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Contents

Cover photo of Simon Storage's pressure storage at Immingham, South Humberside. Photo by Geoffrey Pass.

. . . news in brief

14 June

A £235m expansion of the chemicals plant at Mossmorran, Fife, is set to go ahead after the chemicals division of Exxon was granted outline planning permission.

Oil production at Elf Aquitaine's Gabon subsidiary is fully restored following a steep cutback during riots in May.

Three major Japanese city gas companies have reached agreement with Pertamina for imports of about 300,000 tonnes of LNG beginning in the 1994 financial year.

South Korea will build nine more power plants by 1993, mostly to be fuelled by LNG.

Saudi Arabia has launched a new shipping fleet to carry its petrochemical exports.

15 June

British Petroleum has found oil in the central North Sea in a licence block close to the median line with Norway.

Hamilton Oil Great Britain Plc is to receive ECU54m from the European Investment Bank towards the cost of developing the Bruce condensate gas field in the northern basin of the North Sea.

Exxon Corp has reached agreement with the New Jersey department of Environmental Protection to spend about $5m on pollution improvements at the Bayway refinery in Linden, New Jersey.

18 June

The UK government has rejected calls to increase the number of special oil recovery ships stationed in UK waters, despite the increase in spillages worldwide.

Iran agreed to pay Amoco $600m for Gulf oil field operations expropriated during the 1979 revolution.

19 June

Magistrates at Birkenhead fined Mobil Oil £1,750 after it admitted polluting a two-mile stretch of the Mersey.

Sun Co reported that it would no longer look for oil in the Sudan because of disappointing results.

Exxon Corp reported that a fire shut the only catalytic cracking unit at the company's 130,000 b/d refinery in Benicia, California.

20 June

Conoco has bought the UK offshore assets of Triton North Sea Operators part of Triton Energy for £35.6m.

Engelhard Corp plans to open the first plant in Venezuela to produce catalysts used in the oil industry.

21 June

Lloyd's Register has qualified with the Chinese Ministry of Energy to certifiy offshore oil and gas installations in the country.

The Kuwait Oil Minister was moved to the Finance Ministry. Sheikh Ali Khalifa al-Sabah was replaced by Mr Rashid Salim al-Ameeri.

Oryx Energy announced an oil and gas discovery in the Gulf of Mexico.

Shell Overseas Trading Ltd completed the acquisition of a 51 percent shareholding in China Gulf Oil Co Ltd from Gotco Ltd.

The Abu Dhabi government has approved plans for a massive development of the emirate's onshore gas resources.

22 June

The Indian government announced measures to curb consumption of petroleum products in an attempt to reduce oil imports this year by 2.8m tonnes and save Rs8.5bn in hard currency.

National Power Plc reported that its British Electrical International unit has won a £5m contract to provide technical and managerial assistance to Nigeria's National Electricity Power Authority.

25 June

ICI wants to distribute its 25 percent stake in Enterprise Oil to its own shareholders, rather than sell the £750m holding to an investor who could use it to bid for the independent oil and gas explorer.

BP Exploration announced six major construction contracts for the North Sea Bruce development, worth a total of about £180m.

Nigeria is to step up its oil exploration in the Chad basin despite the failure of the first 12 wells to uncover any commercial quantities of crude.

Norway's government have formally approved plans by Statoil to build a new terminal for receiving condensate from the Sleipner gas field.

26 June

Occidental Petroleum has lifted the estimated oil reserves in the Saltire field by 30 percent, and plans to seek development approval later this year.

Venezuela is planning to extend the San Jose agreement, under which it supplies Caribbean and Central American nations with crude oil, to include Haiti and possibly Cuba.

27 June

British Petroleum announced that is to move forward with plans to build an artificial island to exploit a 100m barrels of oil reserves underneath Poole Bay, off Bournemouth.

National Power was fined £1,500 by Dartford magistrates after it admitted allowing oil to seep into a creek which feeds the Thames near Dartford.

Elf Aquitaine plans to spend NKr10bn developing small oil and natural gas reserves near its Frigg field, off Norway.

