

Mr J Tudor Williams FInstPet

Mr Williams is an Oil and Marine Industry Consultant for CWA Consultants Ltd, based in London. His responsibilities include; leading a specialist CWA department involved with claims handling; contamination incidents; solving disputes related to bulk marine transportation; and the storage and processing of crude oil and products together with the provision of advice on industry contractual disputes. Before joining the company, he was involved with major oil industry projects in the UK and abroad. Mr Williams is an active member of the Institute.

IP ? THE INSTITUTE OF PETROLEUM

Branches Regional Organizer

The IP seeks to appoint a Part-time Branches Regional Organizer for the North of England to support the development of local programmes and increase the involvement by members, both individual and corporate, in 'Lifetime Learning', networking and social activities.

The role will involve supporting the Branch Committees primarily,

- in the development of Branch programmes including securing of speakers;
- administration;
- in liaison with existing Corporate members and identification and pursuit of new ones.

The postholder will work closely with the Branch Committees but will report to the IP Management in London on the progress of Branch activities and make recommendations for improvement or necessary support.

Qualifications and experience required:

Knowledge of the industry;

A self-starter, highly committed and able to work without supervision;

- Good presentational skills;
- Good organizational skills;
- Committed to the philosophy of the Institute;
- Mobility and enthusiasm;
- Likely early retirer seeking part-time employment.

Scope: Located in the North supporting Stanlow, Northern, Yorkshire and North Eastern Branches involving up to 2–3 days per week (100–130 days per annum) on a per diem rate of £100 plus travelling expenses.

Apply in writing enclosing CV and letter of justification to: John Evans, Membership Services Director, The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR.

CERTIFICATES OF APPRECIATIO



Mr Dave Peppitt

Chairman of IP Sub-Committee ST-B Dr Harry Read presents Mr Dave Peppitt with his award.

Dave moved to Flotta to join Occidental in 1975 and is currently Laboratory Manager for Elf Enterprises Caledonia Ltd. He joined the IP Sediment and Water panel (ST-B-3) in 1985 and was appointed Chairman of the panel in 1992. During this time he has contributed a great deal to test method development. In particular he has led the development of test methods for the determination of water and sediment in crude and finished products, which are required to meet the current demands of the petroleum industry.



Mr David Byng

Chairman of the IP Sub-Committee Dr Harry Read presents Mr David Byng with his award.

David has been a very active member of ST-B-11 for over 30 years, making numerous useful contributions to the panel's activities for a wide range of aviation test methods. With his experience of working in the Portsmouth Naval Aircraft Materials Laboratories he has been able to provide the panel with good sound practical advice on numerous topics. His most recent panel contribution was the splitting of IP 216 (the field and laboratory particulate test method) into two separate methods, IP 216 and IP 423. These were published in the 1996 IP Test Method Book.

The George Sell Prize

This prize, value £250, is awarded periodically to the author of what is judged to be the best original petroleum technical paper of recent publication. The subject matter may relate to any aspect of petroleum technology viz. exploration, refining, chemistry, physics, environmental science etc. Reviews and publications of joint authorship are not accepted. Applicants for the 1997 award should send copies of their papers in English that have been published during 1996/1997 with a covering letter to:

Mr John Evans, The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR, UK.

Around the Branches

ABERDEEN

14 October:	The Britannia Field Development
	Speaker: Jim Briggs, Chevron UK Ltd
11 November:	An Update on the Eastern Trough Area
	Project (ETAP)
	Speaker: Mike Hedges, BP Alliance
28 November:	Annual Branch Dinner
	Main speaker: Sir Colin Marshall
	Supporting speaker: Len Murray
9 December:	Oil Spill Response
	Speaker: Archie Smith, CEO Oil Spill Response Ltd
1998	
13 January:	The Clair Field Development
and the second sec	Speaker: tbc
10 February:	AGM, The Maritime Museum, Aberdeen
10 March:	Faith in the Offshore Oil Business
	Speaker: Angus Smith
7 April:	First Point Assessment
	Speaker: tbc
12 May:	Alliancing - the Truth Behind the Hype

EAST ANGLIA

16 October: Alternatives to Fossil Fuels Speaker: name tbc, Greenpeace, London Venue: Nelson Hotel, Norwich Contact: Chris Kemp: 01508 480800

