**APRIL 1993** 

#### The Institute of Petroleum



# PETROLEUM REVIEW



UK budget springs PRT surprises

Fowards a low-cost culture by Rex Gaisford

> Alba floating storage unit launched

### Shipping

Current concerns regarding the ageing tanker fleet

US contingency plans for oil spills

### Environment

Saudi view of the relationship between the environment, energy and development



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## PETROLEUM REVIEW

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### Contents

Contents	
News in Brief	150
Newsdesk	.152
<b>Oil spill contingencies</b> Plans for responding to oil spills on US coasts	158
Tankers When will the ageing tanker fleet be replaced?	. 161
Floating storage unit launched	165
UK budget Surprise tax changes	
Forthcoming Events	.168
Terminal upgrade	170
<b>Environment</b> The environment, energy and development by Hisham Nazer	174
The Northeast prepares for the unthinkable	
Keeping pace with the law	180
North Sea CRINE and the low cost culture	182
<b>Classification</b> Environmental classification of complex hydrocarbon mixtures .	186
Information Service News	
Technology News	190
People	
Institute News Jobs/Consultants	

Cover photo - The launching of the Alba FSU. Photograph by Jeff Jones

### ... news in brief

#### 23 February

A privately-owned Turkish construction company has signed an agreement to build a petrochemical plant in Russia.

**BP** is reducing its interest in its Papua New Guinea exploration projects in a deal with Exxon.

Ampolex, the Australian oil and gas producer, has announced a 114% profit jump aided by the start up of the Kutuba project in Papua New Guinea.

**Kvaerner of Norway is planning** a 730km power line to supply hydroelectric power from Norway to Suffolk.

#### 24 February

International Petroleum Corporation of Canada has announced the acquisition of interests in two onshore UK blocks from BP and British Gas.

**Texaco has completed the** acquisition of Union Jack Oil's 7.5% interest in block 29/5b which includes the Franklin field.

**Royal Dutch Shell faces a fur**ther charge of £65M as a result of the currency dealing of its partly owned Japanese subsidiary.

#### 25 February

Petroleos de Venezuela has been ordered to cut production by 103,000b/d by energy minister Alirio Parra as part of the recent OPEC agreement.

#### 1 March

**Statoil is pulling out of off**shore China after more than a decade because of poor results.

Twenty companies have applied for blocks in Norway's 14th offshore licensing round.

**BP is selling its 49% stake in** Olympic Dam mining venture in Australia for \$455m including debts of \$273m.

#### 2 March

**BP** Chemical is to make 1,400 redundancies this year and a further 2,700 by 1995 in the face of a slump in German demand.

The World Bank is to invest more than \$264m in power plant modernisation to reduce air pollution in Central Europe.

**Elf's Nigerian subsidiary has** begun production from the offshore Afia field

#### 5 March

An oil worker was killed on Shell's Brent Delta platorm while carrying out routine maintenance.

#### 8 March

**BP and Phillips have agreed to** swap four blocks adjacent to the median line between the UK and Norwegian sectors.

Occidental is to sell its 45% stake in Trident NGL back to the company for more than \$120M as part of its debt reduction programme.

The International Energy Agency predicts that oil exports from the former Soviet Union will fall to 1.8mb/d in 1993 from 2.08 mb/d last year.

**Mobil Oil Singapore has signed** a contract for the construction of 1 million barrels of storage capacity at Chiyoda Singapore's 245,000b/d refinery.

A fire a West Africa's biggest refinery near Abidjan in the Ivory Coast has caused serious damage.

Iraq has claimed that it has lost up to \$55bn in oil exports as a result of the UN-imposed embargo.

#### 9 March

Mr Gabriele Cagliari, chairman of Italy's state owned energy and chemicals group ENI has been arrested on corruption charges regarding the illegal funding of political parties.

Statoil has confirmed a 300-440m barrel oil discovery 85km from the Heidrun development. Gas reserves in the field could amount to 10bn cu m.

**Turkey and Azerbaijan have** agreed to build an oil pipeline from the Baku oilfields to the Mediterranean port of Ceyhan.

#### 10 March

**Regional electricity supplier** MANWEB has signed a new contract to increase its sales of gas to industries in the North Wales and Merseyside region.

**BP has formed a consortium** with three Japanese companies to explore an area in Xinjiang, western China.

The 18-well abandonment phase at Hamilton's Argyll, Duncan, Innes fields has been been completed approximately three weeeks ahead of schedule, Stena announced.

#### 11 March

Two hundred North Sea officers and ratings employed by supply vessel operator Farsted UK have voted to accept a package of new working conditions which include transfer of employment to Acomarit of Limassol, Cyprus.

Esso Australia has reported an operating profit of A\$482M in 1992, down from A\$662 a year earlier. Production of oil and condensates by the company averaged 196,000 b/d.

#### 14 March

AEA Technology researchers are to begin testing a device to harness wave energy at Dounreay.

France has warned Unita rebels to stay clear of Elf-operated oil installations in offshore Angola.

#### 16 March

**Total has begun drilling its first** of four appraisal wells in offshore Myanmar.

The International Energy Agency is to establish centres for gas technology information in Copenhagen and Washington.

The European Community fisheries committee has agreed aid of Ecul.6 million to be divided among 1,200 Spanish fisherman and boatbuiders affected by the Aegean Sea spill off La Coruna in December.

#### 17 March

The port of Rotterdam has introduced reduced port dues for 'better behaved tanker owners' under a 'Green Award' scheme.

The Taiwanese government is to privatise the Chinese Petroleum Corporation which has a monopoly on oil imports and processing totalling around 23 million tons a year.

Norwegian drilling contractor, Smedvig, is to take delivery of a new jack-up rig, West Epsilon, said to be among the most advanced in the world.

The Tomsk Oblast administration in Russia has extended the deadline for the Pudinsko-Parabel block bidding until 30 July.

**Premier Consolidated Oilfields** has announced a 27 percent increase in profits after tax to £15.1 million.

#### 18 March

Lord Cavendish of Furness has been appointed director of Nirex Limited. He was nominated for the position by the President of the Board of Trade, Michael Heseltine.

A Maltese registered tanker en route between Syria and Canada spilled oil from a hole in her side causing a 10-mile-long slick. The incident happened about 100 miles southwest of the Azores.

#### 19 March

**Gulf Canada Resources, 70** percent owned by Olympia and York Developments, is to sell a drilling rig and two icebreakers to Amoco Canada Petroleum.

**Pemex has announced that** Mexican oil reserves were lifted by 1.35 billion barrels to 65.05 billion barrels last year, reversing a 10-year decline.

Petroleum Review March issue We regret that because of problems following the introduction of new technology the photographs were not up to our usual standard.

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#### Report aims to increase UKCS competitiveness

A report by the Working Group on UK Continental Shelf Competitiveness has put forward 29 recommendations aimed at streamlining industry practices and ensuring the long-term viability of the industry.

The report published by the Department of Trade and Industry (DTI) examined and identified nine critical areas which, it says, 'have a significant impact on total costs'.

Many of the recommendations, however, simply establish that oil companies and government and regulatory bodies 'should continue to press ahead' with processes and reviews that are currently being undertaken.

Publishing the report, the President of the Board of Trade, Michael Heseltine, said: 'The competitiveness of UK industry is of vital importance to us all. As the working group has shown this this is well recognised by all involved in the oil industry; oil companies, their suppliers; their employees and the government.

'Many of the recommendations will be difficult, requiring innovative thinking and hard work. But the challenge is to ensure they are delivered. What is at stake is the future of the UKCS.'

Among the recommendations are for UKOOA to consider means of extending the use of standard clauses in unit and operating agreements and discuss with members what measures, including the use of standard or model clauses, might be introduced into tariff agreements.

A number of DTI initiatives should be progressed, according to the report. Simplified procedures for Annex B scrutiny, including the issue of guidance, should be completed by June 1993. The 'out of round' licensing policy should be operated as flexibly as possible and should continue to take a flexible approach regarding license obligations which can no longer be justified on technical grounds.

One of the most important developments is the 'cultural change' that the recommendations represent.

Launching the report, Energy Minister Tim Eggar, said that it represented the first example of cooperation between industry and government to increase competitiveness. This was particularly important where new areas were being opened up for exploration around the world and where even relatively mature provinces like the Gulf of Mexico entailed costs of one-seventh of those of the North Sea.

'If industry and government do not respond to the challenge there is a long-term threat to the industry,' said Mr Eggar.

He warned against 'dangerous complacency' in the industry with regard to the competitiveness of the UK offshore industry.

### BP confirms major oil find

BP has confirmed that it has discovered oil on block 204/ 24a, 170 kilometres west of the Shetland Islands. BP is the operator of the block with an 80 percent interest while Shell holds the remaining 20 percent.

Initial estimates put reserves in the range of 250 million to 500 million barrels. If such estimates prove accurate, the field would be one of the most important discoveries of recent years on the UK Continental Shelf.

Well 204/24a-2 spudded on September 9, 1992 in 496 metres of water – the deepest field to date in the UK sector is Magnus in 186 metres of water – was drilled to a total depth of 2,833 metres. It encountered 48 metres of oilbearing sand and flowed on test at 3,800 barrels a day of  $25^{\circ}$  oil through a one-inch choke. Gas was encountered at 246 standard cubic feet a barrel.

The announcement follows the awarding of a production licence to BP and Shell by the Department of Trade and Industry. The blocks had been applied for in the Fourteenth Offshore Licensing Round and the announcement had been made before other awards to 'enable BP and Shell to go ahead with their plans for work on a major new basin', according to Energy Minister, Tim Eggar.

The licence covers five blocks and part-blocks in the Faeroe-Shetland Basin and adjoin blocks originally awarded to Britoil in 1984 as part of the Ninth Round.

BP Exploration chief executive, John Browne, said the discovery will require further appraisal to define the reserves more precisely.

The company intends to carry out an extensive 3-D seismic survey on the blocks during the weather window this summer. No further wells are planned this year.

#### Management seminars

The World Petroleum Permanent Council and the Congresses have announced a series of seminars aimed at high potential middle management in the oil industry.

The seminars, to be held from12-16 July and 13-17 December, seek to give a broad global perspective and grasp of key issues facing the oil and gas industries.

The World Petroleum Congress, founded in 1933, is run at three-year intervals. The next congress – the 14th – is in Stavanger in Norway from 29 May to 1 June 1994.

Congress Secretary, Ms Anne-Grete Ellingsen, says the staging of the event in Norway for the first time reflects that country's growing importance as an oil and gas province.

The Council consists of 40 countries, each represented by a National Committee. A health and safety advisory service has been launched by by two assurance companies in a bid to cut the number of

Safety advisory service launched

claims for accidents at work. Plant Safety Limited, an associate company of Commercial Union Assurance and General Accident Fire and Life Assurance, is targeting small and medium sized businesses with its new service.

The service concentrates on the management of health and safety in line with recently introduced legislation. Qualified engineers located throughout the United Kingdom will provide advice on systems, procedures and safety policies. Monitoring and control of the operation will be carried out from Gateshead. In addition to keeping

clients up-to-date with changing legal obligations, Insurance companies may view the service as a positive risk improvement feature which the company believes should in time lead to a reduction in the number of insurance claims.

Despite the charge for use of the service and the possibility of a reduction in claims which the company is confident implementation of the service will bring, organisations taking part can expect no reduction in premiums paid to cover against accidents at work.

The Health and Safety Advisory and Surveillance Service (HASASS) will also operate a telephone advisory facility to deal with any immediate health and safety problems.

The Institute of Petroleum

### Ekofisk tank problems raise insurance fears

Phillips' troubled Ekofisk installation has received another setback when London underwriters delayed renewing cover for the storage tank after receiving a report indicating possible safety problems.

Underwriters commissioned the report from offshore consultants Noble Denton to examine aspects of the 2/4 tank, a major staging point for exports from the surrounding fields.

The report follows several months of often acrimonious exchanges between Phillips and the Norwegian Petroleum Directorate (NPD) relating to safety on the installation.

NPD director, Magne Ognedal, said that Phillips were asked to report last February on intermediate measures to be taken 'to operate the facility in a prudent manner' until possible long-term solutions could be put in place.

He stressed that while there had been no serious incidents lately, the NPD had some general concerns. It pointed out improvements it believed was necessary to operating standards that, if not performed, could seriously impair safety in the future.

The tank requires a short term upgrading until 1997 when permanent measures will be put in place.

Last year the NPD threatened to shut down the facility before the 1997 deadline.

Underwriters are confident that insurance will be put in place, but only after negotiations on the rate of cover.

The Ekofisk complex handles almost 500,000 barrels a day (b/d) of which 230,000b/d is net to Phillips from the seven Ekofisk fields.

The problems with the tank stem from subsidence at a rate of 30 centimetres a year.

Phillips is currently injecting 500,000 barrels of water under the tank in order to slow down the subsidence. In its latest proposal it intends to inject a further 320,000 barrels of water in the summer.

The NPD is also concerned about a backlog in the upgrading and maintenance schedule for the installation.

A spokesman for Phillips said the two organisations are in continous dialogue in order to ensure the 'safe and sound' operation of the complex.

#### Conoco announces discovery well

Conoco (UK) Ltd has announced the results of a successful appraisal well in block 41/24 in the southern North Sea.

Exploration well 41/24-3, six miles east of Scarborough in Yorkshire, was drilled to a depth of 4,834 feet by the Penrod 92 jack-up rig. The well tested 34.3 million cubic feet of gas a day through a 74/64 inch choke from the Zechstein formation.

Conoco, the operator, has a 50 percent interest in the block. Its partners, subject to final approval from the Department of Trade and Industry, are LASMO North Sea (40 percent) and Aran Energy Exploration (10 percent). Aran has recently farmed into the block.

Wells previously drilled on blocks 41/24 and 41/25 by Total had shown gas. Conoco, awarded the acreage in the 12th Licensing Round, has carried out extensive seismic surveys over the blocks. Decisions on further drilling and appraisal are awaiting the interpretation of well data are not expected for several months.

### Customs & Excise cede control of metering to companies

The govenment is to implement far-reaching changes in the measurement of hydrocarbon oil products for custom and excise purposes.

From 1 April the government has removed the requirement for meters and automatic tank gauges to be approved by HM Customs and Excise (C&E) before use for revenue accounting purposes.

For risk assessment purposes C&E will require from traders a schedule detailing which measurement method is to be used at each duty point from 1 April together with future updates of certain changes. The content and format of such schedules and updates will be a matter for discussion between individual companies and local C&E staff.

The government is also set to withdraw its proposal to extend compulsory metering for revenue accounting purposes to jetties and rail loading facilities.

It is also preparing to review its code of practice for the physical security of hydrocarbon oils at oil installations. Responsibility for complying with the objectives under the reviewed Notice 179S will rest with individual companies through the use of good trade practice.

According to C&E, the changes are designed to achieve a shift away from official involvement at each stage of the measurement assurance process.

Traders will be responsible for the accuracy of oil measurements for revenue purposes.

Instances of noncompliance will be dealt with by the issue of a formal estimate of revenue loss and in extreme cases by a review of the suitability of the warehousekeeper to store hydrocarbon oil in bonded premises.

Customs and Excise officials maintain that the changes will free up staff resources as well as creating a more flexible working environment.One officer involved in the implementation of the new regime said the, like many government departments, C&E 'were faced with 'changing demands, the loss of staff and cut-backs in resources'.

'We will continue to monitor industry self-regulation to ensure standards are maintained but the new rules will mean companies are more aware of their own legal obligations.

#### Ex-chairman's £1.5 million settlement

The former BP chairman and chief executive officer, Robert Horton, has received a £1.5 million settlement after being ousted from the company last year.

The settlement includes a 'golden handshake' of £750,000 with an equivalent sum being paid into a pension fund.

The company posted its first loss – £352 million – since World War I last month.

Mr Horton has since taken up a position as chairmandesignate of Railtrack, the British Rail division charged with looking after the infrastructure under the government's privatisation plans for the railways. The three day a week position carries a salary of £120,000 a year. He is also vicechairman of the British Railways Board, the remuneration of which is included in the Railtrack package.

#### Gas supply

The independent gas marketing company, Alliance Gas has signed two multi-milliom pound gas deals.

The company has reached a £50 million agreeement with Manweb Gas, the gas marketing subsidiary of the regional electricity company. Under the terms of the agreement, Alliance will ensure that Manweb has enough gas to meet an expected growth in its gas sales business over the next rthree and a half years.

Alliance also announced the purchase of gas supplies from the Conoco-operated Viking field located in the southern North Sea, 70 miles off the Lincolshire coast. Gas from the field will be marketed by Alliance to industrial and commercial businesses across the United Kingdom. The company has agreed to purchase half of field's production from BP Exploration

Alliance Gas, a joint venture between BP (50 percent), Statoil (40 percent) and Norsk Hydro UK (10 percent), currently supplies over 6,000 business sites including Marks and Spencers, ICI and Lloyds Bank.

#### Independent takeover

Energy Development Corporation (EDC) of Houston has gained control of UK independent Brabant Resources in the face of a hostile bid from Aberdeen Petroleum.

The company made an agreed bid of £9.6 million. Aberdeen accepted the offer of 58 pence a share for its 10 percent stake and will make a profit of about £500,000.

Aberdeen itself is fighting a hostile bid from Edinburghbased oil and communications company, Pittencrieff, which is offering two of its shares for 49 held in Aberdeen.

#### **DTI move to Aberdeen**

The Department of Trade and Industry has announced the setting up of a new office in Aberdeen that will involve the transfer of up to 60 staff from London.

The government had considered a report by Ernst and Young on the arguments for and against transferring the professional geologists and engineers of the DTI's Oil and Gas Division (Petroleum Engineering Directorate) to Aberdeen.

The office will initially have 60 staff and will take the lead in the issues of field development consents and the consideration of abandonment programmes. It will also process development applications (Annex Bs) from companies based in Aberdeen.

Energy Minister, Tim Eggar said in a written reply to a parliamentary question that although the report did not show a clear case for moving the entire Petroleum Engineering Directorate to Aberdeen it did raise wider issues.

'We can improve the service to [the Aberdeen-located] companies by providing multi-disciplinary teams in Aberdeen. I am pleased to announce that during the coming year the DTI will open an office in Aberdeen to provide key DTI services to that part of the oil industry based there.'

The report brought up two different recommendations.

It stated that it would be disadvantageous for the business of the DTI in a number of ways, many of which might be expected to affect indirectly the commercial interests of the oil industry. Counter to this, the report also stated there would be a small gain in terms of promoting an agglomeration of industries and skills in Aberdeen, which should improve the UK international position in offshore supplies and services, a significant world market.

#### Venezuelan deal

BP has reached an agreement with the Venezuelan state oil company PDVSA to reactivate the Pedernales oil field in the Orinoco Delta.

The field has been out of production since the mid-1980s but the company believes it can be brought back into production soon with output expected to rise to 20,000 barrels of around 20° oil a day by 1997.