28 June

Elf Aquitaine has indirectly entered the UK industrial gas market by acquiring a 40 percent stake in Associated Gas Suppliers.

Petroecuador is scheduled to assume control of oil production facilities operated by Texaco since 1977 in a move that will put 100 percent of the country's oil production in the hands of the state.

29 June

The UK government has launched a scheme to help small companies with up to 75 percent of the development costs of new oil and gas technology.

Ecuador will open its seventh round of oil exploration bidding at the end of 1990 covering 600,000 hectares of land in the Amazon region's north and northeastern zones.

Safety Kleen Corp reported that it would spend $40m to build the world's largest waste oil refinery in east Chicago, Indiana.

2 July

A sharp rise in heavy fuel oil consumption in May and June is one of the first signs that competition is taking hold in the UK electricity industry.

The US Congress has rejected proposals backed by the administration to set limits on shippers' liability for oil spills, raising the prospect of more tanker owners turning their vessels away from US ports.

3 July

Voest-Alpine Intertrading has agreed a one-year barter deal worth $100m with Iran.

The Oil Ministry of the Yemen Republic has awarded a production-sharing agreement in the central Shabwa region to the Crescent Petroleum Co.

4 July

Iran's President informed the Oil Ministry to take immediate measures to produce unleaded petrol to protect public health and cut pollution.

5 July

The Dutch Economic Affairs Minister decided that NAM will be allowed to continue drilling in the environmentally sensitive Ijsselmeer even though it failed to meet conditions stipulated in the original licence.

A Peruvian subsidiary of the US based Callon Petroleum Co will search for oil in Peru's northern jungle.

6 July

Elf Aquitaine have completed negotiations to buy the British refining and marketing interests of Amoco.

Fina is following Shell and Elf in withdrawing directly-owned oil tankers from US ports because of penal damages wanted by the Americans in the event of pollution.

9 July

Conoco Inc plans to drill an onshore exploratory oil well in Alaska's Cook inlet basin this winter.

Wintershall has disclosed that it is seeking a 25 percent stake in the East German gas network operator Verbundnetz Gas.

The Spanish government have taken the first step towards lifting controls on gasoline, diesel and fuel oil prices, to bring Spain's heavily controlled market in line with the EEC.

10 July

Mobil Oil Corp has agreed to pump out a 14.5m gallon underground lake of fuel oil, gasoline and naphtha that leaked beneath streets from a terminal in Brooklyn, USA.

11 July

Romania's newly-elected government, pledged to introducing a market economy, said it was lifting subsidies on oil imports and almost doubling the price of petrol.