Speaker: Peter Rushmore, Rushmore Associates

EDINBURGH & SOI EAST SCOTLAND

20 October:	Mass Flow Measurement Speaker: tbc
4 November:	Young students' visit to BP Grangemouth
11 December:	Insulation Systems for Offshore Pipelines Speaker: David Haldane, Heriot-Watt University
1998	
12 February:	AGM followed by The Channel Tunnel – a 200 Year Old Dream Speaker: Warren Johnson, HTC
February (tbc):	Annual Student Lecture Environmental Engineering Speaker: Professor Roland Clift, Surrey University
12 March:	Human Error in Safety Speaker: Dr David Embury, Managing Director, Human Reliability Associates
May (tbc):	Annual Spouses' Event

ESSEX		
8 October:	LPG – Liquid Under Pressure Speaker: David Hepworth, Conoco	
12 November:	Ladies Evening: <i>The Gordon's Gin Story</i> Speakers: Hugh Williams and Liz Page, United Distillers	
1998		
14 January:	The Work of the Harbour Master on the River Thames Speaker: Captain Peter Bush, Harbour Master (Lower District), Port of London Authority	
11 February:	AGM, followed by Formula One Racing Fuels and Lubricants Speaker: Dr Tony Harlow, Research Department, Mobil Oil Company Ltd	
11 March:	Oily Water Separation Plant at OIKOS, Canvey Island Speaker: G W Booker, Director, OIKOS Oil Storage Ltd	
20 March:	Annual Dinner/Dance	
	ESSEX 8 October: 12 November: 13 November: 1998 14 January: 11 February: 11 March: 20 March:	

HUMBER

9 October:	Petroleum Coke Manufacture and Its Uses Speaker: Mr R M Chatham, Conoco			
24 October:	Annual Dinner/Dance Venue: Beachcomber			
27 November:	Piper Alpha Disaster – Investigation and Conclusions Speaker: Dr J Dyer, Dr J Dyer and Associates			
1998 5 February:	Fluid Catalytic Cracking – Operating Experiences (preceded by AGM) Speaker: Mr P Robson, LOR			
6 March:	Annual Dinner Venue: Beachcomber			
2 April:	Ladies Evening			
14 May:	Visit to Associated Petroleum Terminal Jetties and Facilities – Immingham			

LONDON

21 October:	Decommissioning and Re-use – Myth, Liability or Asset? Speaker: Mr Mike Spaven, Northern Area Asset Manager, Phillips Petroleum Company UK Ltd		
11 November:	Event at Imperial College Speaker: Ian Phillips, Haliburton		
1998 January (tbc):	Talk on the Internet and its value to the Industry		

Around the Branches

LONDON CONTINUED

17 February:	IP Week event	
March (tbc):	Growth in Air Passenger Transport	
April (tbc):	Independent Oil Storage – Growth or Decline?	

MIDLANDS

8 October:	Energy Efficiency Best Practice Programme Speaker: Professor David Reay, ETSU, Harwell		
19 November:	Stress in the Workplace Speaker and venue tbc		
1998			
23 January:	Annual Dinner Dance		
18 February:	AGM, Bass Brewery, Cape Hill, Smethwick, followed by tour of brewery and buffet		
18 March:	Heavy Duty Engine Oil and Extended Oil Drain Speaker: Mr Martin Redguard, Esso Research Centre, Abingdon		
15 April:	Paper and speaker to be advised		

SOUTH WALES

14 October:	<i>Lichens and Air Quality</i> Speaker: Dr William Purvis, Natural History Museum Venue: Texaco Refinery, Pembroke
November (tbc):	Venue: Mobil (BP) Oil Llandarcy Refinery Ltd
1998 20 January:	Visit to Panasonic at Bridgend
20 February:	AGM and Sugarcraft Speaker: from Camarthen Guild of Sugarcraft Venue: Elf Refinery, Milford Haven
24 March:	An Oil Refinery for the Next Millennium Speaker: Bob Nutt, Elf Oil Venue: Elf Refinery, Milford Haven
27-29 March:	Weekend visit to Dublin

STANLOW

9	October:

9 December:

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Applying Lessons Learned from the Upstream to the Downstream and Process Industry Construction Speaker: Mr Arthur McQuillian

Railway Safety and the Channel Tunnel

DISCOUNTED RATES TO IP MEMBERS

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Speaker: Mr Oliver Steed, EQE International Ltd