The agreement for redevelopment represents the first upstream investment by a major oil company in the Venezuelan oil industry since nationalisation in 1976.

BP Exploration chief executive, John Browne, described the agreement as the first step towards further opportunities in the months ahead. The field, discovered in 1933, has produced 58 million barrels of oil from its northern flank through primary depletion. Some 500 million barrels of oil are believed to be in place but not all is recoverable.

#### China opens western basin for foreign oil exploration

China has announced that it is opening the southeastern sector of the Tarim Basin to foreign oil companies.

The basin, located in China's central Asian region of Xinjiang, is as large as Spain in area.

The five blocks on offer for international bidding cover 72,730 square kilometers. The blocks make up about one-eighth of the basin's total area.

Foreign companies are expected to take risk explorations in a span of seven years. When commercial strikes are made, foreign firms will share oil reserves.

Bidding affairs will be handled by China National Oil and Gas Exploration & Development Corporation (CNODC).Bidding starts March 1 and ends in October. A model contract drafted by CNODC will be delivered to foreign applicants before May 31.

CNODC has worked out standards for contracting on joint oil development by Chinese and foreign firms. 'The standards comply with international practices,' said CNODC vice president Zeng Xingqiu.

Related draft laws, now being assessed by the government, will provide legal guarantees for Sinoforeign cooperation.

CNODC declined to disclose crude reserves in the Tarim Basin, but reports say the basin contains 18 billion tons of crude oil, one third of the national total.

Exploration in the Tarim is made difficult by the presence of the Taklamakan desert, which covers two thirds of the basin.

China has completed the designing of a 3,400 km

pipeline running from Tarim to Louyang, a city in central China's Henan province. The formal date of its construction is currently being considered.

The basin is already an oil producer. Wells sunk in the central and northern parts of the basin yielded 800,000 tons of light crude last year.

The recent invitation for bidding signifies China's about face in its policy of self-reliance for oil development in the Tarim Basin.

China previously said direct foreign exploration in the Tarim Basin is not needed, insisting on selfreliance, as it has done with its two major onshore oilfields, Daqing and Shengli, which flowed 55.6 million tons and 33.5 million tons of crude respectively last year, both believed to be peak production levels.

154



#### Ship insurers tighten standards

The Joint Hull Committee has issued a schedule to London underwriters to be used when assessing shipping insurance.

The Hull and Machinery Information Schedule contains five pages of detailed questions designed to assess appropriate insurance premiums. Roger Nixon, chairman of the Joint Hull Committee, said that the schedule was designed to identify poor quality shipowners as well as ships.

The effect of the schedule could be to force unsafe ships from the market. The Institute of London Underwriters has publicly expressed its desire to see poor quality vessels scrapped although it admits that its reasons are not completely altruistic. The shipping insurance market has suffered from heavy losses and is determined to return to profitability. 'If the result is fewer unsafe vessels, especially oil tankers, so much the better,' said one source.

The schedule goes into details of management and company history, including previous employment of principals and ownership, past and proposed maintenance costs, crewing policy including whether officers or crew are employed directly or through a crewing agency, training programmes and information on current captains and chief engineers.

The vessel history is also scrutinised on conversions, change of class and previous ownership.

Details on the type of cargo, area of trading and charter must also be provided.

#### **Restoration for Siberian wells**

Texaco International Operations Inc. has concluded an agreement with Sutorminskneft, a Western Siberian oil and gas production association, to restore production from idle wells in the Sutormin field in Western Siberia. This project marks the company's first production venture in Russia.

'Texaco's participation in Western Siberia expands the company's activities into one of the significant producing areas in the world, while addressing one of the challenging problems confronting the Russian petroleum industry restoring production from idle wells,' said Texaco Inc. Senior Vice President Peter Bijur.

Although specific terms of the agreement were not disclosed, Texaco has secured oil export guarantees from the government and will receive a share of the earnings from the project which will be calculated separately from Russian taxes, tariffs or other duties.

Mr Bijur added, 'In addition to the current potential of well workovers and field development in this area, Texaco will be pursuing future opportunities in the Western Siberian region.' The company expects to commence field operations during the second quarter.

Located in the northern portion of the Tyumen region of Western Siberia, the Sutormin field lies approximately 200 miles south of the Arctic Circle and approximately 1,500 miles east of Moscow. The field, which contains 35° API gravity sweet crude and has recoverable reserves of approximately one billion barrels, is currently producing about 140,000 barrels of oil per day. Approximately 40 percent of the wells in this field are idle for various technical reasons.

#### Gas discovery

ARCO British has announced a successful appraisal in block 44/18, four kilometres north of the 44/18-1 gas discovery.

The well, 44/18-2, flowed gas at a stabilised rate of 34 million standard cubic feet a day through a 52/64 inch choke. The total depth of the well was 12,535 feet in 69 feet of water.

Block 44/18, in the southern North Sea 115 miles north-northeast of Great Yarmouth, was awarded in the 10th licensing round.

Participants in the well are ARCO, the operator, (60 percent), St James's Oil and Gas (25 percent) and Goal Petroleum (15 percent).

Additional drilling will be required to evaluate the discovery for possible commercial development.

#### Omani-Indian gas deal

A memorandum of understanding has been reached covering the delivery of natural gas by a submarine pipeline from Oman to India.

This memorandum of understanding calls for a detailed feasibility study on future demand for gas in India and the engineering design and construction of a proposed submarine pipeline between the two countries. It will be more than 900 miles long and have a diameter of 42 inches. Oman Oil Company Ltd will carry out this study.

Two further memoranda of understanding were also signed by representatives of the governments of Oman and India, Bharat Petroleum Corporation Ltd, Hindustan Petroleum Corporation Ltd and Oman Oil Company Ltd covering the construction of refineries, one in Central India and the other on the west coast of India. Each will have an initial capacity of 120,000 barrels a day.

### British-Borneo to review exploration

British-Borneo Petroleum Syndicate has confirmed that it intends to review its oil and gas investment policy over the coming months in light of the budget changes announced last month.

Although some of the company's existing assets will benefit from the reduction in the PRT rate the company has been undertaking a 'significant exploration programme' in both the United States and the United Kingdom.

Chairman Sir Douglas Morpeth said that while 'the elimination of Petroleum Revenue Tax for new fields could make successful exploration more valuable, the abolition of exploration reliefs will adversely change the overall economics of exploration in the North Sea. In the coming months the company will be reviewing its investment policy to determine if a change is warrented, within its core areas or towards other international opportunities.'

The company has plans to test the potential of its first exploration venture outside its core areas, in the Monte Caruso permit in Italy, with the San Fele well which is currently being drilled.

The announcement was made as British-Borneo released its preliminary results for the year ended 31 December 1992.

Oil and gas revenues were up 383 percent to £17.9 million and after-tax profits lifted 95 percent to £7.6 million.

The company completed the assimilation of the North Sea assets of Norsk Hydro and finalised the purchase of a 10 percent interest in the Victor gas field from Mobil for £21.4 million. The Victor interest was partly intended to generate cash flow and provide a shelter for exploration costs against PRT.

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### US contingency plans for oil spills

#### By Judith Gurney

The US Oil Pollution Act (OPA) of 1990 profoundly affects those involved in petroleum transportation, storage and handling in US navigable waters. In an attempt to prevent spills, it subjects vessel owners to greatly increased liability, mandates double hulls on tankers and requires tug escorts in certain busy tanker lanes. It also designates tanker-free zones in environmentally sensitive areas.

To ensure an effective response whenever and wherever devastating spills occur, it greatly expands the responsibilities and capabilities of the US Coast Guard to deal with emergencies. It requires that all companies owning or operating tank vessels, offshore facilities, or onshore facilities which could discharge into navigable waters or adjoining shorelines, draw up contingency plans for responding to an oil spill from their vessel or facility. These response plans must be approved by the US Coast Guard by 18 August 1993 for a company to operate in US coastal waters or in certain areas of the US coastline.

#### **Role of the Coast Guard**

The OPA assigns responsibility for the coordination and oversight of oil spill clean-ups to the Coast Guard at its newly established National Response Unit, located in North Carolina. The unit's National Strike Command will maintain a data base recording spill removal resources, personnel and equipment. This data base will include a classification of oil spill clean-up organisations. Private clean-up contractors who apply will be classified on the basis of their ownership or control of specialised equipment and trained personnel, which will be subject to Coast Guard inspection. They will be assigned a qualification class based on the size of their containment and protective booms, the number and size of their skimmers and vacuums, and their recovered oil storage capacity.

The National Strike Command oversees an Atlantic strike team located in New Jersey, a Gulf Coast strike team located in Alabama and a Pacific strike team located in California. These teams maintain response vessels and equipment for skimming, containing, storage and lightering. The Coast Guard also staffs 19 response sites located in high-risk, high transport areas, each with vesselof-opportunity skimming systems which can be attached to a Coast Guard cutter or a fishing vessel. These response sites also have high-seas booms and response trailers, as well as portable oil storage container bags. In addition, there are 49 Coast Guard sites along the coastline, each with response equipment, whose captains of the port have the responsibility of overseeing clean-ups in their regions. New Coast Guard buoy tenders, which service aids to navigation, will be equipped with either vessel-ofopportunity or onboard oil skimming systems. In the event of a spill, the Coast Guard will use its own equipment if it arrives first on the scene, or if private contractors cannot cope, it will hold the responsible party liable for clean-up expenses.

#### **Response plans**

Oil companies and shippers operating in US coastal waters after 18 August 1993 must demonstrate to the Coast Guard their ability to respond to the 'maximum extent practicable' to a 'worst case' oil discharge and 'to mitigate or prevent a substantial threat of such a discharge.' The OPA defines 'worst case' for a vessel as a discharge in adverse weather conditions of its entire cargo or, for offshore and onshore facilities, as the largest foreseeable discharge in adverse weather. Companies must indicate the availability of private personnel and equipment necessary to carry out their plans. Equipment

#### **US Coast Guard**

Capacities of oil spill recovery organisations for offshore and open ocean environments

Class	Recovery (barrels/day)	Storage (barrels)
A	50	100
B	1,250	2,500
С	10,000	20,000
D	20,000	40,000
E	40,000	80,000

must include booms to contain oil in different environments and water depths and to protect shorelines, skimming and vacuum systems with adequate capacities and seakeeping capabilities, and sufficient storage capacity to temporarily store recovered oil and contaminated debris for transportation and disposal.

A company has several options in compiling a response plan. The least attractive choice is the purchase and maintenance of the required clean-up equipment, personnel and systems itself. It is far more economical for a company to have a contractual agreement with an acceptable response contractor, or membership in an authorised oil spill response organisation. There are some 150 independent response subcontractors and non-profit cooperative spill removal organisations in the United States, formed by groups of companies having an oil spill exposure, which share out capital and costs. These have a good record of handling small spills in protected harbours, sheltered waters and land areas, but are not capable of responding to catastrophic spills in coastal or tidal waters involving, as in the case of the Exxon Valdez, some 200,000 barrels of crude oil. To date, only two national organisations qualify as response organisations for major spills, the Marine Spill Response Corporation and the National Response Corporation.

#### Marine Spill Response Corporation

The American Petroleum Institute was the driving force behind the creation, in August 1990, of the Marine Preservation Association (MPA), a membership organisation, and the Marine Spill Response Corporation (MSRC), an oil spill response company. MPA is an independent, non-profit corporation whose members, mostly oil companies, pay annual dues based on the number of barrels of oil they transport, or the number of vessels they operate, in US coastal waters during each year. Dues are used to finance the operational, capital and R & D costs of the MSRC, but do not cover expenses incurred in responding to spills. The latter will be recovered directly from the member spiller or from its insurer, up to the limits of the spiller's liability. In addition, the spiller will have to arrange separately for all firefighting, lightering and salvage services. If spill costs exceed what the spiller can pay, or if a spiller cannot be identified, clean-up costs will be borne by the federal government. Only MPA members may cite the MSRC in their response plans, and MSRC will normally only respond to spills of MPA members. The Coast Guard, however, has the authority to call on MSRC to respond to any spill, regardless of the identity of the spiller.

MSRC will maintain five regional response centres located in the New York/New Jersey metropolitan area, Florida, Louisiana, California and Washington state. (Alaska has its own response organisation, the Alveska Pipeline Service Company.) Every regional centre will have a variety of resources, including response vessels, various types of booms and skimmers, information systems, equipment for wildlife and shoreline rehabilitation and dispersants. (The Environmental Protection Agency, and certain individual states, require approval for partial year or year-round dispersant use). There will be three to six pre-staging areas within each region, each supported by vessels, equipment and personnel. Their location is based on proximity to sea, air and highway transport, and potential for response. Regions will contract with local clean-up firms and others for a variety of tasks.

The MSRC fleet of 16 210-foot vessels, similar to offshore supply boats, will be outfitted by August 1993. These vessels will have substantial deckspace to accommodate and deploy a full range of spill response equipment and will be



strategically stationed around the coastline, as well as in Hawaii and the Caribbean. They can store temporarily 4,000 barrels of recovered oil, provide accommodation for response personnel and serve as command and control centres for spill-fighting operations. Each has a helicopter landing pad and a barge towing capacity. MSRC will maintain 17 barges of 40,000 barrels capacity as initial storage vessels; the spiller will be responsible for providing additional storage, if required. The barges will serve as skimming platforms and will have heaters to facilitate oil flow.

Although MSRC was set up to respond to massive deepwater spills, the Coast Guard has issued regulations requiring that 20 percent of the cleanup capacity listed on a company's response plan be suited for near shore work in six feet, or less, of water. In order to provide this capability for MPA members, MSRC will have towable storage bladders with a 500-barrel capacity, and shallow water systems consisting of four shuttle barges and a selfpropelled platform, along with support boats. Most of the shallow water equipment will be mounted on trucks so that it can be taken to a spill site by road.

MSRC will maintain an integrated network of telephone, radio and computer communications systems to coordinate spill responses and compile information on weather, tides, ocean current and projected spill trajectory. There will be mobile communication command centres in each of the five regions, as well as one in Hawaii, and one in the Caribbean. These will be placed in standard, dry cargo shipping containers on flat bed trucks, and can also be taken aboard cargo aircraft. The organisation is planning a large R & D programme covering a wide variety of issues. A major early focus will be on oil-water separators, as the vessels of opportunity first in contact with a spill are frequently fishing boats with limited capacity to store recovered fluids. These require an effective, relatively lightweight mechanism to separate water from recovered oil.

#### National Response Corporation

The second major spill clean-up organisation, the National Response Corporation (NRC), is a joint venture between Miller Environmental Group, an environmental clean-up contractor, and Seacor Marine, one of the largest US offshore rig supply vessel operators. A for-profit, closely held corporation, NRC will rely on currently operating independent response contractors and augment their resource bases with specialised equipment and organisation. Members of its Independent Contractor Network will be provided with a wide range of response equipment suitable for major deepwater spills, including converted supply boats and barges. They will receive monthly compensation for storage, security, maintenance and repair of this NRCowned equipment.

NRC will provide the infrastructure to manage the resources deployed by members of its Independent Contractor Network (ICN) in a spill response and its personnel or representatives will be present at spills. It will provide for disposal and transport of oil wastes through its contractors, as well as oiled resource remediation but won't provide lightering or salvage.

Many shippers in the independent tanker trade, as well as several refineries, are NRC clients. Shipper clients pay an annual fee and a voyage fee, based on deadweight tonnage. They can name NRC, which has received a Coast Guard classification for response to all spills in all environments, in their response plans and access the services, manpower and equipment of all contractors in the ICN group, as required. In cases where an international tanker owner doesn't have a US office or a relationship with local ICN contractors, NRC will initiate the spill response; a NRC client, however, has the option of initiating a response directly with an ICN contractor. NRC provides clients with time and material schedules for each contractor in the network, as well as for NRC-owned resources when they sign their contract, and updates these as neces-sary. Clients either have standing accounts with NRC, or will be billed at the time of a spill.

#### Liability for spill damages

The OPA provides limited immunity for those responding to a spill for removal costs or damages that occur during the clean-up, providing that there is no gross negligence, wilful misconduct, personal injury, or wrongful death. It imposes strict liability for vessel owners, operators and bareboat charterers in the event of a spill, however, and strips defenses down to three - an act of war, an act of God, or the act of an unrelated third party. It raises the liability for owners of an average size supertanker operating in US waters to around \$100 million and includes lost profits of fishermen and reduced tax revenues of local governments as liabilities. In addition, it authorises unlimited liability if the spill results from a violation of a federal regulation or a safety standard, such as operation of a vessel while intoxicated. In addition. all US coastal states have oil spill laws which impose liability, and some of these are draconian. Despite the elimination of secondary cargo liability under the OPA, oil companies fear they will be dragged into the courts anyway, if a spill occurs.

### Effects on the petroleum industry

Most tanker owners are continuing to trade to the United States, although some refuse to carry 'persistent' oils (crude oil and less refined petroleum products) to mainland ports and either discharge their cargoes at the Louisiana offshore oil port, lighter, or transship in the Caribbean.

Most major oil companies are exerting more control over crude shipments in US waters by increased ownership of tankers, more stringent inspections of vessels for charter and closer links with independent shipowners. As a recent report by the Petroleum Industry Research Foundation noted, the United States is the preeminent source of tanker demand and is expected to have the largest growth in volume terms during the 1990s. Approximately 5,000 tankers transport oil to the United States and most of these will continue to do so because there is no conceivable alternative. Whether there will be a catastrophic spill in US waters which causes severe damage, despite the precautions now being taken, is unpredictable. If that should happen, the financial effect on shipowners, bareboat charterers and cargo owners is equally unpredictable. Federal and state laws concerning liability are ambiguous and it is difficult to foresee the consequences of a spill until a case lands in the courts. Judges have so much leeway in their interpretation of laws that the fate of those involved in a spill could be in their hands.

### VLCC replacement: the question is 'when' not 'whether'

By B T Martin, Director, EA Gibson Shipwise Ltd

Today's instant media coverage of disasters means that such events are seen around the world within minutes. The dramatic last hours of the laden oil tanker *Braer* before she was lost on the rocky Shetland coast was such an occasion. A month before the World had seen the loss of combined carrier *Aegean Sea* before discharging cargo at La Corunna on the Biscay Coast of northern Spain. More recently the collision between two tankers off Malaysia/Indonesia resulted in fire and a significant oil spillage and pollution. Together these three incidents resulted in the loss of approximately 200,000 tonnes of oil, most of which entered the marine environment.

To a certain extent there is no common cause in these incidents. Breakdowns are in probability terms inevitable. Similarly weather conditions are inescapable. More significantly there may be fundamental issues that underly the total oil shipping industry which have and will continue to adversely contribute to the performance of safe and efficient oil transportation by sea.

Future students of maritime economics and shipping historians will probably write a few chapters, if not books, on the current period in the progress of long haul seaborne oil movements. As an analyst who could be accused of watching the game rather than being one of the players, it appears that some of the sins of the fathers could easily be revisited on their sons.