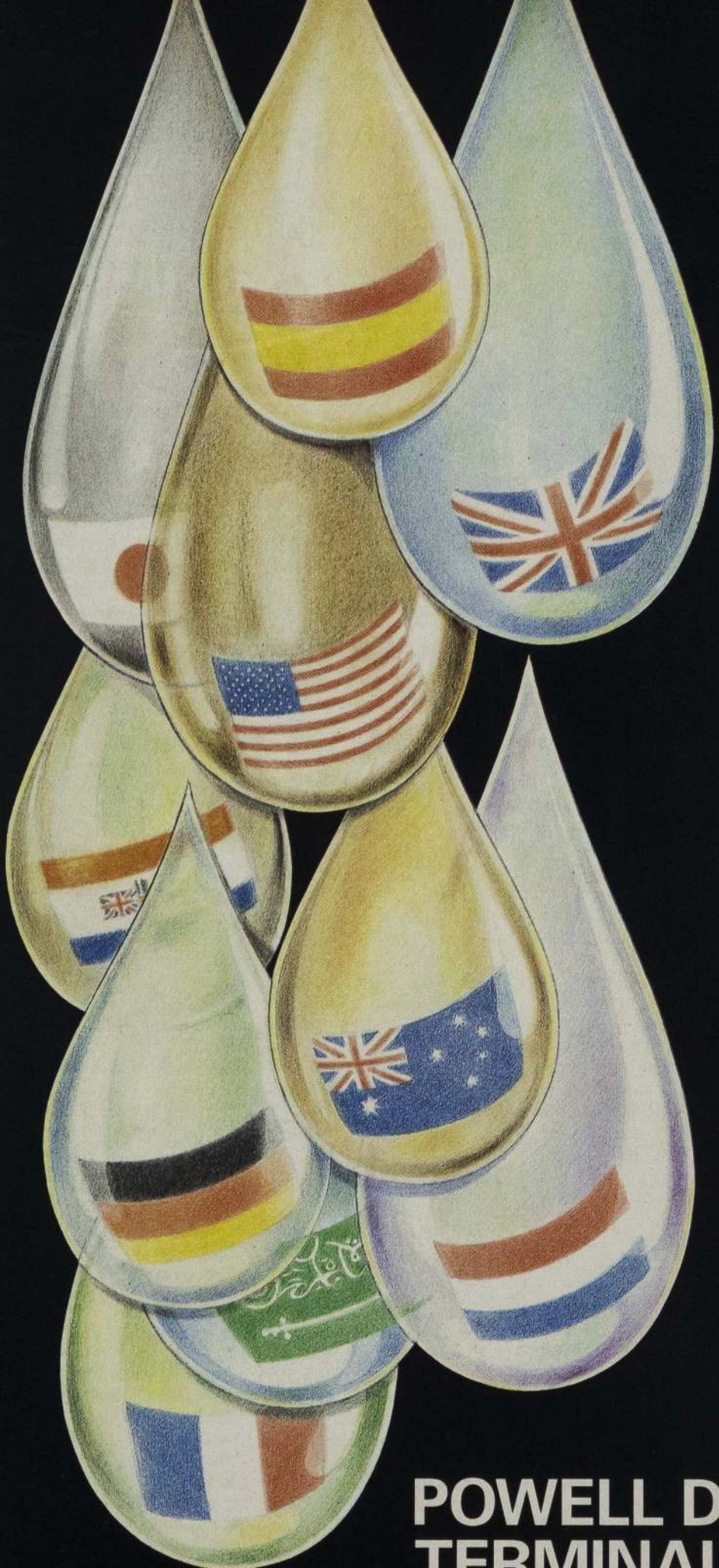
12 July

The Phillipines have scrapped plans to privatise Petron Corp.

13 July

A consortium of British and Italian engineering concerns has been picked to build the £450m production platform for the Tiffany oil and gas field in the central North Sea.

Unocal Corp has agreed to buy Amoco Production Co's 62.5 percent stake in the Chakachatna group of oil and gas properties in Alaska's Cook inlet.



Looking after liquids worldwide

Tank storage and terminal services at:

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POWELL DUFFRYN TERMINALS

North Sea only at 'half-way' stage

OFFSHORE activity on the UK Continental Shelf has just about reached the half-way stage, according to Dr Harold Hughes, Director-General of the UK Offshore Operators Association (UKOOA).

He estimates that there is another 25 years of work ahead in the North Sea and elsewhere on the UKCS and that exploration and production will continue deep into the next century.

His association predicts that drilling activity, coupled with the exploitation of oil and gas fields already discovered during the past 25 years of work in the North Sea, will lead to the development of between 100 and 300 new fields.

The predictions come as a result of a UKOOA technical study, which showed that the United Kingdom should be able to maintain self-sufficiency in oil until at least the end of the decade.

Speaking about the report at a *Financial Times* conference, Dr Hughes also predicted a rosy future for the production of gas.

'Our technical study shows expectations of being able to raise gas production by 50 percent, but here, of course, production is geared directly to the market available.'

But he added that: 'The demands of British Gas and the emerging competitive sellers of gas are added to by the considerable interest in gas as a fuel for power generation.

'Quite a number of gas-fired power generation projects are currently being considered; while not all of them will proceed, moves to make greater use of this valuable fuel, valuable as much else just for its environmental qualities, will certainly gather momentum.'

The study predicts that over the next two decades something in the order of 1,300 new exploration wells and around 1,000 new appraisals will be drilled.

He added that these figures do not include the new Western waters or frontier areas.

'Admittedly these fields will be smaller than those which were developed early in the last 25 years, but they will require high technological input and will make strong demands on the industry to achieve, individually, economic viability,' he said.