NORTH-EAST

7 October:	Energy Efficiency Best Practices Professor David Reay, David Reay Associates IP/PiTANE Social – Quiz, Buffet, Disco		
7 November:			
1998 3 February:	AGM followed by speaker		
March (tbc):	Intelligent Pigging – Pipeline Integrity		
April (tbc):	Visit to North-East Offshore Construction yard		

NORTHERN

11 November:	Packaging – Whose Waste is it Anyway? Speaker: Tony Hancock, Stockport Technic College			
November (tbc):	Ladies Evening			
1998				
17 February:	Additives			
	Speaker: John Moores, Stockport Technical College			
6 April:	HotPot Supper			
	Venue: Belfry Hotel; Handforth			
17 April:	Surfactants			
	Speaker: Mr C Irwin, Stockport Technical College			

SOUTHERN

11 November:

Peugeot Motor Racing: An Inside View Contact: Todd Calveley: 01703 896281

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IP W THE INSTITUTE OF PETROLEUM

Annual Dinner 1998 Grosvenor House, Park Lane, London W1

Wednesday 18 February 1998 at 18.45 for 19.30

- Tickets can only be purchased by Individual Members and Corporate (Company) Members of the Institute of Petroleum (IP).
- The price of a ticket is £125.00 plus VAT for Individual Members and for nominated representatives of Corporate Members, and £170.00 plus VAT for their non-Member guests. Full payment must be received before tickets can be guaranteed.
- Individual Members may apply for a maximum of five tickets. Corporate Members may apply for individual tickets, or for one or more complete tables of 10 places.

It is the responsibility of applicants to establish whether or not their guests are individual Members. Corporate members should note that only the company's nominated representative to the IP is entitled to the reduced rate, other employees or guests must be paid for at the non-Member rate, unless they are individual members in their own right.

• Applications should be made by completing the form below and sending it to The Institute of Petroleum, with the full remittance, by Friday 24 October 1997. Applications received after 24 October 1997 will be considered separately.

- Companies or individuals wishing to share tables must state this when completing the application form, as changes cannot be made after tickets have been allocated.
- Tickets will be allocated and mailed during the week of 3 November 1997. Please note that the IP may be unable to meet requirements in full, and we suggest therefore that you do not invite guests until you have received your tickets. In the event that the Dinner is oversubscribed, allocation of tickets will depend on the degree of the applicant's involvement in IP affairs, and a waiting list will operate. Full refunds will be made as appropriate.
- Successful applicants should submit a confirmed guest list to the Institute of Petroleum by Friday 9 January 1998 at the latest, as names submitted after this date cannot be included in the printed programme.
- In the event of cancellation, a refund less a 20% administration charge of the total monies paid will be made provided that notice of cancellation is received in writing on or before 9 January 1998. No refunds will be paid after this date.

Dress will be black tie with decorations.

The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR, UK. Tel +44 (0)171 467 7100 Fax +44 (0)171 255 1472 A charitable company limited by guarantee. Registered No 135273, England

TICKET APPLICATION		THE OF P	INSTITUTE ETROLEUM
	Institute of Grosveno Wed	f Petroleum A r House, Park nesday 18 Fe	nnual Dinner 1998 Lane, London W1 bruary 1998
To: Pauline Ashby, Conferer	nce Administrator, The Institute of	Petroleum, 61 Nev	w Cavendish Street, London W1M 8AR, UK. Fax No. +44 (0)171 255 1472
I wish to order tio My application is made as a	cket(s) and enclose my remittance In Individual Member/on behalf of	*, made payable to a Corporate Mem	o The Institute of Petroleum. aber (delete as appropriate).
Individual Members	ticket(s) @ £125.00 each	= £	
Non-Members	ticket(s) @ £170.00 each	= f	
	+ 17.5% VAT	= £	Total= £
Name		_	IP Membership No.**
Company		_Address	
Tel/Switchboard:		_ Tel Direct:	Fax:
Signature		Date	
l confirm that I have read and a	gree to the terms and conditions detaile PLI * Payment should be made by ste ** Please teleph	ed above. EASE PHOTOCOPY rling cheque or draft ione the IP Membersh	Y THIS FORM drawn on a UK bank. This is not a tax invoice. nip Department if unknown.