For the tanker industry the next few, possibly five, years will mark the end of an era in bulk oil shipping. The age statistics relating to the VLCC fleet have been unambiguously clear and indicate that if reliable and safe crude oil trans-portation is to continue most of the fleet needs to be already scheduled for replacement, with ordering taking place accordingly.

The tanker industry appears to be lacking any sense of urgency over the situation that requires unprecedented levels of capital investment This fact is perhaps not surprising for a number of basic reasons.

Owners of tankers and charterers who utilise the vessels have been through a period of at least 15 years when there has never been a shortage of larger tanker capacity. In fact today's market is as near to the supply/demand balance as can be achieved. This should be contrasted with mid-1983 when VLCCs and ULCCs totalling over 60 million deadweight tonnes were laid up or idle.

The first generation of VLCCs as well as being a significant technological development were attractive as a means of providing lower transportation costs through economies of scale. Unfortunately this sort of benefit is a one-off. While accepting the next generation will secure some lower operating costs, the fully built-up vessel cost will be higher than ever before because of the very high capital costs of the new ships.

The benefits offered to charterers at a time of rising absolute and tonnemile demand in the 1970s made the acquisition of large tankers a virtual necessity for any owner who had a long-term commitment to the tanker market. This was equally true of marine divisions of the oil companies, particularly the major multinational ones. On the basis of oil industry demand forecasts a fleet of VLCCs was essential. The oil industry convinced itself that demand would continue to rise indefinitely and the shipping and banking communities were willing to exploit the situation. Metaphorically, the

'information pumps' were performing well, the valves controlling the rate of vessel ordering and shipyard output had been fully opened by the providers of credit finance but no effective control existed to moderate the flow of new orders. Consequently, even without the 150 percent increase in crude oil prices during 1979-80, the tanker industry was headed for a disastrous oversupply of ships. Ultimately, the position was aggravated by the trend of falling oil demand which was not reversed until 1987.

Regrettably, I believe, both sides of the tanker industry are still living with management policies born during the traumatic first half of the 1980s. For example, it must be difficult for oil company managers to propose reinvestment to their boards, when everyone remembers seeking board approval to scrap modern tonnage less than a decade ago. Until recently the investment valve has been so securely closed that one might feel that it would be reckless to start to open it again.

#### Age structure

When the age structure of the VLCC fleet is examined, some very poignant features emerge. Today's VLCC fleet, that is vessels in the 200-299,999 dwt size range, totals 95 million dwt. Half of these were delivered during the three-year period 1974-76. Four

percent of the vessels are over 20 years old and 73 percent are over 15 years old and clearly the age profile is skewed and top heavy with old vessels. The most favourable comment that can be made must be that 16 percent were delivered during the last five years.

For the record, aggregated scrappings, losses and conversions of VLCCs have totalled over 86 million dwt. The peak year for tanker demolition was 1985 when for a period of a few months on average a VLCC was sold for scrapping every other day! Undoubtably most of the scrapping was technically premature, albeit an economic necessity. There was no way the market could have absorbed or employed such an over expanded fleet.

The fact that so many ships had to be removed, makes estimation of the likely life of existing ships problematic. It is often stated that tankers have a design life of 20 years. In reality, as illustrated, there are at least 16 VLCCs trading which are over 20 years old, and in five years time if no scrapping takes place the figure could be about 270.

#### Varying factors

How long an owner will be prepared to maintain and operate his vessel depends on several technical factors which will eventually lead to a commercial decision. It is recognised that no two ships are alike as any surveyor or marine superintendent can testify. When one accepts that many different shipyards built vessels, using a variety of designs, types of propulsion, makes of engine and equipment, the individual ship's potential for continued trading depends on the standard of upkeep and maintenance applied by the owner throughout the ship's life. Many older ships may have changed owners on several occasions, which in turn raises questions about the continuity of the ship's management. Similarly the long-term impact of periods of extended lay-up needs to be assessed.

It should be concluded therefore that neither age nor any other single factor alone is going to cause vessels to be committed for demolition at a stroke but the fact that such a high proportion of the fleet is of the same age, the probability is that many of the existing VLCCs are going to need replacement at around the same time.

The most significant factor for any owner to consider is at what point the vessel's expected future earnings fall below the basic operating cost. In a



#### The real cost comparison 1970-1992

straight forward world this would simply be a matter of comparing the spot rate earnings level with the costs. Unfortunately it is no longer sufficient only to compare costs and revenues. Owners have to make assumptions about how many days a year they can realistically expect to be on hire. If vessels are only expected to trade for say 60 percent of the year, then they are going to need freight rates 67 percent above the breakeven rate when they are trading. Any owner with a ship known to be near the end of her economic life will obviously have a lower cost structure, as the vessel will be fully amortised and capital costs will no longer pertain. Provisions for dry docking and major repairs may also be absent from the individual vessel's budget. One cost which is growing in real terms is P & I contributions but this is not peculiar just to old vessels.

#### Vetting procedures

In the absence of port states imposing an absolute age limit on vessels allowed into their ports, owners can be expected to trade their tankers as long as they are expecting to make a positive financial contribution. Vessel employment will depend on two main factors. Firstly, whether there are too many vessels available for charter regardless of the amount of cargo to be carried. Secondly, how attractive or acceptable the individual tanker is to the charterer. Increasing sophistication is being included in the methods of ship vetting and the major charterers first-hand knowledge of the ships they have utilised or inspected prior to a charter is growing. Without actually designating a ship as substandard (albeit without the existence of a standard) charterers are able to exercise preferences among vessels offered for charter by owners on the basis of technical considerations. This approach is clearly preferable to earlier attempts at negative vetting on the basis of 'safety' rankings published by organisations monitoring published casualty reports.

#### Scrapping decisions

The timing of the decision to scrap vessels approaching the end of their economic lives may be precipitated by one or more other factors. For example when an owner is faced with the need for repair work to be carried out as a result of a breakdown or collision damage, the decision to scrap could ensue. Finally, owners facing the need to dispose of any ship will be aware of the movements in demolition market prices, in order to obtain the highest price from the breakers.

It can be concluded therefore that the removal of old VLCCs is likely to be a steady and relatively undramatic affair in the early stages, more or less keeping pace with the delivery of the 75 vessels scheduled for delivery by 1995. Beyond that point the situation will become serious and possibly critical.

On the basis of the foregoing analysis, if all the existing fleet survive to 1996, there will be about 270 ships at or over 20 years old. However assuming 75 existing ships are replaced by the newbuildings, the industry will be composed of a fleet of approximately 370 VLCCs of which 190-200 will be at least 20 years old. The question must be whether this situation is acceptable.

#### ULCCs

This review has only discussed the prospects for the existing VLCC fleet. Additionally there are currently 87 tankers over 300,000 dwt, the ULCC's, 48 of which vessels will similarly be at least 20 years old by 1996. Only 14 vessels of this size range have been built since 1980, four of which are ore/oil combined carriers. The ordering pattern over the last five years has virtually ignored the ULCC range, other than two vessels of about 305,000 dwt.

The future market role for larger ULCCs is unlikely to be significant, because since these size vessels were originally commissioned, there have been changes in the way the oil market operates. It was logical that the economies of scale were greater as ships got larger. When oil companies had greater upstream control, their problem was to transport the oil they produced to their refineries. Since the 1970s this linkage has ended. Oil companies are more commonly buying the crude oil from the producers in competition with oil traders, who also need to have ships in place to load the cargo. Partly under the influence of the oil traders producers have moved to selling oil in regular lots, such as a million barrels.

For a trader a two million barrel cargo at today's oil prices represents an exposure of about \$35 million. The numbers of traders willing to undertake, for example, a three million barrel lot is presumably a constraining factor. Two million barrels represents 270,000 cargo tonnes of oil grades like Arabian Light. Given these factors it is difficult to envisage renewed interest by owners in ordering large ULCCs.

#### Conclusion

What does all this mean for the future? In an ideal shipping world, there would have been a steady stream of investment, as in the oil industry itself, such that on the basis of the notional 20 year vessel life, 5 percent would be renewed annually. The contrast between the ideal, and the prospect of over half the VLCC fleet likely to be due for replacement by 1996, needs no comment.

The proposition that history is about to repeat itself, with the sons making the same mistake as their fathers is conceivable. The reasons may be different but the consequence of too many ships, ordered at roughly the same time, seems inevitable. When one considers whether the scenario of many owners trying to obtain new tonnage simultaneously after the middle of the decade, as well as shipbuilders providing additional capacity to meet the demand, it is reasonable to see if the damage to the future can be limited now.

It is axiomatic that owners will

invest in new tonnage if the project appears profitably secure, within the bounds of conventional investment appraisal. The most recent prices of VLCC orders placed with the main Far Eastern yards range from \$95-\$120 million, depending on the type of hull design and the \$/Yen parity. To justify an investment of such magnitude and allowing \$10,000/day for operating costs, from say 1994 onwards, owners require a time charter commencing at \$60,000/day, for a period in excess of 10 years.

Hitherto the major oil companies, which have the greatest requirement for chartered tonnage, have been tardy in recognising the industry's need for a modern fleet in the foreseeable future. Paradoxically many oil companies are neither recognising ship owners' positions in respect of the need of secure income for at least half of a new ship's life nor are they giving signs to the market that they are prepared to invest on their own account. In fact, since the Exxon Valdez oil spillage incident in 1989, oil companies have overall reduced their share of the supply of tonnage. Such negative indicators imply that a higher percentage of the next generation of VLCCs are going to be provided by independent owners raising the finance from a banking system which bore much of the losses in the last tanker crisis and which has felt the impact of the generally depressed conditions in the world economy. In simple arithmetic, if 200 new VLCCs are to be supplied in the second half of the decade at \$100 million each, over a short period of about five years, the total investment would be \$20 billion for one shipping sector alone. The price will have to be paid, both in money and opportunity cost terms, that is, the money required for VLCCs will be at the expense of other

#### VLCC fleet: past, present and future

investments and possibly with a ripple effect on interest rates in the few countries' economies large and robust enough to provide the finance.

#### End of an era

The argument that we are at the end of an era will be demonstrated by one further change, namely that the days of very cheap long-haul oil transportation are numbered. Over the last five years the cost of shipping a barrel of oil from the Middle East Gulf to Rotterdam in VLCCs chartered on the spot market has fluctuated around the \$1/barrel mark. For three of the months in 1991 the rate exceeded \$2/barrel but by December it was as low as \$1.07/barrel. The year 1992 saw a further deterioration. Tanker owners' average earnings last year were about 92cents/barrel; less than 5 percent of the price of the crude oil and less than 1 percent of the pump price of the final product.

The high rates were attributable to high demand for tonnage, the high cost of bunkers and insurance supplement, prior to the UN cease- fire with Iraq, and during the brief period when some 70 VLCCs were employed to store surplus oil production from Saudi Arabia and Iran. These cases were clearly exceptional.

The charterers' ability to obtain tonnage at universally low rates will change. Owners will not be able to trade their new vessels at today's rates.

The timing of this change is the key to the industry's and possibly the environment's future. In the current tanker market VLCCs are able to earn about \$22000/day which is less than 40% of the full cost of owning and operating new or recently built vessels. Such conclusions must beg the question: who will society demand answers from if the potential pollution from very old large tankers continues apace with recent spillages?





#### The Institute of Petroleum

### **Background Courses**

#### Introduction to Oil Industry Relations Wednesday 23 June – Friday 25 June 1993

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

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

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

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- The Retail Market
- Refining

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

#### Introduction to Petroleum Economics Monday 28 June – Wednesday 30 June 1993

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

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

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

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

### Launch of floating storage

A Floating Storage Unit (FSU), constructed for the Alba field in the North Sea, was launched last month in the Ferrol estuary in northwest Spain.

Mrs Isobel Smith, wife of Mr Charles Smith, Managing Director of Chevron UK Ltd and IP President, pressed the button which broke the traditional bottle of champagne against the side of the FSU before it slipped into the calm waters of the estuary. The day and the time of the launch were carefully chosen to take advantage of the depth of water during spring tides.

Chevron UK is the operator on the Alba field, situated 130 miles northeast of Aberdeen. First production from the first phase of the project is scheduled for the end of this year.

The innovative FSU, costing £70 million, has been built at the shipyard of Astano, part of the Astilleros Y Talleres de Noreste SA group. After the launch local sea trials of two to three weeks are planned followed by further commissioning and fitting out. Delivery is expected at the end of July when the vessel will be towed to its location in the North Sea where it will be permanently moored some 3 kilometres from the Alba Northern platform in 138 metres of water.

This 125,000dwt FSU is receiving considerable attention because it is the first of its kind to be purpose built for operating in the UK sector of the North Sea. It has very specific features designed to allow it to operate in the North Sea and to withstand 100-year storm conditions.

It is intended that it should remain on station for 15 years.

The FSU is a floating storage vessel - though vessel is perhaps a misnomer. Though resembling a conventional tanker (with the addition of a helideck) it has no means of propulsion except a stern thruster which is solely for emergency manoevring purposes. Tugs will be required to move it into place where it will remain fixed, as the mooring system does not allow for any disconnection.

Crude will be pumped from the FSU via a giant 16 in diameter hose pipeline to a dedicated shuttle tanker, moored astern. The FSU storage capacity will be 825,000 barrels of crude. While maximum throughput into the FSU is 125,000b/d, production from Alba during its first phase is not expected to exceed 70,000b/d.

The double-hulled shuttle tanker, at present under construction in Japan. will arrive every five or six days to load roughly one week's production for carrying to refineries in northwest Europe. The shuttle will be operated by Statoil on a contract of affreightment — if the dedicated tanker is not required for Alba, Statoil will be entitled to use it elsewhere. The advantage of the link with Statoil is that the company has other compatible tankers with the same loading system which could be used if the need arose. The tanker is expected to be used exclusively for Alba for five to seven years. Subsequently there will increasingly be spare capacity unless more oil is found.

Mr Pierre Diel, FSU Construction Supervisor, Alba Project, Chevron UK, said that the Astano yard was on target to complete construction on schedule. The design and construction had been to a very high quality standards; it was designed for a fatigue life of 20 years, the estimated life of the Alba field.

Accommodation incorporating the relevant recommendations from Lord Cullen's Report has been provided for 56, though the crew is likely to be 20 or fewer. Spare accommodation could be used for platform personnel. The whole accommodation block is protected by a H120 fire-rated bulkhead, which is both fireproof and blast proof, creating a Temporary Safe Refuge (TSR). Other Cullen features include the lifeboats which are Totally Enclosed Motor Propelled Survival Craft (TEMPSC).

A lot of interest has been shown in the mooring element of the FSU the only other system in use that is similar is at Huizhou in offshore China, belonging to AGIP, Chevron and Texaco. The mooring system for the Alba FSU was designed and built by Single Buoy Moorings Inc of Monaco as a separate contract. It is a rotating bottom mounted internal turret which will be anchored by 12 chain and wire rope mooring lines to piles in the seabed. Located forward of the storage tanks, the system allows the FSU to 'weathervane' freely, thus minimising the effect of wind, wave and current forces on the hull.

Drafting of the safety case is currently being carried out prior to submission in November. The FSU will represent one section of the joint safety case for the whole field. Some problems are being encountered because regulations do not exist specifically for FSUs and are being discussed with the HSE. The FSU is classed as an offshore installation.

Mr Seamus O'Connor, Loading Systems D &C Manager, Alba Project, said that this FSU might set standards for those coming after.

#### **Carol Reader**



### UK 1993 budget commentary: some will win and some will lose

By Malcolm Naylor, Tax Partner, Arthur Andersen Energy Group

 $\mathbf{F}$  or a number of years now the oil industry has been asking for a relaxation of the upstream oil tax regime. Well, it finally got its way, but at a cost – exploration activity will be more expensive. In what is the most important budget for the oil industry since Petroleum Revenue Tax (PRT) was introduced in 1975, the Chancellor has announced a major overhaul of the 'anachronistic' PRT system and has abolished it for 'new' fields altogether. More on this later.

What else is significant? Motoring continues to attract a higher tax burden. Reforms on company car taxation and higher excise duties will take their toll on downstream margins. The 'headline' news announced was of course the phased introduction of Value Added Tax on domestic supplies of fuel and power. The gas industry has already expressed its dismay. But the news is not all bad; the Chancellor of the Exchequer said he is 'not convinced' of the wisdom of introducing an EC wide energy tax. The Advance Corporation Tax (ACT) reforms and proposals to reduce the burden of surplus ACT should find favour with some.

#### Proposals

But what of the changes to the PRT regime? By now, most will be aware of the details. The key question is who wins and who loses?To briefly recall, the Chancellor proposes:

- A reduction in the PRT rate to 50 percent for chargeable periods ending after 30 June 1993.
- The abolition of PRT for fields given development consent (Annex B) on or after 16 March 1993 (Budget Day) – destined to be known as 'new' fields or 'nontaxable' fields.
- The abolition of Exploration and Appraisal (E&A) relief for expenditure incurred on or after 16 March 1993; except where the expenditure is both necessarily incurred under contracts signed before Budget Day and incurred before 16 March 1995; at least

E&A expenditure incurred before Budget Day but not yet claimed will continue to attract relief.

• Cross field allowances (CFA), whereby 10 percent of field development costs can be transferred to another field to relieve its PRT profits, will not be available from expenditure on 'non-taxable' fields.

#### 'The key question is who wins and who loses?'

• Tariff receipts will only be subject to PRT if received by a taxable field. They will only qualify for tariff receipts allowance if, in addition, they are paid by a taxable field; this could significantly impact the increasing pattern of sharing assets in the North Sea – the economics of tariffing in, say, the Southern Gas Basin could be altered dramatically.

• There are no changes to oil allowance or the ring-fence Corporation Tax (CT) provisions.

This is clearly a massive change and is a direct response by the government to the falling take from the North Sea and perhaps to the predicted cost of abandonment. UK Continental Shelf field economics have changed overnight and all upstream companies will be frantically re-evaluating existing fields, the after-tax cost of exploration budgets and the economics of new prospects.

Arthur Andersen Petroleum Services have projected that the UK oil and gas industry is set to suffer a £700 million setback over the next three years, assuming inflation at the higher end of the Chancellor's assumptions. They predict a cashflow benefit before E&A expenditure of  $\pounds$ 1.7 billion over this period but at a potential cost of  $\pounds$ 2.4 billion from the removal of E&A relief.

There appears to be a clear tradeoff of benefits between mature and new fields, and the Chancellor is taking a gamble that the benefits to the one will be used for the good of the other. Mature fields are likely to have an extended field life (as the profit on marginal barrels is increased) and improved cashflow. Previously, the UK tax regime effectively forced companies to reinvest cashflow into exploration; this will now be discretionary and exploration could again become a high risk, high reward business.

#### **Rising exploration costs**

For many the effective cost of exploration will rise from 17p in the pound to 67p.