Brent to blend with Ninian

BP Exploration and Shell UK Ltd have announced that they have agreed to widen the Brent oil supply to ensure the long-term future of its market.

From 1 August, separate crude from BP's Ninian and Shell Brent pipeline will be mixed to form a single crude, known as the Brent Blend.

Both operators hope that the agreement will eventually almost double supplies available in the Brent market, so ensuring continued security of supply and reliable quality.

Negotiations, led by Shell and BP, involved more than 30 companies before the blend received a 'heads of agreement' approval for loading at BP's Sullom Voe terminal.

The move comes at a good time, for over the next few months extensive shutdowns of fields are planned in both the Brent and Ninian systems to meet legislative requirements related to the installation of emergency shutdown systems at platforms and other maintenance work. These shutdowns have been planned so that neither Brent nor Ninian will be taken out of service at the same time.

Brent is currently fed by the following fields; Brent, Cormorant, Deveron, Don, Dunlin, Eider, Hutton, NW Hutton, Murchison, Tern and Thistle. Ninian is fed by; Alwyn North, Heather, Magnus and Ninian.

Texaco's power plans

Texaco Ltd and Mission Energy Co (UK) Ltd are looking into the feasibility of a combined heat and power project adjacent to Texaco's Pembroke refinery in South Wales.

The proposed CHP (or cogeneration) plant, with a capacity of 1,100 MW, would be fuelled by both natural gas and refinery-derived fuels in gas-fired combustion turbines. Texaco and its partner, Californian-based utilities company, Mission Energy, are currently negotiating for gas supplies.

At Pembroke, Texaco intends to use some of the heat from the gas turbine exhaust to provide high pressure steam for the refinery's process operations. The bulk of the power generated would be supplied via the national grid to three regional electricity companies — South Wales Electricity, London Electricity and Southern Electric.

These companies are currently negotiating to take a stake in the proposed power station.

New university chairs

TWO oil groups have donated nearly £6 million to fund professorial chairs at five British universities.

The Occidental Consortium is to provide £400,000 for Aberdeen University to finance the initial four years of the first Chair of Safety Engineering in the United Kingdom.

BP is to endow four university chairs with £5.3 million. The endowments are for Organic Chemistry at Cambridge, Inorganic Chemistry at Imperial College, a visiting professorship at the London School of Economics, and Information Engineering at Oxford.

Mr Glenn Shurts, Occidental's UK President, said: 'We are proud to be supporting this important initiative of Aberdeen University.

'Our involvement with the Chair of Safety Engineering is a long-term investment which will benefit the future safety of industry offshore and throughout the United Kingdom.'

The Chairman of BP, Mr Robert Horton, said: 'The funding of these four important universities is intended to encourage superb education as well as top quality research in four important fields. I am proud that, in extending BP's commitment in this way, we are also continuing a long tradition of support for education in many ways.'

BP's endowment is believed to be the largest single commitment of funds to UK universities by a British company.

Interest reshuffle

NORSKE SHELL, which currently has interests in 25 licences on the Norwegian Continental Shelf, plans to rationalise its portfolio in an effort to concentrate and increase its interests in a smaller number of individual licences.

Norske Shell intends to offer interests in 11 licences and aims to increase its stakes in remaining licences, preferably by means of asset exchange.

Commenting on the proposed rationalisation, Paul Skinner, Managing Director of A/S Norske Shell, said 'The decision to rationalise our portfolio reflects a strategy of concentrating our business in areas where we feel we can add value, particularly in relation to our core assets'.

OSO's 'level playing field' policy

BRITISH offshore service firms could lose out after 1992 unless steps are taken to ensure fair commercial opportunities in the oil and gas markets, claims Mr John D'Ancona, Director-General of the Department of Energy's Offshore Supplies Office.

He warned that private sector UK companies may be undercut by foreign state-owned or subsidised firms or by vertically integrated corporations in member states.

Mr D'Ancona said the structure of these corporations could make it impossible to achieve the transparency needed to monitor new rules on public procurement, designed by the European Community to open up procurement according to economic rather than national criteria.