Will this stifle exploration activity? That remains to be seen; but there is no doubt that the United Kingdom will now have to compete with emerging oil rich areas for exploration funds on an international basis.

Those who have always evaluated exploration activity on a pre-tax basis can now be grateful. Companies heavily involved in mature fields are likely to benefit but some smaller independent E&P companies may have good reason to be aggrieved. Not only is the abolition of PRT on new fields not such a give-away (many new fields would probably never pay PRT anyway because of oil allowance) but also many such companies will have committed to a certain level of exploration activity under the terms of recent licensing rounds and will not now get the anticipated relief.

#### 'This is clearly a massive change'

The proposed changes are a bold move by Mr Norman Lamont; the question is was it the right one? One thing can be said with certainty – the PRT compliance burden is set to fall, although data collection lives on as market value information will still be needed to build the Oil Taxation Office databases, and for CT purposes.

#### Downstream

Excise duty on all hydrocarbon oils

has increased by 10 percent (ie 15p on a gallon of leaded petrol and 12.5p on unleaded) and the definition has been extended to meet EC standards. It will now include Orimulsion, nonhydrocarbon motor fuel additives and biofuels. The Chancellor has also given a commitment to increase these duties by at least 3 percent in future years as a means of limiting carbon dioxide emissions.

#### 'Will this stifle exploration activity?'

Vehicle Excise Duty is to rise by £15 to £125. The long-awaited proposals for reform of company car tax benefits has arrived. From 6 April 1994 the taxable benefit scale charge will be 35 percent of the manufacturer's list price, with discounts for substantial business mileage. In the meantime, the scale charges rise by 8 percent. Combined with the 20 percent rise in scale charges for private use fuel and the abolition of 50 percent relief against the fuel benefit for those who drive in excess of 18,000 miles annually on business, the burden on the motorist is higher than ever.

### Tax on domestic fuel and power

The phased introduction of VAT on the supply of domestic fuel and power has caused a political storm. VAT will be charged at 8 percent from 1 April 1994 and at 17.5 percent from 1 April 1995. A wide range of energy businesses will be affected – suppliers of electricity, gas, coal and other solid fuels, heating oils and heat or air conditioning. Conventional wisdom has it that when the price goes up, demand falls. The industry can only hope the theory is wrong.

#### Other changes

A few other matters of general application should be mentioned. Employees' National Insurance Contributions are set to rise by 1 percent from 6 April 1994, reducing take-home pay. This is equivalent to a 1 percent increase in the basic rate of income tax for all employees earning less than the NIC upper earnings limit (£420 per week from April). On top of this, personal allowances and the Married Couples Allowance have been frozen at their current levels (with the latter only attracting 20 percent relief from April 1994). Not good news for the lower paid.

There were the usual Budget-time amendments closing 'loopholes', 'tax schemes' and other 'opportunities'; in particular, restrictions on buying ACT capacity and capital loss companies and an extension of the Controlled Foreign Companies (CFC) legislation.

Reform of the taxation of dividends and ACT has been announced. The rate of ACT is to be 22.5 percent in 1993/94 and 20 percent in 1994/95. The maximum set off of ACT against a company's mainstream CT liability will be reduced accordingly and the tax credit available to shareholders will be reduced to 20 percent. When seen together with the consultative document issued on surplus ACT arising from dividends paid out of foreign source income, it finally looks as if the Chancellor is going to make inroads into the 'surplus ACT problem' something which, as he pointed out, has eluded his predecessors.

'The phased introduction of VAT on the supply of domestic fuel and power has caused a political storm'

However, not everyone will be happy; one knock-on effect of the change is that the effective rate of UK tax will increase for overseas shareholders who currently enjoy a partial refund of the tax credit on dividends, for example US parent companies. UK higher-rate tax payers who invest in equities will also be worse off. In effect they will be bearing part of the cost of reducing the ACT burden. And something which the major institutional investors have not been slow to highlight is that tax exempt investors (eg. pension funds) will find the yield on equities reduced.

And finally, a word of caution to all those companies with 31 December year-ends who have not yet finalised their accounts; adjustments to deferred PRT provisions may be in order. However, as all these involved in accounting will know, only 'material' events require a change to the accounts.

Long live materiality!

### FORTHCOMING EVENTS

#### April

#### 1st

Aberdeen: 'Offshore Safety Cases'. Details: IAS 5, HSE, Room 414, St Hughes House, Bootle L20 3QY. Tel: (051) 951 4225.

#### 1st

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

#### 1st-2nd

London: 'Energy Industry in Eastern Europe and Former Soviet Republics'. Details: Patricia Matthews, DRI/McGraw Hill. Tel: (081) 545 6212.

#### 3rd-6th

Bahrain: '8th Middle East Oil Show & Conference'. Details: Stephen Key, Arabian Exhibition Management, PO Box 20200, Manama, Bahrain. Tel: (973) 550033. Fax: (973) 553288.

#### 5th-6th

London: 'Oil Production Capacity: Investments, Relationships and Policies'. Details: Centre for Global Energy Studies, PO Box 5, Kirkby-in-Ashfield, Notts NG17 7JG. Tel: (0623) 722213. Fax: (0623) 722216.

#### 5th-7th

Aberdeen: 'Monitoring Hydrocarbons and Oil Field Chemicals in the Environment'. Details: Dr R Large, M-Scan Limited, Silwood Park, Sunninghill, Ascot SL5 7PZ. Tel: (0344) 27612. Fax: (0344) 872709

#### 17th-20th

Bahrain: 'Offshore Pipeline Engineering Course'. Details: Sarah Peace or Nadia Ellis, IBC Technical Services Ltd. Tel: (071) 637 4383. Fax: (071) 631 3214.

#### 20th

London: 'Fuels for Power Generation'. Details: Conference Department, Institute of Energy, 18 Devonshire Street, London W1N 2AU. Tel: (071) 580 0008. Fax: (071) 580 4420.

#### 20th-21st

Manchester: 'Advances in Process Technology'. Details: BHR Group, Cranfield, Bedford MK43 0AJ. Tel: (0234) 750422. Fax: (0234) 750074.

#### 22nd

London: 'Improving Navigation for Seismic Acquisition and Processing'. Details: Themedia, PO Box 2, Chipping Norton, Oxon OX7 5QX. Tel: (0608) 84888. Fax: (0608) 84796.

#### 22nd-23rd

London: 'Refinery Loss Control'. Details: Sarah Peace or Nadia Ellis, IBC Technical Services Ltd. Tel: (071) 637 4383. Fax: (071) 631 3214.

#### 24th-27th

Abu Dhabi: 'The Fourth European and Middle Eastern Pipeline Rehabilitation Seminar'. Details: Susan Carradice, Pipeline Integrity Management (PIM), The Pipeline Centre, Farrington Road, Rossendale Road Industrial Estate, Burnley, Lancashire BB11 5SW. Tel: (0282) 415323. Fax: (0282) 415326.

#### 28th

**London:** 'The Practicalities of Crew Training to Comply with new Oil Spill Contingency Planning Legislation'. Details: IIR Ltd., Industrial Division, 28th Floor, Centre Point, 103 New Oxford Street, London WC1A 1DD. Tel: (071) 412 0141. Fax: (071) 412 0145.

#### 28th-29th

Istanbul: 'Black Sea Oil & Gas: Emerging Opportunities'. Details: Verna Cappuccio, Europe Energy Environment Ltd., London. Tel: (071) 493 4918. Fax: (071) 355 1415.

#### 28th-30th

Houston, Texas: 'Oil & Gas Production-Sharing Contracts (PSCs), Concessions & New Petroleum Ventures in the Asia-Pacific Basin'. Details: Institute for International Research, 437 Madison Avenue, 23rd Floor, New York, New York 10022 U.S.A. Tel: (212) 826 1260. Fax: (212) 826 6411.

#### 29th

London: Conference on 'Petroleum Retailing: Environment, Regulation and Profitability'. Details: Miss Caroline Little, The Institute of Petroleum.

#### 29th

London: 'Integration of Diverse E-Mail Systems -Developments in Products and their Interoperability & Integration'. Details: Dipti Chauhan, IBC Technical Services Ltd. Tel: (071) 637 4383. Fax: (071) 631 3214.

#### 29th

Aberdeen: Offshore Management: 'Managing Offshore Safety'. Details: Evelyn McLennan, Offshore Management Research Group, Robert Gordon University, Viewfield Road, Aberdeen AB9 2PW. Tel: (0224) 208 887. Fax: (0224) 208 947.

#### May

#### 3rd-6th

Houston, Texas: '25th Offshore Technology Conference'. Details: OTC, 4 Mandeville Place, London W1M 5LA. Tel: (071) 487 4250. Fax: (071) 487 4229.

#### 4th-6th

Aberdeen: 'Risk Analysis for Safety Cases – Workshop'. Details: Sarah Peace or Nadia Ellis, IBC Technical Services Ltd. Tel: (071) 637 4383. Fax: (071) 631 3214.

#### 5th-6th

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

Tel: (0608) 50831 ext 282 Fax: (0608) 51788

#### 5th-7th

**Birmingham**: 'Performance Evaluation of Automotive Fuels and Lubricants'. Details: National Exhibition Centre, Birmingham B40 1NT.

Tel: (021) 780 4321. Fax: (021) 780 4260.

#### 5th-7th

Manchester: 'Developing Corporate IT Strategies'. Details: Dipti Chauhan, IBC Technical Services Ltd. Tel: (071) 637 4383. Fax: (071) 631 3214.

#### 10th-11th

Cambridge: 'Complying with Environmental Legislation – A Pratical Course for Non-Lawyers'. Details: Elaine Hendry, Cambridge Programme for Industry, 1 Trumpington

Petroleum Review April 1993

### FORTHCOMING EVENTS

Street, Cambridge CB2 1QA. Tel: (0223) 302233. Fax: (0223) 301122.

#### 10th-13th

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

#### 11th

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

#### 11th-13th

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

#### 12th-13th

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

#### 12th-14th

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

#### 13th

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

#### 13th-14th

London: 'Local Area Network (LAN) Security'. Details: Amanda Stuart, IBC Technical Services Ltd. Tel: (071) 637 4383. Fax: (071) 631 3214.

#### 17th-19th

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

#### 18th-19th

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

#### 18th-20th

London: 'Developing Corporate IT Strategies'. Details: Dipti Chauhan, IBC Technical Services Ltd. Tel: (071) 637 4383. Fax: (071) 631 3214.

#### 19th

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

#### 19th-21st

Maidenhead: 'Economic Modelling on PCs for the Oil and Gas Industry'. Details: Langham Oil Conferences Ltd., 37 Main Street, Queniborough, Leicester LE7 3DB. Tel: (0664) 424776. Fax: (0664) 424832.

#### 19th-21st

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

#### 20th

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

#### 20th-21st

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

#### 24th-25th

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

#### 24th-25th

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

#### 25th-26th

London: Conference 'Update '93'. Details: Petroleum Training Federation, Marley House, 314-322 Regent Street, London W1R 5AB. Tel: (071) 255 2335. Fax: (071) 255 1828.

#### 25th

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

#### 25th-26th

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

#### 26th-27th

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

#### June

#### 3rd-4th

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

#### 8th

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

#### 8th-9th

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

### Major terminal up-grade

By N H Jones, Senior Project Engineer, Texaco Ltd.

Kingsbury Terminal was opened in 1969 and occupies nearly all of a triangular piece of land, measuring approximately 21 acres. The terminal receives refined petroleum products by pipeline and distributes to dealers and company-owned filling stations by truck. It is located in a semi-rural area of Staffordshire north-west of Birmingham and serves a large area in central England as well as the Birmingham metropolitan areas.

The terminal serves as a direct outlet for Texaco's Pembroke refinery where product enters the Mainline Pipeline system. Texaco is a partner in this pipeline system, which includes a 16 inch main route to Seisdon, some 32 miles west of the Kingsbury terminal. At the Seisdon station, which has administrative offices and pipeline controls, the system splits and a 12-inch branch continues eastward, supplying other terminals before reaching Kingsbury. From Kingsbury, this branch continues as a 10-inch pipeline and terminates at Nottingham in the east and Manchester in the north.

Products also reach the terminal from the Esso refinery at Fawley. located on the south coast of England. A 10-inch line of the UKOP system of the British Pipeline Authority brings products to several terminals in the area. UKOP-owned pumps are also used to transfer product to the North London terminal of Hertfordshire Oil Storage Ltd (HOSL) in which Texaco has a 50% interest. Thus, the Kingsbury terminal serves as an intermediate storage point as well as providing storage for local distribution. Aviation is also exported via the UKOP system to Heathrow and Gatwick airports.

Texaco handles seven products at this location:

- 4 Star (98 octane leaded gasoline)
- Super Unleaded Gasoline
- Unleaded Gasoline (92 octane)
- DERV (diesel engine road vehicle)
- Avtur (jet fuel)
- · Gas Oil (No 2 fuel oil)
- Burning oil (kerosene for No 1 fuel oil)

In addition to saleable products, the terminal stores pipeline interface material in three small tanks (Nos 1-3) dedicated to this service.

In 1991, Supply, Operating & Trading (S.O.& T.) Engineering were instructed to implement a major project to upgrade the terminal in line with Texaco's commitment to meet and exceed legislative and safety standards.

The project was to cover a complete refurbishment of the existing top loading R.T.W. loading bays. This was to offer four new bottom loading skids, five arms on each, and one top loader double sided, 10 arms in total. The construction was to include facilities for vapour recovery at a later date. The skids were to be fabricated in the site warehouse, then in a very detailed comprehensive phased programme, installed in situ on the decommissioned top loading bases and extended new civil base areas.

Product dispatch and data capture was to follow Texaco's already well proven method using a micro-processor based system. The microprocessor would be pre-loaded with daily dispatch orders, and drivers issued with their delivery instructions would use their magnetic strip cards to obtain truck entry and exit through security barriers. Once on the loading bay, the driver would slot the card into the data entry unit and enter his P.I.N. (personal identity number). Permissionwould be obtained, enabling product to be loaded. Batch load information is captured by the micro-processor and at the end of each load a Bill of Loading is produced. All safety interlocks and pump controls interface with the system, resulting in safe, efficiently controlled and accurately monitored product loading. (See Control 'Bubble' Schematic).

Product control took the guise of electronic pre-sets controlling digital



The Institute of Petroleum

**Petroleum Review April 1993** 

control valves with turbines used on bottom loading and P.D. meters used on top loading. In addition, temperature and pressure are monitored. The whole system is built with degrade functionality with a data spooler sitting on the complete system to back up the main processor. All the loading bays were to have integrated earthing and anti-spill systems installed.

A new 12,000 tonne coned roof tank for additional unleaded storage was to be added to the 21 product tanks, the method of construction was a first for S.O.& T. To enable safe construction alongside the existing tank farm, an infra-red gas detection screen was set up to protect the construction area from any migration of combustible gases. This allowed a safe working environment for the tank fabrication. This took the format of fixed base construction. First, the floor was fabricated then top strake and domed roof. This section was then jacked up and the next strake added, this format followed for the whole construction. It proved to be a very safe and efficient construction method. All 22 tanks would have an electric valve actuation control on import and export lines via a multiplexed central control.

The terminal was to have a new electrical distribution system using a P.L.C. to control all product pump and additive sequencing. All critical equipment was to have additional protection of an Uninterrupted Power Supply (U.P.S.). Security and safety was to be covered by a sophisticated perimeter C.C.T.V. system that alarmed via motion detectors day or night. A re-vamped high efficiency lighting system with auto or manual control from central control provided a conducive environment for day and night operations. Additional protection for the whole site required a comprehensive installation, offering a totally fail safe fire protection system. This would cover the loading bays with a foam/water deluge system with 'double knock' detection protection. The tanks would have similar selectable foam blanket control, with additional water/foam cannons in critical areas of the site. The foam and water generation system was duplicated for additional failsafe protection with 'on-line' electric pumps and back-up diesel.

From the project brief, the main concerns were to ensure ease of operation for the terminal staff. While the work-scope was extensive, the terminal's operation throughout the project was not to be affected.



#### Control 'bubble' schematic

Therefore a close working arrangement was required with Operations. This was established by Engineering in the early phase of the project. This close bond with the free-flow of ideas ensured not one operational day was lost, with the project completed on schedule and on budget.

Phase II of the project is now well on the way with the refur-bished control room creating the ideal operational environment. This has been ergonomically designed for operator interface to facets of product control, assisted by engineering 'user friendly' system. Kingsbury has become a flagship for Texaco operations and it is without a doubt that this was achieved with the commitment and professionalism established by S.O.& T. Operations and Engineering.



### Does your laboratory conduct cetane number tests?

#### Then why not join the IP correlation scheme?

The scheme gives laboratories the opportunity to check their engines, using the IP41/ASTM D613 test method, on a monthly basis using fuels of a variety of nominal cetane numbers, including exchange samples from the United States.

With monthly reports showing the participants' results, together with the mean values and the standard deviation, the scheme will form an important part of any laboratory's Q/A procedure.

For further details of the scheme please contact John Phipps at the Institute of Petroleum.





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### The development of the environment and the environment for development

By Hisham M. Nazer, Minister of Petroleum and Mineral Resources, Kingdom of Saudi Arabia

I would like to share with you my thoughts on the intricate relationship between the environment, energy and development. There is an urgent need to appreciate and understand the differing views on this triangular relationship before costly policies are hastily implemented.

We are all tenants of planet Earth. And we must all strive to leave the earth safer and cleaner than we found it. I am not talking here about just the physical environment. The social and political environment is as important. Man's interaction with the environment is based on a sacred trust given to us by God to respect the delicate balance of nature in the process of benefiting from it.

Protecting and nourishing the environment has been and remains an integral part of our social and economic existence. (And when I talk about the environment it is not a fashionable tribute to a newly found icon the world seems to be searching for these days.) I fear that our position on the issue is not being understood by those who are in a terrible hurry to monopolise environmental concerns, as if the rest of humanity has no concem for our common home.

It would also be counterproductive if we try to pass the blame or lecture each other about who has damaged the environment most. Whether it is the rich who have abused nature by sweeping the environmental ravages of the industrial order under the carpet of growth, or the poor who have taken from nature to survive at the cost of the environment. We cannot hope for meaningful co-operation without an understanding of each others views and underlying concerns.

What is needed is a holistic approach to the whole issue of the environment.

Selfish interests which protect one's own area or carry one's own agenda do not make sense anymore. For the Earth's environ-ment knows no boundaries and the world is truly more interdependent than ever. It would thus be futile to single out just one particular aspect of environmental degradation and just one particular cause and attack it without any concern for its global implications.

"...the views of many countries, including my own, were misunderstood, prejudged or just ignored"

I am saying this because I had occasion to observe closely how the problems of the environment were dealt with at the Rio Conference on Environment and Development last June. I witnessed first hand how fundamental viewpoints on the relevant issues of the conference were brushed aside. I was sad to see how the views of many countries, including my own, were misunderstood, prejudged or just ignored. I noticed how political constituencies and vested economic interests undermined the cause of science, balanced economic growth and the alleviation of poverty. What was needed then and is even more urgent now is a clear appreciation of the

inseparable objectives of preserving the environment and maintaining growth. This cannot be achieved without due regard for the problems and aspirations of three-quarters of the world's people living in the developing countries.

We went to Rio with an open heart and mind to find balanced solutions to the twin issues of environment and development. We participated effectively in all forums and international negotiations leading to the conference. But we were dismayed to see the issues being dealt with from the 'higher ground' of affluence. We noticed how environmental issues left the realm of science for the domain of politics and this is continuing until this very day.

Take the way the issue of nuclear energy has been dealt with recently. The insertion of the word 'safe' when speaking of the need to transfer 'energy technologies' to the developing countries has been repeatedly rejected in order to preserve the nuclear option. This is despite the known hazards associated with nuclear energy and the worldwide recognition of its looming dangers and waste. Instead, all salvos have been directed against hydrocarbons and their exaggerated contribution to environmental degradation. Even within the question of climate change and carbon dioxide, the problem of deforestation is being compromised. Attention is being focused more on reducing fossil fuel consumption than

on preserving carbon dioxide sinks.

The world is being rapidly ensnared in the maze of all sorts of bureaucracies, whether international, regional or institutional. Having spent the better part of three decades in public life, I know what bureaucracies can do to paralyse any programme and redirect it to self-perpetuation. All governments should be alert to this regressive development, otherwise we shall all be lost in the small print and red tape of environmental policies noone understands or even intends to implement in the first place.

#### Development

This brings me to the heart of the debate, namely the question of development. The World Bank estimates that more than a billion people still live in acute poverty and suffer grossly inadequate access to resources required to give them an opportunity for economic development. I would like to add my voice to the World Bank's observation that 'attacking poverty is not only a moral imperative but it is also essential for environmental stewardship'. The industrialised countries have direct responsibility in the process to help alleviate poverty and enhance world economic growth.

Abject poverty is indeed the worst environmental pollutant facing Mankind. It degrades a human being far more inescapably than carbon dioxide. The immediate struggle for basic survival by the poor of this world overwhelms the legitimate concern of environmental protection. It is all very well to talk of future generations when the stomach is full. But an empty stomach cannot think beyond the next meal.

There is a growing concern that many environmental and energy policies promoted and implemented in some industrialised countries, or undue environmental constraints imposed on the developing countries through international agreements or aid organisations, could seriously impair the developing countries' ability to sustain economic growth. It is estimated, for instance, that the developing countries would need an additional \$125 billion annually in foreign assistance alone in order to improve their environment. The sad part is that the developing countries' do not have enough resources and the rich countries are not willing to foot the bill.

The danger here is that the emerging ideology of 'Environmentalism' could

impose dead ends on the already difficult path of economic growth for the majority of the world's people. There can be no development of the environment without simultaneously creating the environment for development. I cannot think of any means to bring about global economic development without the use of energy, especially oil.

Oil is the elixir of the industrial civilisation or what Daniel Yergin calls the era of the 'Hydrocarbon Man'. The policies designed to curtail the use of energy, or affect the energy mix through command and control policies or fiscal measures in the industrialised countries, will affect growth and undermine development objectives. Our concern is that the anti-energy and anti-oil bias of policies promoted under catch words like 'no-regrets' will end up weighing heavily on the developing countries and on the future generations, and will be finally regretted.

'The policies designed to curtail the use of energy, or affect the energy mix through command and control policies or fiscal measures in the industrialised countries, will affect growth and undermine development objectives'

The idea of insuring against the risks of some phenomena of uncertain future consequences should be weighed against the risks of taking costly policies, including the promotion of nuclear energy, the dangers of which are known today. There is still scientific uncertainty with respect to the timing, magnitude and pattems of climate change. Such uncertainty is recognised in the scientific assessment of the United Nations Intergovernmental Panel on Climate Change (IPCC). And while there is an explosion of knowledge in that field, there is general agreement that continued research is needed to reach an objective assessment of the causes and effects of climate change.

And while the scientific jury is out, there is no need to rush into costly policies. We can argue for ever about greenhouse gases, fossil fuels, climate change and all that; but I would rather talk about the things we should all agree on. They are: creating a healthy environment for economic growth and development and creating the atmosphere for stability and predictability in the oil market. Taxing energy or oil under different forms, be it carbon taxes or energy taxes or import fees or some combination of these, does not help achieve these goals. Such taxes whether for environmental motives or efficiency gains or protecting domestic production or merely budgetary reasons, often sacrifice the underlying objective of economic growth. They could even run afoul of their very objectives.

#### Effectiveness

Many studies have questioned the effectiveness of carbon taxes in reducing carbon dioxide concentrations, or the effectiveness of import fees in stimulating domestic production, or the effectiveness of taxes in fostering efficiency. The rationale is that such taxes operate through the price mechanism and give appropriate market signals to cut consumption and clean the environment. But the fact of the matter is that energy markets in most of the industrialised countries and especially in Europe are far from perfect. Further taxes would aggravate such market imperfections.

The discrimination against oil in many of these countries has reached a point where taxes on the barrel of petroleum products is three to four times the price of a barrel of crude while coal, which emits more carbon dioxide than oil per unit of energy, receives generous subsidies reaching \$105 a ton in Germany and Japan. Had such petroleum taxes or coal subsidies been re-adjusted according to an environmental criteria and not merely a budgetary objective, the world environment would be cleaner without constraining growth and the final consumer would be paying less at the gasoline station.

Our calculations show that the implicit carbon tax on oil prevailing today in the United States is around \$100 a ton of carbon and in the European Community \$450. If such implicit carbon taxes on petroleum products were restructured to account for the carbon content of each fossil fuel, then without further taxation the C02 emissions would be reduced in the OECD by 12 percent which is higher than the three percent reduction stipulated in the European Community's carbon tax proposal. If the subsidies on coal are to be phased out, emissions could be reduced even

further. But unfortunately, immediate fiscal concerns and narrow political interests often outweigh the environmental objective which is increasingly being hijacked by the ideology of 'environmentalism'.

I do not want to take anything away from the ongoing scientific debate on the effect of fossil fuels on the environment. What I am certain of is that oil has been made the culprit. A celebrated recent study by an established environmentalist group argued in vain that the world can do without oil. The title of the study tells it all: 'Energy without Oil'. I am also certain that oil has been taxed far in excess of any contribution it may have in environmental degradation. And I am also certain that the cost of different policies to forcefully reduce the consumption of oil on world economic growth is enormous and their ultimate effect on the world oil market is de-stabilising. For the basic assumption is the normal growth in oil demand in line with economic growth. If demand is deliberately suppressed, then it would not be surprising if oil producers reassess the compatibility of their polices with the evolving policies and trends on the demand side.

This brings me to share with you the perspective of an oil producing developing country like Saudi Arabia. The negative policy trends on energy and environment I have outlined are indeed alarming. Saudi Arabia is a major stabilising force in the oil market. We have endeavoured over the years to assure the world of secure oil supplies and stable prices. We are investing billions of dollars to increase our production capacity to assure the world of adequate supplies in the years ahead. We are building a state of the art shipping fleet to guard against oil spills. We are upgrading our refineries to supply a cleaner barrel to the market. We are investing in downstream joint ventures all over the world to develop an integrative process which will add to both security and stability.

We used the revenues from oil to develop our economy and improve the standard of living of our people and to aid the developing countries. Saudi Arabia's official economic assistance is second to none. Our total aid flows to the developing countries over the last two decades amounted to \$67 billion constituting on average 5.5 percent of our GDP. Compare this to 0.7 percent of GDP recommended by the United Nations and seldom reached by the richer industrialised countries. And who is oil rich and oil poor? In 1991 the revenues of the developing country oil exporters from the export of 11.6 million barrels per day amounted to \$70 billion, while the countries of the European Community collected in the same year \$222 billion in taxes on petroleum products from the consumption of the same 11.6 million barrels per day.

Given the role of Saudi Arabia in the world of oil, it is not very helpful to see the industrialised countries implementing one policy after another to undermine international oil trade and consequently market stability. We see constant discrimination against oil in many policy measures and initiatives under the pretext of security of supply or the guise of environmental protection or simply alleviating budget deficit. The final consumer in the industrialised countries is being made to suffer from the 'petrophobia' of policy makers.

Another disturbing development in the long list of taxes on energy and oil is the proposed oil import fee under the pretext of protecting domestic production. I thought that the world had suffered enough from the perils of protectionism and realised the merits and advantages of moving towards a more liberalised trade regime. Erecting more barriers to oil trade by way of import tariffs and the like run contrary to the principles of GATT and it defies the logic of geology and economics. Such tariffs would not significantly alter the prevailing supply pattern. It would further aggravate dislocations within the economy and foster inefficiencies. And I do not see why US oil imports valued at \$42 billion should be of special concern and require undue protection any more than other imports like cars which are valued at \$58 billion. For us as a major oil exporter to the United States and a reliable supplier as well as a longtime friend, such an import fee would harm our exports and downstream investments.

In closing let me assert a fact which often escapes many. Oil will be with us for a very long time. It is what some described as the bridge fuel to the future. It is cheap, clean and safe. We have it, the world needs it. So why penalise this precious gift of God at the expense of the welfare of the people of the world.

This paper was first presented at a conference organised by Cambridge Energy Research Associates in Houston, Texas.



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



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### Thinking the unthinkable

Report of a meeting of the IP Northeast Branch, held on 27 January, addressed by Mr P Taylor, Cleveland Emergency Planning Officer.

The Braer tanker wreck on the Shetlands has focused attention on the price we have to pay for commodities like crude oil without which our society as we know it could not exist.

We say that it could not happen here in Cleveland and yet, unknown to the ordinary 'man in the street', 20 million tonnes of hazardous chemicals arrive and depart at the Port of Tees and Hartlepool each year. The source of much of this area's wealth could also, wrongly handled, cause a far greater disaster than ever could be imagined. The Phillips petroleum facility on Seal Sands is the end of the approximately 300 kilometre Ekofisk pipeline. This is expected to handle, process and tranship some 55,000 barrels of Norwegian crude per day this year.

Our boundaries include major chemical works, pipelines and a nuclear power-station. The potential for the unthinkable to happen is infinitely greater than on the Shetland Isles. It is testament to the professionalism and expertise of those charged with the management and operations of these and other installations in our midst that over the past 17 years, while Mr P Taylor has been Emergency Planning Officer for the county of Cleveland, all incidents have been minor in nature and no catastrophe of any size has taken place.

It must be remembered also that these installations are strictly controlled under Health and Safety at Work legislation. Plans have to be filed for the likely form and extent of any conceivable emergency that might arise from these operations under the Control of Incidents arising from Major Accident Hazards legislation which was passed in the wake of the Seveso disaster in Italy.

#### **Emergency planning**

Mr Taylor and his team spend their days thinking through the provisions to be made in the wake of a major disaster within the county. The result is the County Emergency Plan drawn up with industry, the emergency services, voluntary bodies such as the St Johns Ambulance and the district local authorities as well as central government.

This plan gives details of the actions to be taken in the event of foreseen accidents or catastrophes.

Mr Taylor described two phases of an emergency, the 'operational life saving phase' usually in the control of the police and the 'repair phase' in which normality is restored. It is this latter phase that Mr Taylor's team is concerned with. Their goal is to set up facilities in an emergency that would allow 'business as usual' i.e. the local population would have access to food and shelter.

This requires expert planning and training of local authority officers more used to discussing issues in committee for weeks than preparing for instant action.

In Mr Taylor's control centre deep beneath Middlesbrough Town Hall are detailed maps of each area with schools and other facilities for evacuation marked clearly. These are chosen with care for the facilities they afford for feeding a dislocated and shocked population evacuated from an area. A computerised database contains details of the population of each street by day and by night so the police can be sure that evacuation is complete. These details are checked every six weeks.

In the event of a major emergency the exchange can be instructed to cut off all incoming lines, (which tend to become jammed by calls from distraught relatives and friends) leaving only those designated by the command centre open. These are usually planted deep in the ground to minimise the risk of damage from fire or explosion.

The Emergency Planning Team led by Mr Taylor holds contingency plans for a major rabies outbreak, an oil and marine pollution plan and a Rest Centre and Welfare Plan which are revised constantly in the light of experiences elsewhere. Mr Taylor's team attended 238 liaison meetings last year with interested bodies. Links with other counties are strong and lessons learnt elsewhere are rapidly incorporated in the plans. Mr Taylor is responsible to the elected members of the county but his salary is paid by the Home Office to which he is ultimately responsible for ensuring that the Emergency Plans are compatible with the government's National Response Plan, largely set up to respond to a Chernobyl-like incident.

#### **County care**

All this investment of time and effort is not required by statute but is undertaken under the county's general duty to 'care' for its inhabitants. The Department of the Environment set out guidelines for local councils suggesting that the coastline from the high tide mark to 1 mile offshore was their responsibility and it would follow that the cleanup of marine pollution, as in the recent oil spill incident on the Shetlands, would be down to them. In practice this would require an estimated 500 workers per kilometre of coast and would be unworkable. Langbarugh alone is faced with the £28,000 clean-up cost of oil tanker washings which polluted Coatham sands last summer. In this instance this money is unlikely to be recovered since the polluter remains unidentified.

Without the co-ordinating facilities of the County Emergency Team, the borough councils could not hope to discharge their responsibilities. The team also measures the cost of responding to an incident which could be invaluable when claiming eventual compensation from the 'polluter'.

Mr Taylor's team constantly check their plan with 'drills' and exercises of major incidents. He has never in 17 years had his plan put to the test 'for real' except some minor flooding to the Middlesbrough riverside area, a road tanker that threatened to explode at Cargo Fleet Chemicals works and the recent leakage of petroleum product from an ICI pipeline, all of which required small-scale evacuations. It is frightening to note that when these evacuations were carried out the compliance rate was very poor. Out of 1,100 people in the North Ormesby area advised by the police to evacuate, only 47 turned up at the designated welfare centre, the rest ignored the warning and many went shopping! Hartlepool residents given the same advice were abusive to the officers and complained that their homes would be burgled if they abandoned them!

We in Cleveland are indeed fortunate that we have not experienced a disaster such as the Braer, Exxon Valdez, Lockerbie, Kings Cross, Clapham or Kegworth tragedies. It must be reassuring to all who live, work and shop in this area that Mr Taylor's team is working quietly, unseen and unsung, carefully planning for the unthinkable. Let us hope that all their hard work continues to be in vain!

Dr Glenn Sunman



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



### Keeping pace with the law

The complexity of environmental, health and safety requirements for the storage and distribution of crude oil and petroleum products entails the almost continuous upgrading of technical systems and extensive capital expenditure.

European directives as well as national regulations on health monitoring, vapour emissions and waste control could force huge expenditure at short notice unless companies can get ahead of legislation and plan their expenditure programmes.

According to Roger Hartless, Director of Operations at Simon Storage, while the driving force behind many of the changes is legislation, companies are, all too often, faced with a moving target.

'We have to constantly be involved in the consultation process, both in the United Kingdom and Brussels, to ensure that the regulations that are passed are effective both in terms of their aim and cost. Effective dialogue and consultation is very important as it is too late once the regulations have been rubber stamped.

'Much of the legislation can be either unclear or needs careful consideration before it is implemented.

'Levels of emissions, for example, need to be set sensibly. Perhaps 90 percent control can be achieved effectively. One hundred percent control could lead to a situation where emissions in energy to carry out the process could exceed emissions saved. It is important that legislators realise this.'

Simon Storage is currently implementing its rolling five-year environmental up-grading programme that includes the fitting of high-level alarms, vapour emission controls and enhanced secondary containment. Much of the work is ahead of legislation but the company believes it is 'not clever' to wait until it is forced.

'We have to try to anticipate the legal requirements,' says Mr Hartless, 'but you must not implement changes too early. You want to stay one step ahead of the legislation and competitors – five or six can be counterproductive.'

The company has recently been concentrating its efforts on emissions to water. Improving drainage, collecting a higher percentage of surface water and carrying out extensive analysis and treatment before discharge are all key aspects of meeting tightened environmental standards. 'The key, of course, is not to spill the material in the first place.'

'I have no doubt that discharge levels are going to get tighter with each review. Better operations – requiring training and qualifications tailored to the industry's requirements – and better hardware will be required to meet these standards.

'Totally enclosed systems must be put into place as extensively as possible.'

The management of operations, particularly where different chemicals are being taken into storage or distributed, has been enhanced in recent years by advanced computer control and streamlining operations.

'When handling chemicals in the past,' explains Mr Hartless, 'it was considered essential to clean the pipelines between each change of product. The result was the generation of waste and product loss. Many chemicals are quite compatible and with client liaison it is perfectly acceptable to re-use pipelines between product types without generating waste.

'Once a system is agreed with the client, products are shipped in the right order and pipeline cleaning can be minimised. This can be reflected in the cost of operations.'

The emphasis on training and procedures bear an important role in the safe and efficient operation of any business. Where the business involves the bulk storage of often dangerous products such adherence to procedures is critical.

'We have agreed methods of work through the whole system and these are applied rigorously. It is a disciplinary offence to carry out the work any other way but a regular review is carried out to see if existing methods can be improved.

'The process began when we asked operators how they thought they were required to do their job and how did they do their job. We then physically observed how it was done and tested that against how management thought it should be done. The result was the agreed procedures which mean that there is tighter control over all our operations and a continuity throughout the business.'

Continuity could be just what the industry needs.



Routine testing of firefighting equipment on Butane tanks





### The Environment, Regulation and Profitability

Thursday 29 April 1993 To be held at The Institute of Petroleum

The Keynote Address will be given by Mr. David Pirret, General Manager, Retail, Shell UK Ltd Downstream Oil

Topics to be discussed at this annual IP Conference will include :

- EC initiatives on environmental protection affecting the retail petroleum market
- Enforcement of construction and operation standards
- Regulatory compliance; the cost for the independent dealer
- Vapour recovery at the petrol station
- Developments in underground storage tank systems
- Leakage from underground tanks
- The petrol station market; regulatory change
  and capital values

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



### Improving Oil Industry Cost Competitiveness through the Logistics Chain

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

Papers being presented at this Conference will include:

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

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

### Achieving a low cost culture in the North Sea

#### By Rex Gaisford, Director, Projects, Amerada Hess Ltd

'There is nothing more difficult to take in hand, or uncertain in its success, than to take the lead in the introduction of a new order to things, because the innovator has for enemies all those who have done well under the old conditions and lukewarm defenders in those who may do well under the new.'

So said Machiavelli way back in the 16th century. What was true then is true now — and, especially at this time, true for the future of North Sea operations.

But perhaps Machiavelli is not the best source, because far from being machiavellian – deceitful, perfidious and cunning according to my dictionary – this is a time for straight talking and some honest broking in the industry.