Speaking at the *Financial Times* North Sea Oil and Gas Conference, he said: 'Even as recently as this year we have found several cases of strong influence being brought to bear behind the scenes to place orders on a national rather than economic basis.

'The argumentation behind the procurement directives is that national clients tend to place work with national suppliers.'

Such were the problems facing the industry created by the single market that the OSO's role, which was thought to become redundant after 1992, will remain virtually unchanged in a bid to protect the UK's oil service industry's interest.

But he is optimistic. 'Our answer to Europe and to competitors throughout the world is simply 'catch us if you can' — on fair commercial terms. On a level playing field British industry can hold its own against any international competition across a very wide span of offshore activities.'

'The OSO will be an integral part of the UK effort and we shall continue to have the responsibility of ensuring fair commercial opportunity for British companies and of exposing cases where unfair practices persist in home, European or overseas markets.'

Jacket removal in Gulf of Mexico

INTERNATIONAL offshore contractor Rockwater has won an important contract for the abandonment of three platforms in the Gulf of Mexico.

The contract, which has been awarded by the Consolidated Natural Gas Producing Company, requires the development of new techniques for the transport of the jackets. The jackets will be suspended between two barges and towed to their final resting place.

The three platforms are located in 340 feet of water in the West Cameron Block 624; Eugene Island Block 392 and Ship Shoal Block 320 about 150 miles south west of New Orleans.

The Gulf of Mexico was one of the first areas in the world to produce oil and gas offshore and subsequently the first area in which offshore platforms have outlived their natural lives and are being scrapped. The three involved in the Rockwater contract are among the largest structures salvaged in the Gulf so far. The project is being run out of Rockwater's Belle Chasse office in Louisiana. Work started on June 15, and is expected to take about 50 days to complete.

Project manager Eric Romero said: 'The method we are using for the salvage of the jacket is unique. We will topple jackets on location, rig and lift them between the two barges and then tow them to the designated artificial reef site. I believe this is one of the first salvages to remove a jacket in such a fashion.'

Abu Dhabi contract

INTEGRATED Power Corporation has completed a major contract to provide 38 photovoltaic power systems for 19 sites in the Thammama 'C' gas field in the Abu Dhabi desert.

The sites are operated by ADCO, part of Abu Dhabi's national energy organisation. Each site uses two power systems, one to provide cathodic corrosion protection for the gas wellhead, another to power a SCADA (supervisory control and data acquisition) system.

Elf gas interest

Elf UK announces that it has acquired from Hadson Corporation of the USA its 45 percent interest in Associated Gas Supplies Limited (AGAS).

AGAS was established in 1988 as a joint venture between Hadson and Associated Heat Services plc to exploit opportunities to supply gas directly to industrial customers following the privatisation of British Gas.

The acquisition of an interest in AGAS provides Elf with an opportunity to take advantage of the competitive regime introduced by the British government to benefit industrial and commercial gas users.

LPG contract

WINCANTON Distribution Services have agreed in principle to sign an agreement with BP to distribute liquid petroleum gas products in South-West England and South Wales.

Operating out of BP's new LPG terminal at Avonmouth, the contract will run for two years.

Piper Alpha appeal

A DONATION of £40,000 made jointly by the Department of Energy and the Scottish Office has ensured that a bronze statue dedicated to the memory of the 167 men who lost their lives in the Piper Alpha disaster will be erected in Aberdeen.

Sullom Voe

The Sullom Voe Terminal in Shetland celebrated last month the processing of its four billionth barrel of North Sea oil which was achieved on 8 July.

BP built the terminal and operates it on behalf of more than 30 oil companies participating in the Brent and Ninian Pipeline Systems. It now accepts roughly half of all the oil produced by Britain's offshore fields.

The terminal's milestones began with the one billionth barrel in December 1982, the two billionth in May 1985 and the three billionth in October 1987.

Taiwan lubes

SHELL Overseas Trading Limited has completed the acquisition from GOTCO Ltd of their 51 percent shareholding in China Gulf Oil Company Limited.