I want to look only briefly at the problem which faces everyone in the industry. These problems have been much debated over the past year in many different fora and the need for a massive change in direction has been convincingly established, no more clearly than in the report of the government's working party on UK Continental Shelf competitive-ness published last month.

These discussions have concentrated on the development and operations sectors of the business. Nevertheless it should be recognised that the efforts to generate real action to achieve a more cost-effective industry must go beyond the operational activities; they must stretch into all areas of supporting services – accounting, human resources, computing and information technology etc.

I want to concentrate my remarks on how the industry might look in a few years down the track. I want to ask three particular questions:-

Where are we going? How do we get there? And how fast? The most important of these is the first. Unless we know where we are going, plotting the course is rather difficult and embarking upon it rather risky.

#### The need for change

The reasons are clear. We are seeing a squeeze between lower prices and revenues on the one hand and a trend of high and rising costs in all phases of our business on the other. A future when field sizes are declining and tax shelters melting away.

The external scenario — the level of prices – is one we must live with and one we cannot influence. But the costs of finding and extracting oil and gas from under the North Sea, and the costs of supporting those activities, can and must be reduced. They must be reduced in a dramatic fashion if we are to make a real difference and get down to the economic levels of production cost typical elsewhere in the world.

The physical and regulatory parameters within which we work mean that we start from a higher cost base than many other oil provinces. However we have also created a phenomenon which has been referred to as 'the North Sea way of doing things'.

Over the last 27 years or more we have built up a culture that has come up with an individual, even a Rolls Royce solution for each and every project.

We have discovered a field, carried out our appraisal and endless studies and then designed (or over-designed) facilities to optimise every detail, to add redundancy to each process or machine, to perfect every system.

Our tendency has been to make it bigger and more complex, and to maximise the offshore facilities to reflect the level of investment that a particular field's economics will stand rather than build a rugged 'nononsense' fit-for-purpose facility and run it in a no nonsense way.

We have added layer upon layer of additional bureaucracy and costs from the drill bit to the board room.

This approach was sustainable in the days of large projects, more favourable oil prices and high marginal tax rates but now the squeeze is really on. The chipping away at the edifice of continuing high and in many cases rising costs is not enough.

What is needed, and now is an established aim, is a a real step change. An order of magnitude. We are at a cross-roads in the history of the North Sea, at the beginning of a new era that requires new vision.

#### A vision of the future

So this brings me to the first of my three questions; where are we going? What is the vision of the industry that we want to see?

We must develop at least an outline of that vision of the industry we want to see if we are ever going to succeed in getting there and it must be one that is capable of sustaining itself well into the next century.

So, as a starting point I will put forward one possible outline of how I see the future. I emphasise this is just one vision of how things will be, it is open to discussion and, indeed, its development must be an iterative process involving the whole industry.

#### The North Sea

I believe the North Sea industry of the future will bear little resemblance to the North Sea industry of the past.

The past was perhaps characterised by massive leaps in technology and size, an era of change and novelty. The future will the era of consolidation, standardisation and costeffective innovation.

In the future we will be dealing with smaller fields developed through simpler and simpler facilities. There will be more shared and mobile installations providing for development costs to be amortised over more than one field.

There will be greater cooperation between the various players in the industry. New relationships between operators, contractors, suppliers and the regulatory authorities will work to produce more standardisation, less bureaucracy, less detailed certification and greater emphasis on goal-setting in regulation and certification.

In all areas there will be a greater concentration on quality and devoting effort to tasks that add real value to our activities.

Contracts and other commercial agreements will be developed through a much clearer, standard approach. The standards, codes etc. that are agreed will be adhered to despite individual desires to modify for particular company or personal reasons. The whole industry will agree to work in this way for the common good and changes will only come about if the party proposing the change can convince the entire North Sea community to change the standard.

#### **Offshore operations**

Operating conditions offshore will be quite different:

- Regional support for offshore operations will be the norm rather than each individual operator running a complete suit of offshore support services;
- Simple maintenance tasks will be shared across the region;
- Specific platform manning will be drastically reduced and many newer facilities will be notnormally-manned;
- Telemetry will be much improved and direct operations from the shore will be the norm.

- Tariffing arrangements will be standardised and formulae for pricing apply.
- Unitisation will be according to standard agreements and redeterminations will be simplified.
- Joint operating agreements will be standard.

As I said this is just one vision of how things will be. It is not complete; it may not be particularly accurate as yet.

But what is clear is that change in this direction is necessary if we are to make real inroads into the high cost base that will, if left untouched stifle and eventually kill UKCS activity. It is a vision of dramatic change for companies and for individuals, for ways of working and for relationships.

#### The response: CRINE

So how will we decide if that 'future' or another 'future' is to be the goal and how will we achieve the fundamental changes that will be necessary to get there?

The industry's response is now taking shape through the vehicle of the Cost Reduction Initiative for the New Era, known as CRINE – an acronym which may not be pretty but at least appears to be memorable!

CRINE was initiated by all the North Sea operators as their response to the challenge. Through a series of seminars and meetings, CRINE has developed to the point where it has a clear and ambitious overall goal – to reduce North Sea costs to a third of their current level.

It is also clear that we must talk about life-time development costs. It is no good pursuing measures which reduce costs in the development stage but raise the costs of on-going operations.

CRINE now has a formal structure, is sponsored and supported by UKOOA, and reports directly to the Executive Officers. Funds have been voted to enable a secretariat to be established to ensure continuity and undertake the considerable amount of leg work that will be required in research and supporting the work of CRINE.

A steering group has been formed which will guide and co-ordinate the work of a number of individual work groups which will concentrate on areas where we believe the most significant inroads can be made.

Initially the work groups will cover:-

- Technical standardisation (off the shelf equipment and designs)
- Commercial standardisation

(off the shelf contracts and purchase orders)

- Specifications and codes (simplification: fit for purpose)
- Regulatory issues (certification; health and safety, etc.)
- Education and cultural change

Although initiated by the operators and sponsored by UKOOA, members are being co-opted from the widest possible industry constituency, taking advantage of their extensive expertise and experience. Each group has drawn up its objectives, a list of priorities, identifying those which will have the most impact, and a schedule to ensure that real progress is made.

Each group will develop a dialogue between the main players, such as the operating oil companies, contractors and suppliers, the engineers, certifying authorities and government for if CRINE is to be a success, the input and co-operation of these parties on an equal basis is essential.

In addition to the work of these individual groups, the steering group will consider the most vexing question of all – how can these changes be brought about?. It is clear that a fundamental cultural shift is required throughout the whole industry. This means not just at the corporate and board level. It requires the attention of managers and specialists in all disciplines and at all levels.

CRINE and its work groups will aim to produce agreements and recommendations and an overall report and implementation plan will be produced in September. But we are very clear – CRINE is not just a talking shop – it is about producing real action and real results.

It is not just a company matter; it is a professional matter and we will be pushing the message through the industry's professional bodies as well through the companies and commercial structures. We also need to spread the word throughout the whole industry, not just the engineers and operations divisions.

For effective change will only be brought about through all our efforts; there is no panacea. It will require a great deal of hard work, heart searching, dialogue and compromise. It is only the people within the industry who can bring about the new way of thinking.

#### The message

Nevertheless even at this stage it is clear that the key to the challenge that lies before us is, in many ways, standardisation. It is about less bureaucracy, less unnecessary paper work, real safety not paper safety, real quality not paper quality. A focus on real value. In accounting terms it is the difference between cost and revenue not just 'cost' nor is it just 'revenue'.

In project terms, what CRINE is working towards is an approach which looks at what is available in the market-place and puts together a package of readily available, precertified facilities, equipment and services which best suit a project, purchased in a clear, simple and costeffective way.

If we do it and mean it, the market will respond with a better and better range of products at more and more realistic prices. The benefits will be substantial. For each development, there will be a reduction in the time and resources devoted to design and engineering, quality assurance, supervision, audit and allocation. A standard chart of accounts across the industry might be a worthwhile aim!

In the formative stages of a project, tendering should be simpler and require fewer resources for both client and potential supplier. Safety and reliability using tried and trusted designs and equipment will be enhanced and ongoing maintenance simplified.

All sectors of the industry will have a greater understanding of operator intentions and requirements, which in turn will lead to more cost-effective manufacturing, fabrication, installation and operation. Most of all it will mean more fields actually being economic and more fields being developed at a much lower individual cost. More oil and gas will be produced with real net income generated.

So how does this translate into practice? I would suggest that there are a number of ways.

These are just a few ideas which might get the debate underway; areas for further examination and discussion which might be worthwhile. I hope others can come up with many, many more!

Our industry involves the transfer of a great deal of financial information between companies – whether it be auditing the activities of a partner, looking at cost allocations, charging and auditing associated with logistics and materials costs.

Many, many manhours are associated with the translation of one company's information into a format that can be understood and used by another.

Applying two of the main themes I have talked about already would make a real difference. Standardisation so that the huge amount of laborious work involved in non-productive dialogue between companies would bring enormous benefits. Coupling this with a common electronic data interchange system to allow fast and reliable transfers of information could produce the kind of step change that is necessary.

A focus on quality to concentrate resources where they make a real difference, particularly in areas such as auditing, could cut bureaucracy at a stroke and result in a process that actually gives direction and help to the audited.

#### Conclusion

It is only if we as an industry all respond together and with a real sense of urgency and commitment that we will secure a successful future for all aspects of the industry and realise the enormous remaining potential of the UKCS.

But we must move forward together. It must be a joint response -

a joint commitment. It is a watershed – one way is WIN WIN; the other way is LOSE LOSE.

Ultimately, like safety and like quality real change will only be brought about by every single individual coming to terms with the reality of the direction in which we are currently heading and committing themselves to change. 'That's the way it's always done' is no longer any argument. CHANGE IS NOT ONLY DESIRABLE, IT IS MANDATORY.

One final thought, taken again from one of the learned gentlemen of history – Francis Bacon, probably known best as ghost writer to William Shakespeare! He wrote, 'He that will not apply new remedies must expect new evils; for time is the great innovator.

This paper was first presented at an IP conference, 'Cost Cutting for North Sea Survival' held in February.





Tel: 071 636 1004; Fax: 071 255 1472.



### Petroleum-Based Land Contamination Conference

Tuesday 25 May 1993 (Please note change of date)

To be held at The Institute of Petroleum

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

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

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

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



### Current Developments in North Sea Drilling Operations

Tuesday 8 June 1993

To be held at The Cavendish Conference Centre London

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

#### Papers being presented will include:

- Well engineering in the 1990s
- Interfacing drilling contractor and operator safety management systems
- Drilling fluids and the environment
- Technological advances for the treatment and disposal of oily cuttings
- Shallow gas hazards the HSE perspective
- The use of active heave compensator systems in subsea well work
- The current focus of drilling and downhole technology R&D in Europe

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

### The environmental classification of complex hydrocarbon mixtures

#### By Dr T H Farmer

The Chemicals (Hazard Information and Packaging) Regulations will require the provision of Safety Data Sheets for the recipients of substances or preparations dangerous for supply. It will be necessary to include information relating to the protection of the environment. The classification of existing substances not shown in the Approved Supply List will have to be undertaken by the supplier employing the available information. No new testing will be needed. Complex mixtures, as exemplified by many hydrocarbon solvents, present a problem because there is little environmental information in the literature and rarely, if ever, have the testing procedures indicated in Directive 84/449/EEC been used.

The International Maritime Organisation (IMO) have published a number of reports (Ref 1) by the IMO/FAO/UNESCO/WMO/WH O/IAEA/UN/UNEP Joint Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP) which relate to individual hydrocarbons. The aspects covered are:

- A. Bioaccumulation and tainting.
- B. Damage to living resources.
- C. Hazard to human health by oral intake.
- **D.** Hazard to human health by skin and eye contact or inhalation.
- E. Reduction of amenities.

It is suggested that this information could be employed in assessing a complex mixture in the preparation of a Safety Data Sheet. The following procedure is proposed:

#### Assumptions

- 1. The individual components in a mixture act in an additive manner and do not exhibit synergism or antagonism.
- 2. The 'Reciprocal Calculation Method' may be used in assessing the overall effects of the individual components in a mixture for each of the above hazard groups (A to E).

i.e. 
$$\frac{1}{X} = \frac{\text{Fraction a}}{Xa} + \frac{\text{Fraction b}}{Xb}$$

- Numerical values may be assigned, on a logarithmic scale, for each of the hazards (see Table I). For 'damage to living resources' and 'hazard to human health by oral intake' these already appear in the criteria.
- 4. When calculating, the worst level in a given range is used. e.g. for

LD50 5 to <50 mg/kg, use 5 in the calculation. This ensures that, when a component(s) in the most hazardous rating is present in a mixture in a concentration of 10 percent or greater, the mixture is at least given that rating.

5. Table II lists the IMO/GESAMP Hazard Profiles for a number of individual hydrocarbon components. Where a product analysis does not differentiate say, between different isomers which are listed separately, the worst classification is employed in the calculation. e.g. when the analysis gives an overall figure for C10 alkyl benzenes for which ratings of 0 and 1 appear in the individual C10 aromatic profiles for 'hazard to human health by oral intake' (C), the range relating to 1 is used in the calculation. When analytical figures are available for each of the C10 aromatic hydrocarbons the respective ratings are used.

Table I – Abbreviated legend to hazard profiles								
IMO/GESAMP Hazard	IMO Rating	Calculation range	Suggested R phrase					
A. Bioaccumulation and tainting	+	0.1 - <1.0	R53					
	Z	1.0 - <10	100					
	Т	10 - <100						
	0	100 - <1,000						
B. Damage to living resources	4	0.1 - <1.0	R50					
	3	1.0 - <10	R51					
	2	10 - <100	R52					
	1	100 - <1,000						
	0	1,000 - <10,000						
C. Hazard to human health by oral intake	4	0.5 - <5.0						
	3	5 - <50						
	2	50 - <500						
	1	500 - <5,000						
and a second	0	5,000 - <50,000						
D. Hazard to human health by skin								
and eye contact or inhalation	Ш	0.1 - <1.0						
	I	1.0 - <10						
	0	10 - <100						
E. Reduction of amenities	XXX	0.1 - <1.0	R58					
	XX	1.0 - <10						
	Х	10 - <100						
	0	100 - <1,000						

#### Table II – Ratings employed in environmental calculations

caroon	Compounds		Comments				
number		A	В	E	Comments		
	Alkanes		and the second	1-1-1-64			A STATE OF THE STATE OF THE STATE
5	normal and iso-pentanes	0	3	0	0	0	
6	normal hexane	0	3	0	II	x	Delayed neurotoxic
6	iso-hexanes	0	3	(0)	0	0	Delayed heurotoxic
7	normal and iso-heptanes	0	3	0	0	0	
8	normal and iso-octanes	0	3	(1)	0	0	
9	normal nonane	0	3	(1)	0	0	
10	normal decane	0	0	(1)	0	0	
11	normal undecane	0	0		0	0	
12	normal dodecane	0	0	(1)	0	0	
13	normal tridecane	0	0	(1)	0	0	
14	normal tetradecane	0	0				
17	normal heptadecane	0	0	(0)	0		
13/14	Isopar M	0	0	(0)	П	x	
	Nanhthenes						
5	cyclo pentane	0	2	(1)			
6	cyclo berane	0	3	(1)	1	X	
7	cyclo hertane	0	3	1	II	X	
7	mathyl gyala havana	0	3	(1)	Ш	Х	
0	athul angle have a	0	3				
0	ethyl cyclo nexane	0	3	1	0	0	
10	Isopropyi cycle nexane	0	(3)	0	0	0	
10	decaim	0	(1)	1	0	X	
	Aromatics						
6	benzene	0	2	1	II	XXX	Human carcinogen
7	toluene	0	2	1	П	XXX	Neurotoxic
8	ethyl benzene	0	3	1	I	XX	Lachrymator
8	mixed xylenes	0	3	1	II	XX	Tested/tainting
9	trimethyl benzenes	Т	3	0	I	х	
9	1,4-methyl ethyl benzene	Т	3	0	0	0	
9	1,2-methyl ethyl benzene	Т	3	0		-	A PARTICIPATION AND A PART
9	cumene	Т	3	1	I	x	Tested/tainting
9	normal propyl benzene	(T)	3	0	Ī	x	a concur tunning
10	tetra methyl benzenes:						
	1,2,3,4-	Т	3	0	0	0	
	1,2,3,5-	Т	3				and the second second second
	1,2,4,5-	Т	3			- FO . C. M.	and the second second second
10	butyl benzenes	Т	3	1	I	x	
10	diethyl benzene	Т	3	1	Î	x	
11	tertiary butyl toluene	Т	3	î	Î	Y	
11	normal amyl benzene	T	4			A	
12	normal hexyl benzene	Ť	4				
12	diisopropyl benzene	Ť	4	0	0	0	is hard a state of the
13	normal heptyl benzene	Ô	4	0	0	0	
14	normal octyl benzene	0	0	in the second		And States	- I A A A A A A A A A A A A A A A A A A
15	normal nonyl benzene	0	0				
	Nanhthalenes		12.9	-		810 100	The second second
10	naphthalene	Т	3	2	1	x	Tested /tainting
11	1-methyl naphthalene	Ť	3	1	Ô	Y	Tested/tainting
16	diisopropyl naphthalene	+	3	1	0	0	Tested/tainting
and the second	r-r, minute	al and a second second	-		0	0	resteu/tainting

Table III	Aliphatics (%)	Naphthenes (%)	Aromatics (%)
Standard white spirit	-		-
C8		-	1
C9	14	5	8
C10	28	8	9
C11	17	5	1
C12	2	2	
Dearomatised white spirit			
C8	-	1	-
C9	14	13	
C10	28	17	-
C11	17	6	
C12	2	2	-

In order to assess the previous approach, calculations were undertaken for a 'standard grade white spirit' and the corresponding dearomatised product obtained by hydrogenation. The results were compared with the IMO/GESAMP entries for similar products (**Table IV**). **Table III** (above) gives the analyses employed.

#### Discussion

The calculated ratings for 'standard white spirit' differ from the IMO/GESAMP classifications for 'bioaccumulation and tainting' (A) and 'hazard to human health by skin and eye contact or inhalation' (D). For both hazards the IMO levels are more rigorous than the calculated levels which is difficult to understand as, apart from the C8 aromatics (1%), all components have ratings 'less' than those assigned to white spirit for 'A' and 'D'. Admittedly, in the calculation, the classifications for the normal paraffins have been used for the corresponding C number iso-paraffins and the classification of decalin for the C10, C11 and C12 naphthenes. However, this would appear acceptable from the general knowledge of these 'isomers'.

In comparing the calculated and IMO ratings for the dearomatised white spirit, differences appear for 'damage to living resources' (B) and again for 'hazard to human health by skin and eye contact or inhalation' (D). The former is particularly difficult to understand as 28% of the components have been given a rating of '3' by IMO/GESAMP. Similarly for Hazard 'D', a calculated classification of '0' would seem reasonable unless it were considered that isoparaffins or the higher naphthenes are particularly irritant.

#### Conclusions

1. In the absence of reliable environmental data for complex hydrocarbon mixtures, the reciprocal calculation procedure is a useful method for initial classification. This approach is simple and would enable industry to harmonise the classifications of a large number of chemically complex products. The flexibility of the method is an additional advantage.

The differences between the calculated and IMO/GESAMP ratings for two grades of white spirit require some thought. It would be helpful if there were entries in the IMO Reports for the higher C number iso-paraffins and naphthenes.

- **Ref 1.** The Evaluation of the Hazards of Harmful Substances Carried by Ships:
  - Revision of GEASAMP Reports and Studies No.17 (IMO 1989).

Working Group on the Evaluation of the Hazards of Harmful Substances Carried by Ships:

Report of the Twenty-fourth Session (IMO 1989).

Report of the Twenty-fifth Session (IMO 1990).

Report of the Twenty-sixth Session (IMO 1991). Report of the Twenty-seventh

Session (IMO 1992).

Hazard	A	В	С	D	E
Standard white spirit					
Calculated rating	Т	3	1	I	X
IMO classification	Z	3	1	11	X
Dearomatised white spirit					
Calculated rating	0	3	1	0	X
IMO classification	0	0	1	п	X

An example of the calculation for 'bioaccumulation and tainting' (A) for 'standard white spirit' is given below:

1 =	= 0.01	+	0.14	+	0.28	+	0.17	+	0.02	+	0.05	+	0.08	+	0.05	+	0.02	+	0.08	+	0.09	+	0.01	=	0.0262
A	100		100		100		100		100		100		10		100		100		100		10		10		
-											1 (7 1		T												

Therefore A = 38 which is within the 'T' band (Table I).

### **IP Information Service News**

#### **IP** Information Service News

#### **Times of Service**

Visitors welcome: 9.30 a.m. to 5 p.m. Telephone queries: 10.00 a.m. to 5 p.m. Monday to Friday (except Bank Holidays).

#### The Library of the Institute of Petroleum

The IP Library holds much material dating back to the turn of the century, as well as items just published. The collection is probably the most comprehensive on the subject of petroleum and is used extensively by researchers, business people and students alike.

Visitors to the Library can make use of this wealth of material for themselves, including:

- Oil industry directories
- Periodicals
- Conference proceedings
- Technical papers
- Books
- Statistical publications

Many items are available for loan to IP members.

IP Members use the Library free of charge; non-members are welcome but pay £10 entrance fee for half a day or £15 for a full day; and students are charged £1.

If you have not used the library before and/or would like guidance on the materials available, please contact **Catherine Cosgrove**, or any other member of Library Staff, on 071 636 1004.



#### News

Membership of the Information For Energy Group is open to anyone interested in any aspect of energy and information about energy. The present membership includes librarians and information officers in all energy sectors, not just oil or gas; energy and information consultants; researchers; and directors and other managers of companies concerned with energy. You do not have to be a member of the IP to join.

The group organises evening meetings, visits and conferences, and publishes a membership directory (available only to members) once a year.

If you are interested in joining, for £10 for 1993, please contact Catherine Cosgrove on 071-636 1004 or write to her at the Institute of Petroleum, 61 New Cavendish Street, London, W1M 8AR.

#### Selected additions to Library Stock

#### **Directories and Bibliographies**

Forecourt news directory 1993. London, Blenheim Group, 1993. Guide to petroleum statistical information. AMERICAN PETROLEUM INSTITUTE. New York, 1991.

The HCB tank guide: The international handbook for the road tanker and tank container industries: Directory of the tank container and road tanker industries worldwide. 3rd ed. London, Intrapress Publishing, 1993. Offshore engineer yearbook 1993. 1st ed. London, Thomas Telford, 1992.

Petroleum and marine technology information guide: A bibliographic sourcebook and directory of services. Edited by: Myers A. et al. 4th ed. London, E & F N Spon, 1993.

#### Upstream Oil Industry

Fourth North Sea safety conference: A united commitment; Thursday 29th October 1992. TECHNOLOGY FORUM, HEALTH AND SAFETY EXECUTIVE. London, Technology Forum, 1992.

Guidance notes for submarine pipeline applications: Under the Petroleum and Submarine Pipe-lines Act 1975. DEPARTMENT OF TRADE AND INDUSTRY. London, HMSO, 1992.

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United Kingdom offshore regional report: The geology of the southern North Sea. BRITISH GEOLOGICAL SURVEY. By: Cameron, T D J et al. London, HMSO, 1992.

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#### Forecasts

Process industries investment forecasts 1992 – 1996 Volume 27. 27th ed. Chelsworth, Construction Forecasting & Research, 1992.

Prospects for field development, expenditure and production from the UK Continental shelf 1992 – 2010: A financial simulation. ABERDEEN UNIVERSITY PETROLEUM AND ECONOMIC CONSULTANTS. 1992.

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Motor vehicle emission regulations and fuel specifications - 1992 update. Concawe 2/92. Brussels, Concawe, 1992.

Performance of oil industry cross-country pipelines in Western Europe Statistical summary of reported spillages – 1991. Concawe 4/92. Brussels, Concawe, 1992.

A study on the present and future service station equipment market in Denmark, Norway, Sweden and Finland. By: Madge A. London, International Business Services, 1992.

#### World Oil

Former Soviet Union – Oil and gas industry: Speakers papers Cafe Royal, 5 March 1992. London, Ernst & Young, 1992. Former Soviet Union – oil and gas industry. London, Ernst & Young, 1992. The future role of OPEC. By: Dr Subroto. The Hague, Opec, 1992.

### ... technology news

### European standard forecourt interceptor

Over the last 18 months, mounting environmental pressures have led to more stringent legislation and a radical re-thinking on the performance requirements of the traditional filling station interceptor.

Alan Green, the director responsible for Conder's Forecourt Products division, explains that with the exacting standards imposed, Conder was not prepared to risk its reputation by rushing into the production of new models, using unproven technology. Instead, the company has embarked on a carefully planned development programme involving exhaustive testing on what is calimed to be the only test rig in the United Kingdom that meets the European CEN requirements. So far, Conder has invested in excess of £100,000 on this project, but in launching the new ANO 127 model the company believes it is another step closer to providing a range of forecourt interceptors that will fully comply with the new standard (PREN 858-1) - the next model is already under test.

This latest generation interceptor features an automatic closure device which prevents discharge of accumulated light liquid into the drainage system and also incorporates a secondary chamber with coalescing filter to improve the quality of the outflow. As an optional extra, a visual and audible alarm can be incorporated.

Like all Conder interceptors, the new model is manufactured in GRP and is designed for simple, rapid installation.

The closure device, which is activated by the accumulated light liquid, features a gimbled float connection to ensure effective operation and is engineered in stainless steel with a neoprene rubber seal. It is located in the unit's primary chamber which also features directional a submerged inlet to maximise separation. From there, the water is displaced via a duct system into a secondary chamber, where it passes through the coalescing filter for final separation prior to discharge to the surface water drainage system.

Conder will supply the coalescing filter as a selfcontained module for upgrading existing interceptor installations.



The Phoenix Survival Craft was developed as a totally enclosed lifeboat for use offshore on rigs and diving vessels. One version incorporates a hyperbaric chamber so that divers undergoing decompression can be evacuated. A more recent twin engine craft provides more power and manoeuvrability.

Fibre Reinforced Products Limited of Peterlee has acquired the plans and moulds for the Phoenix Survival.

#### Foam fire fighting system

Floatafoam System is the latest fire protection equipment product from Angus Fire. It is designed to protect hydro-carbon fuels stored in floating roof bulk storage tanks

The system was developed to replace environmentally unacceptable halon systems which are now being phased out. It is a fully integrated detection and automatic foam extinguishing system for fires that occur in the high risk rimseal area of the tank.

If fire breaks out, a heatsensitive pneumatic line detector in the seal area instantly activates the system especially developed aspirating nozzles, located at intervals around the circumference of the tank, deliver high quality aspirated Petroseal FFFP foam directly onto the fire. In addition to providing rapid knockdown, the slow draining fluoroprotein-based foam blanket also provides outstanding security against re-ignition and cools the seal material – a major advantage over halon and other gaseous systems.

The foam is supplied from premix storage vessels mounted on top of the floating roof. Since each system protects 40 metres of tank circumference, only the foam storage vessel in the affected area is discharged. The system incorporates an automatic alarm to alert staff to the fire.

#### Sulphur dioxide analyser

New portable and fixed sulphur dioxide (SO<sub>2</sub> analysers have been developed by Analytical Development Co. Ltd for monitoring emissions and combustion processes.

Sulphur dioxide, produced from burning all types of fossil fuels, is a major contributor to acid rain. Increased concerns about the acidification of lakes and damage to forests in Northern Europe have led to the tightening of SO<sub>2</sub> discharge consents. The European Commission directive 704 and the subsequent UK Environmental Protection Act (1990) specify reductions in SO<sub>2</sub> emissions from boiler plant operation, waste incineration and a variety of other processes. Hefty fines are imposed on companies failing to keep emissions within legal limits.

Based on the principle of infrared gas analysis, the analysers provide precise, reliable readings within a minimum range of 0-200ppm up to a maximum of 0-100 percent. Ensuring combustion processes are kept within statutory SO<sub>2</sub> limits, the analysers provide readings that are unaffected by the presence of other gases and vibration, and are accurate for temperatures in the range 0° to 40°C.

The fixed ADC7000 analyser is microprocessor controlled, and a simple keyboard, menu-driven control and large graphics display make operation easy. Options include multi ranges, automatic calibration, correction for ambient temperature and pressure variation and alarm facilities. The analyser is equipped with a range of outputs for interfacing with external equipment and provides readings in a variety of measurement units.

The portable RF version allows the user to make spot-check measurements at particular sites. SO<sub>2</sub> emissions from several locations can be measured in a single trip where a fixed sampling probe is fitted to each stack. The analyser requires either 240V mains power or an optional rechargeable battery, and is supplied in a robust aluminium case.

### ... technology news

#### Emissions monitoring

A new FCI Thermal Mass Flow Transmitter, specifically designed for large ducts and stacks, is now available from Allison Engineering Ltd.

Future legislative requirements of HMIP, will involve not only the regular/ continuous monitoring of contaminants, but also the continuous monitoring of mass flow in order for quantitative emission assessments to be made. Certified by the T.U.V. in Germany and the E.P.A. in the U.S.A., the model MT91 is already in use. Its unique features have been designed to meet and exceed the latest E.P.A. requirements (CFR40, Parts 52, 60 and 75) for continuous emissions monitoring.

The new model MT91, utilises the well-proven techniques of other models, but combined within a multipoint probe assembly, which when specifically designed for particular stack diameters, is able to provide a mass flow reading directly, without the need for utilising 'D.P.' device, measuring velocity only, that tend to get pluggedup with dirt.

The FCI Thermal Mass Flow Transmitter utilises specially matched platinum R.T.D's, one of which is preferentially heated to establish a differential temperature, which when electronically processed, generates a 4-20mA analogue output, directly proportional to mass flow.

Using multi-point sensors, the instrument is ideally suited for inadequately developed flow profiles and the unit may be supplied with a mass flow indicator and/or a cumulative totalizer.

Allison Engineering Ltd., utilise a computer programme in order to generate sufficient information to assess customers' requirements and to provide detailed proposals.



A new passive fire protection system from A.I C, designed specifically for use by the oil and petrochemical industries, has passed a hydrocarbon jet fire test at the British Gas test facility at Spadeadam, Cumbria.

The A.I.C. PFP Jacket System now carries jet fire ratings of J45 (actuator) and J60 (valve) The test was independently assessed and witnessed by Lloyds Register.

The system consists of flexible high temperature insulating covers made from a unique and revolutionary material, says the company, with the entire system designed for easy and rapid installation and removal.

Sales director at A.I.C. Mr Chris Foster explained: 'In the event of a severe hydrocarbon fire in a critical offshore area it is imperative that any inventory flows are shut down quickly, effectively and for as long as possible.

'Generally an emergency shut down valve will function if the temperature of the actuator is kept below 1000C and the valve below 2000C. During the full scale simulation carried out at Spadeadam our system ably demonstrated its capability to do this with the actuator temperature reaching only 50C after 15 minutes at 1,1000C and 1000C after 46 minutes.'

The system itself has been developed following close liaison with the petroleum industry. It consists of a new material which in its 'raw' state is pliable and easy to manoeuvre but when exposed to fire changes its molecular structure.

As the structure changes the material hardens and forms a barrier between the insulating 'duvet' underneath and the actuator or other equipment it is protecting.

#### Personal toxic gas monitoring

MSA announce the launch of the new pocket, single gas toxic monitor MicroMAC, available in two models:

 An alarm version offering Real Time, Short and Long Term exposure values;

2) a dosimeter version offering additional datalogging with download facility.

The two versions allow the safety professional the means to assess the degree of hazard and then the option of providing toxic gas monitoring based on the outcome of this initial assessment in accordance with COSHH.

Both units offer the benefits of user-friendly operation in an instrument that is the lightest in its class. Logical prioritised and latching gas alarms alert the wearer to increases in exposure over predetermined levels, set either at recognised occupational exposure standards or those required by the company. Current gas concentrations and time weighted values are always accessible.

#### Sulphur in oil

Yokogawa has combined developments in the fields of electronics, radioisotopes and mechanics to produce the model PS6 Sulphur-in-Oil analyser, which continuously measures the concentration of sulphur (in wt%) present in petroleum products.

High resolution (0.5 wt% S full scale) and repeatability of 0.005 wt% S is achieved by using a combination of advanced technologies.

X-rays pass through a liquid cell filled with the oil to be measured and are attenuated by the liquid. The sulphur concentration is determined by the degree of attenuation, indicated by detection of the X-rays after passing through the liquid cell.

Americium-241, with a half life of 458 years, was chosen as the X-ray source for model PS6. An X-ray energy level at which absorption is not influenced by the oil's carbon-to-hydrogen ratio has been attained by developing a sophisticated metallic target plate which is bombarded with X-rays to produce a secondary radiation characteristic of the required level.

An ionization chamber is used for the X-ray detection needed to calculate sulphurin-oil content. They do, however, require ultra-low current amplifying techniques for accurate and stable measurements with ionization currents in the 10-12 to 10-11 ampere range. Yokogawa has solved this problem by developing an advanced electrometer amplifier.

The PS6 virtually eliminates errors caused by viscosity, pressure and flow rate changes. A sampling device extracts suitable samples from the process stream, providing immediate quantitative and qualitative information about the actual flow.

In petroleum refineries its data is outputed directly to computer controlled in-line blender systems and monitors desulphurisation plants for maximum efficiency.

### ... technology news

#### New in-line fuel sampler

A fuel sampling device has been jointly developed between Jiskoot and Oil Bulk & Quality Services Ltd (UK). The sampler will be marketed on a lease and maintenance agreement through Transpec Services Ltd.

The sampler is fully portable, weighing only 70 kgs and derives its operating power from the flow of oil through the line. The sampler requires no external electrical or hydraulic power source and is constructed as a 'T' shaped spoolpiece to be fitted in-line or at a vessel's manifold connection with eight, ten or twelve inch Class 150 P.S.I.flanges.

The sampler can be used unattended once set up for batch transfer and will deliver three flow proportional samples to meet ISO 3171 standard. The device is powered by an impeller driven mechanism, and by using in-line technics is able to overcome the flow characteristics of High Viscosity/Low Pour Point fuels to deliver 0.47cm3 of sample to each of the three with containers each revolution of a camshaft utilising a simple self powered mechanical process.

The major problem for both ship owners and suppliers has been the lack of a reliable method of obtaining a truly representative sample of heavy fuel oil bunkers at the custody transfer point and consequently little valuable information of the actual quality and hence inadequate arguable evidence when loadings resulted in claim procedures and ultimately in failure to salvage the losses incurred.

The definite progression within the oil industry to increase the output of thermal and catalytic 'cracked' products means that the resultant residues which are used to blend heavy marine fuel oils will contain greater percentages of carbon, asphaltenes, and metallic components such as aluminium and silicon, which when burnt in the cylinders of diesel engines can form ash compounds of greatly differing characteristics. This in turn makes assessment of compatibility/ stability qualities difficult when fuel oils of differing grades are to be co-mingled in engine room storage tanks.

The only sure way of avoiding costly losses due to being supplied with poor quality bunkers is to have a means of obtaining a truly accurate sample which is fully representative of the total quantity of the fuel oil supplied, which on results of the analysis would determine the most efficient and cost effective use of additives.

Contact list	
Cranfield Institute of Technology	0908 694134
FRP Limited	0902 805577
Tonap Analytical Development Company	0243 861131 0992 469 638
MSA Britain	0236 424966
Allison Engineering Ltd A.I.C. Fire Protection	0268 526161
Angus Fire Vokogawa LIK I td	0844 214545
Transpec Services Ltd	0642 817181

#### **Biosensor monitoring**

Researchers into biosensors at Cranfield Institute of Technology have invented the first biosensor able to monitor gases reliably.

The breakthrough means sensor can be used in health and safety and environmental monitoring for hazardous organic vapours and gases and also enables catalytic conversion in gases to remove toxic material from factory exhausts. It is particularly suitable for the automotive, manufacturing and petrochemical industries.

Professor Tony Turner, Head of Cranfield Biotechnology Centre, says 'Many organic vapours and gases are commonly found in the workplace but there are currently no costeffective methods of monitoring them accurately. Expensive equipment such as mass spectrometres can do the job but we have invented a low-cost technology which we want to develop commercially.'

The Centre has just won a £300,000 contract under the EC's environment programme to develop its sensor for three hazardous and toxic gases: phenol vapours (found in the furniture industry for example); methane; and a gas from the sulphur/nitrogen oxides group, major atmospheric pollutants. Cranfield Biotechnology Centre's partners in this project are the University of Ioannina in Greece and City Technology, a major UK gas sensor company.

#### Airline breathing apparatus

Tonap has introduced a new airline breathing apparatus which has been specifically designed to fulfil the mandatory requirements of COSHH and Boeing for workers inside aircraft fuel tanks.

Developed in collaboration with British Airways, the trolley mounted Tonap T 102 allows for a two-man work team with an external supervisor or sentry. A major advantage of the system is that it features two hose reels so that workers can operate independently in different parts of the aircraft.

Designed for operation from a permanent air source the T 102 incorporates full filtration to provide breathing quality air for an unlimited working duration.

In this potentially hazardous application, worker safety is paramount and the T 102 has a number of features. It is claimed to be the only breathing apparatus of it type with intrinsically safe voice activated conference style communication and remote gas monitoring facilities.

The external sentry is thus kept fully informed on conditions and work rate inside the fuel tank. As workers can also communicate directly with one another, efficiency is also improved as well as increasing the speed and effectiveness of a rescue team in the event of an emergency.

Other safety features include emergency compressed air cylinders plus audible and visual alarms. Air is supplied via special anti-static kink-resistant hose. This airline breathing apparatus has been designed for maximum worker safety and comfort.

The new T 102 has been adopted by British Airways and builds on the previous success and expertise of Tonap in the area of specialist breathing systems.

### ... people



Mr Allan Whittaker, above, has been appointed Managing Director of Hydra-Tight Ltd., the UK based world leader in the design and maufacture of specialist hydraulic bolt tightening systems and providers of on-site services.

Esso UK plc has appointed Mr P J (Phil) Dingle as Managing Director of its subsidiary company, Esso Exploration and Production UK Limited. Mr Dingle joins Esso Exploration and Production UK Limited from Canada and succeeds Mr K H Taylor recently appointed Chairman and Chief Executive, Esso UK plc.

Mr Graham L Footitt, formerly Vice-President Finance for Shell Brasil S.A., has joined the Board of Shell U.K. Limited as Finance Director and succeeds Mr Malcolm Raiser who retired at the end of February, after 36 years with Shell.



Stratamodel Inc. has announced the appointment of **Mr George C Steinke**, above, as President. Mr Steinke will work from the corporate headquarters in Houston and direct all company operations. Dr De Pauw has been appointed General Manager Fuels, Texaco Services (Europe) Ltd. Dr De Pauw will remain based in Belgium and be responsible for the day-to-day administration of the new European fuels advisory committee. The EFAC has been created to co-ordinate fuels marketing, research and development activities within Texaco Europe.

Mr Stewart Cusden has been appointed General Manager, Lubricants, Texaco Services (Europe) Ltd. He will be responsible for the co-ordination of all aspects of lubricant supply, manufacturing and marketing in Europe. Mr Cusden will also become chairman of the Europeans lubricants steering committee (ELSC).



Mr Ken Donlan, above, has been appointed Managing Director of Ethyl Petroleum Additives, the European sales and marketing arm of the US Fortune 200 Ethyl Corporation.

Mr Lieven Blom, formerly Secretary General of Cometec-Gaz, of Marcogaz, and of A.R.G.B., has now retired. The association Cometec-Gaz has been replaced by EUROGAS, European Union of the Natural Gas Industry and Mr Peter G Claus has been appointed Secretary General of Eurogas and Marcogaz. The successor of Mr Blom for the A.R.G.B., is Mr M Hellebaut.

Weatherford International (Houston, Texas) has appointed **Mr E 'Bo' Eagles** as President and General Manager of Weatherford's Fishing and Rental Tool division. He will also serve as Executive Vice President of the parent company. Stone & Webster Engineering Limited has formed a Refinery Projects Group at its Milton Keynes headquarters and **Mr Pierre Hibble** has been appointed Manager with **Mr George Stergios**, who re-joins the company, as Business Development Manager.



Western Geophysical has appointed **Dr Scott MacKay**, above, Manager of its newly formed Geophysical Research and Development group in Denver, Colorado.

Mr Gerald Wingrove has been appointed Finance Director at Enron Europe and will be responsible for all the company's financial matters.

Mr Allen J Krowe, Senior Vice President of Chief Financial Officer of Texaco, has been elected Vice Chairman of Texaco Inc. and elected to the company's Board of Directors.



Mr Ian Brown, above, has joined Rotork Actuation in Bath to take up the newly created position of European/Middle East Sales Manager – Fluid Power products. Ian will provide product support and project co-ordination to Rotork's distributors of its SP, P and H range of fluid power actuators including Exeeco, distributor of Rotork pneumatic and hydraulic actuators in the UK.

**Dr Larry Sweet**, senior vice president of R & D for ABB's Worldwide Industry Segment has been named to the Board of Directors for the InterOperable<sup>TM</sup> Systems Foundation.

Jordan Kent Metering Systems Ltd., has appointed **Mr Ralph Whelan** as Export Sales Manager to boost the company's sales overseas.

Mr Jon Nicholson has joined Weatherford International (Houston, Texas) as Corporate Director of Human Resources. His responsibilities will include human resources and employee benefits on a worldwide basis.



Mr Boyd Kolozs, above, formerly General Manager of Western Geophysical's Far East and Australia division, has been appointed Vice President of operations in the Far East and Australia and will be based in Perth, Western Australia.

Mr Cliff Roberts has been appointed Production Director at Smith Flow Control Ltd after five years as the company's Production Manager.

Mr Charles Macpherson has joined John Brown Engineers & Constructors Limited and will take overall responsibility for all offshore pipeline projects undertaken by John Brown's London office.

Petroleum Review April 1993

### Institute News

#### **Benevolent Fund**

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

#### Around the Branches

#### Aberdeen

13th April: 'The Scott Field Development', Keith Hart, Amerada Hess 11th May: 'Oil Prospects in the Commonwealth of Independent States', Steve Remp, Ramco

8th June: Visit to Peterhead Power Station

#### Yorkshire

16th June: Golf Tournament - Otley Golf Club

#### Southern

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

#### Northern

12th April: Hot Pot Supper

#### Midlands

21st April: 'Electricity at Work Act – Sparks Us Into Action', Speaker from C A Sothers Limited, Electrical Contractors 13th May: 'Fire Prevention', Presentation and Tour by the Fire Department, Birmingham

#### South Wales

22nd April: 'Real Time Route Planning', Mr J Abbott, General Logistics plc

#### North East

23rd April: Annual Dinner Dance 11th May: Visit to Hartlepool Nuclear Power Station

#### Humber

12th May: 'Blast and Fire Research for Offshore Structures', Dr M Mihsien and Dr Vasey, Engineering Research Station, British Gas plc, Newcastle

#### London

27th April: 'Current Tax Issues – The UK North Sea', P M Naylor, Arthur Andersen & Company

18th May: 'The Application of Horizontal Wells in Oil & Gas Development', Professor J M Peden, Heriot-Watt University

#### Deaths

We have been notified of the following deaths:

	Elected
H A Bertram, Chatham, Kent	1954
K S Collinson, Dyce, Aberdeen	1965
P G Davy, Charmouth, Dorset	1954
E Etherington, Bognor Regis, W Sussex	1972
G S Everett, Houston, Texas	1973
R N Jackson, Winthrop, Western Australia	1957
R McEwan, Lightwater, Surrey	1976
T K Pilcher, Chatham, Kent	1972
V C Prazak, Battersea, London	1989
P N G Price, Sutton, Surrey	1978
D G Turpin, Sevenoaks, Kent	1960
T D E Williams, Croydon, Surrey	1980
L H Young, Canterbury, Kent	1953



London Branch and Exploration & Production Group

#### 'Current Tax Issues - The UK North Sea'

#### at the Institute of Petroleum 6.00 pm Tuesday 17 April 1993

by Mr P M Naylor, Arthur Andersen & Co SC,

Malcolm Naylor's presentation will cover the tax treatment of foreign currency movement, enhanced tax depreciation, the 'Pay & File' regime, plus a variety of other upstream tax issues which affect companies operating in the North Sea. The opportunity will also be taken to consider the changes proposed in the Chancellor's Budget speech.

The meeting is preceded by the AGM of the London Branch at 17.30 hours. Nominations for Committee membership should be sent to the Secretary by 25 April. Tea and biscuits will be served at 17.15 hours and the meeting is followed by light refreshments, kindly sponsored by Esso Petroleum Ltd.

> Enquiries: Mrs E Walker, Hon Secretary, London Branch. Tel: (0926) 404257

UK Deliveries into Consumption (tonnes)					
Products	†Feb 1992	*Feb 1993	†Jan-Feb 1992	*Jan-Feb 1993	% change
Naphtha/LDF	281,555.0	220,518.0	575,715.0	554,123.0-4	
ATF - Kerosene	457.016.0	460,452.0	927,660.0	941,988.0	2
Motor Spirit	1.842.828.0	1,787,818.0	3,740,809.0	3,536,195.0	-5
of which unleaded	817,704.0	904,142.0	1,649,844.0	1,776,860.0	8
of which Super unleaded	100.726.0	109,502.0	201,484.0	216,240.0	7
Premium unleaded	716.978.0	794,640.0	1,448,360.0	1,560,620.0	8
Burning Oil	252.871.0	251,413.0	550,716.0	540,159.0	-2
Dery Fuel	852.917.0	905.681.0	1,728,220.0	1,774,394.0	3
Gas/Diesel Oil	702,546.0	692,110.0	1,506,802.0	1,411,496.0	-6
Fuel Oil	982,929.0	984,649.0	2,134,932.0	1,914,742.0	-10
Lubricating Oil	63.028.0	60,904.0	130,049.0	122,368.0	-6
Other Products	551,622.0	596,268.0	1,132,808.0	1,186,236.0	5
Total above	5.987.312.0	5.959.813.0	12,427,711.0	11,981,701.0	-4
Refinery Consumption	480.936.0	488,945.0	980,527.0	1,038,210.0	6
Total all products	6,468,248.0	6,448,758.0	13,408,238.0	13,019,911.0	-3
†Revised with adjustments *Prelimin	nary n/a Not Available				

### Institute News

#### **New Members**

- Dr F I Amakiri, PO Box 1042, Port Harcourt, Nigeria
- Mr S K O Ampofo, Market Research Dept, Ghana National Petroleum Corpn, PMB 599, Tema, West Africa Ghana
- Mr W O Anderson, Andersen Consulting, 2 Arundel Street, London, WC2R 3LT
- Mr M T Aung, 10 Preswylfa Street, Canton, Cardiff, CF5 1FS
- Dr E Barrett, Brigantian Exploration Ltd., Thatched Cottage, The Green, S Collingham, Newark, Notts, NG23 7LE
- Mr J M Botly, Mobil Oil Co Ltd. Coryton Refinery, Standord-le-Hope, Essex, SS17 9LL
- Mr G Bruce, 5 Millfield Avenue, Inverurie, Aberdeenshire, AB51 9UF
- Mr D L Burley, 70 Sevenacres, Thame, Oxon, OX9 3JQ
- Mr I Clifton, ISL Instrumentation Ltd., 8 Claire Court, Rawmarsh Road, Rotherham, S Yorks, S60 1RU
- Mr J L Colnaghi, Hydrocarbon Resources Ltd., Av.Rio Branco, 181/ GR.3504, Rio de Janeiro, 20040-007 Brazil
- Mr J F Crossland, GEC Marconi Aerospace, Abby Works, Titchfield, Fareham, Hants, PO14 4QA
- Dr R Decker, Ultrakust Electronic GMBH, Schulstr.30, D-8375 Gotteszell, Germany
- Mr J Den Ouden, Mercon Groep BV, Krinkelwinker 6 8, PO Box 254, 4200 AG Gorinchem, Netherlands
- Mr E D Difini, Instituto Brasileiro de Petroleo, Av Rio Branco 156, Rio de Janeiro, Brazil
- Mr A J Dillon, Stevens Cottage, Scatterdells Lane, Chipperfield, Kings Langley, Herts, WD4 9EX
- Mr R G Doel, Oakworth, The Hurst, Winchfield, Basingstoke, Hants, RG27 8DE
- Dr I G Doolittle, Ashurst Morris Crisp, Broadwalk House, 5 Appold St, London, EC2A 2HA
- Mr P Fairclough, Guernsey Gas Group, PO Box 310, St Peter Port, Guernsey, Channel Islands
- Mr E Forson, 11 Grange Road, Elstree, Borehamwood, Herts, WD6 3LY
- Miss L T Gordon, 187 Headland Court, South Anderson Drive, Aberdeen, AB1 7HZ
- Mr C J Griffin, 17 The Park, Ealing, London, W5 5ML
- Mr S E Hammond, Hammond Lubricants & Chemicals, 253, Golden Hillock Road, Sparkbrook, Birmingham, B11 2PJ
- Mr F Hitchins, Garden Flat, 141B Lee Park, Blackheath, London, SE3 9HE
- Mr A P Horton, 9 Maritime Close, Greenhithe Quay, Greenhithe, Kent, DA9 9QW
- Mr N M Hugh, GEC Marconi Aerospace, Avery Hardoll Fluid Mngmt Products, Abbey Wks, Titchfield, Fareham, Hants, PO14 4QA
- Mr N H Jones, Texaco, 1 Westferry Circus, Canary Wharf, London, E14 4HA
- Mr J L Kennedy, Oil & Gas Journal, 3050 Post Oak Blvd., Suite 200, Houston, Texas, 77056 USA
- Mr T J Kerklaan, Tuinkruid 10, 4907 HN Oosterhout, Netherlands
- Mr H M Kim, Yukong Ltd., 3rd Floor, 28 Margaret Street, London, W1N 7LB
- Mr O Kolawole, Nigerian National Petroleum Corpn, Carrier House, 1-9 Warwick Row, London, SW1E 5ER
- Mr Wai-Hung S Luk, 9 Forfar Close, Darlington, Co. Durham, DL1 3PR Mr B A Madani, Sharjah National Lube Oil Co Ltd., PO Box 1575,
- Sharjah UAE
- Mr N Mahmood, 61 Pembury Close, Hackney, London, E5 8JP
- Miss A M Mattock, 6 Falcon Court, Gilbert White Way, Alton, Hampshire, GU34 2LP
- Mr R Morrow, 63 Charlton Gardens, Westbury-on-Trym, Bristol, BS10 6LU
- Mr K Murray, 52 Woodford Brewery Road, Stillorgan, Blackrock, Co Dublin, Ireland
- Mr K H M Ng, Nomura Bank International plc, Nomura House, 1 St Martin's-le-Grand, London, EC1A 4NP
- Mr J I Odogwu, International Centre for Public Enterprises, Dunajska 104, SLO 61109, Ljubljana, Slovenia
- Mr P G O'Neill, 9 St James Terrace, Farnham, Surrey, GU9 7JT
- Mr K W Parry, Conoco Ltd., Conoco Centre, Warwick Technology Park, Gallows Hill, Warwick, CV34 6DA
- Petroleum Review April 1993

- Mr G A Peckham, 43 Earls Hall Avenue, Southend-on-Sea, SS2 6PB Mrs G M Pile, Simon Petroleum Technology, Reservoir & Production
- Services, Chapel House, Liston Road, Marlow, Bucks, SL7 1XJ Mr G Prince, ISL Instrumentation Ltd., 8 Claire Court, Rawmarsh
- Road, Rotherham, S Yorkshire, S60 1RU
- Mr H Quattlebaum, 19 Duncan House, 7 9 Fellows Road, London, NW3 3LS
- Mr D A Reid, 8 Crystal Avenue, Hornchurch, Essex, RM12 6AB
- Mr M Rosenberg, 414 Lovell St, Worcester, MA 01602, USA
- Mr B Sadler, 97 Dock Road, Grays, Essex, RM17 6EY
- Mr J P Shute, Enterprise Oil plc, Grand Buildings Trafalgar Sq, London, WC2N 5EJ
- Mr D Tabarelli, via D. Manin 23, 40129 Bologna, Italy
- Miss J L Thomas, Petrolite Ltd., Kirkby Bank Road, Knowsley Ind Park (North), Liverpool, L33 7SY
- Mr R C Thompson, 11 River House, 23-24 The Terrace, Barnes, London, SW13 0NR
- Mr B Todson, Davoser Weg 7, 7000 Stuttgart 75, Germany
- Mr G Tyers, Cenelectrex Ltd., Van Gaver Hse, 48-50 Bridgford Road, West Bridgford, Nottingham, NG2 6AP
- Mr M Varana, The Dairy Cottage, Kaims Hill, Letham Grange, Arbroath, Angus, DD11 4QY
- Mr M J Vickars, VW Consultants Partnership, 33 Wallace Fields, Epsom, Surrey, KT17 3AX
- Mr W G Warren, Warren Design, 5 Barkhart Gardens, Wokingham, Berks, RG11 1ET
- Miss K M Willox, 8 Linksfield Road, Aberdeen, AB2 1RU
- Ms K M Wilman, Ove Arup & Partners, 13 Fitzroy Street, London, W1P 6BQ
- Mr A Wyllie, 9 Southend House, Southend Road, Stanford-le-Hope, Essex, SS17 7AJ

#### Students

- Mr J M Blakelock, 52 Northampton Road, Croydon, Surrey, CRO 7HT
- Miss S Chauhan, 133 Charlton Road, Kenton, Harrow, Middx, HA3 9HT
- Mr M A Eshati, 43 Ashdown Road, Hillingdon, Uxbridge, Middx, UB10 0ER

#### New Collective Members

#### Schlumberger (Evaluation & Production Services UK Ltd)

Newton Road, Kirkhill Industrial Estate, Dyce, Aberdeen AB2 0EG IP Nominated Representative:Mr R H King

Schlumberger (Evaluation & Production Services UK Ltd), a subsidiary of Schlumberger Ltd, provides specialised technical well services to the oilfield exploration and production industries.

#### **R M Consultants Ltd**

Suite 7, Hitching Court Abingdon Business Park, Abingdon, Oxfordshire OX14 1RA

- IP Nominated Representative: Dr J Fitzpatrick, Managing Director
- RM Consultants Ltd provides professional servcies in the fields of safety and risk assessment, including availability, reliability and maintenance studies. A number of such studies have been carried our for most of the organisations in the oil and gas industry. The company has some 50 professionally qualified engineers and scientists and operates a quality assurance regime to BS 5750 standard.

### . . . appointments/consultants

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The Centre for Petroleum and Mineral Law and Policy has obtained funding from BP for the above position to complement the restructured interdisciplinary graduate degree programme at the Centre, combining law, policy and economics and focusing on natural resources, energy and environment. The candidate should have an academic and, if possible, also a practical/professional background in the economic and policy aspects of the UK, European and international oil and gas industry.

The post is, at present, available for up to four years. Extension will require maintenance and expansion of current funding arrangements. Informal enquiries may be made to Professor Thomas Walde, Director of the Centre, tel 0382 307300.

Further particulars from, and applications in the form of a CV (10 copies) together with the names and addresses of 3 referees, to the Personnel Office, The University, Dundee DD1 4HN, tel 0382 23181 ext 4015. Please quote reference EST/11/93/PR. Closing date: 15th April 1993.

The University is an Equal Opportunities Employer.



### 1993 CONFERENCES

April 29	Petroleum Retailing:
	The Environment, Regulation
	and Profitability Conference
May 19	Improving Oil Industry Cost
	Competitiveness through the
	Logistics Chain Conference
May 25	Petroleum-Based Land
	Contamination Conference
June 8	Current Developments in
	North Sea Drilling
	Operations Conference
June 23-25	Introduction to Oil Industry
	Operations Course
June 28-30	Introduction to Petroleum
	Economics Course

#### Autumn Conferences

**Economics of Refining Conference** 

New Developments in Tank Calibration and Meter Proving Conference

Personnel, Education and Training Conference

The Information Centre of the 1990s Changes, Challenges and Choices Conference

Gasoline Vapour Emission Controls Conference

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

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### **CONSULTANT LIST**

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

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

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

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

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