China Gulf owns lubricants base oil manufacturing and blending plants located at Kaohsiung, Taiwan, Republic of China. The manufacturing plant has a base oil production capacity of 4,700 barrels per day, which will be increased to 5,200 barrels per day by the end of 1990. A new blending facility is also under construction. Approximately half the base oil production capacity is sold within Taiwan, the remainder is exported.

INDEPENDENT STORAGE

European capacity decreases

According to statistics received for Petroleum Review's 1990 survey, the total capacity of independent bulk storage of oils and chemicals in Europe amounts to 31,700,042 cubic metres, down 1,008,558 cubic metres on last year's figures of 32,708,600 cubic metres.

The Netherlands again heads the list of total storage capacity with 10,036,977 cubic metres, followed by France with 6,443,000 cubic metres.

From the information made available Belgium, France, the Netherlands and the United Kingdom all experienced a drop in capacity.

On the other hand Italy, Spain and West Germany's capacities were all up on last year, with West Germany in particular showing a marked 969,400 cubic metre increase.

Statistics of Petroleum Bulk Storage Owned by Independent Companies in Western Europe

COUNTRY	CAPACITY (m3) 1990	% OF TOTAL	CAPACITY (m3) 1989
Belgium	2,337,500	7.4%	2,478,300
Denmark	358,000	1.1%	358,000
Eire	28,500	0.1%	28,500
France	6,443,000	20.3%	7,686,300
Italy	182,500	0.6%	172,500
Malta	245,000	0.8%	245,000
Netherlands	10,036,977	31.7%	10,399,760
Portugal	87,000	0.3%	87,000
Spain	183,675	0.6%	178,650
Sweden	1,599,000	5.0%	1,599,000
Switzerland	346,000	1.1%	346,000
UK	4,358,490	13.7%	4,604,590
West Germany	5,494,400	17.3%	4,525,000
Total	**31,700,042**	**100.0%**	**32,708,600**

INDEPENDENT STORAGE

Forty-nine international companies are listed in the 1990 Petroleum Review summary of bulk storage in Western Europe.

ALDER SpA

Riva Cadamosto 6, 34147 Trieste, Italy.

Tel: **(040) 820290/822220.** *Telex*: **460374 Alder I.** *Fax*: **(040) 815365**.

The chemical terminal nearest to Central Europe on the Adriatic Sea. Thirteen tanks for flammables, total 6,500 cu. metres and eleven tanks for corrosive chemicals, total 6,000 cu. metres. Private berth for up to 10,000 tons dwt tanker ship, 24 ft. Access by road, rail. Out of custom area.

ANTWERP GAS TERMINAL VOF

Land Van Waaslaan 3, 2748 Beveren-Kallo, Belgium.

Tel: **(3) 755 10 09**. *Telex*: **73153**. *Fax*: **(3) 755 03 25**.

The terminal is situated on the left bank of the River Schelde behind the Kallo Lock. Four berths are provided, two for ships and two for barges. Vessels up to 75,000 cu. metres can be accommodated. Tankage consists of two fully refrigerated tanks of 50,000 cu. metres each, designed to handle propane and butane and four pressurised spheres of 3,300 cu. metres each, designed to handle propane, propylene, butanes, butadiene, butylenes and VCM. Four additional pressurised spheres have been constructed, completed in May 1990.

The terminal can offer a full range of services including receipt and despatch by ship, barge, rail and road tanker, ship to ship transfers and refrigerated to pressurised movements via fired heaters. Pipeline transfers as from 1990.

The terminal is strategically positioned to give ready access to a large market area via road, rail, canals, rivers and coastal movements.

BARROW STORAGE CO LTD

Head Office: 25 Fitzwilliam Square, Dublin 2, Eire.

Tel: **(0001) 763524**. *Fax*: **(0001) 614704**.

Three installations: One at Marshmeadows, New Ross, Co. Wexford, Eire. Storage for 16,000 cu. metres of petroleum products, including LPG. The berth on the River Barrow provides for vessels up to 8 metres draught. Tankage includes 4,500 cu. metres tank which is heated and insulated. One at Dundalk with 2,500 tons of gas oil and kerosene. A sea fed chemical storage plant in Tivoli, Cork with 2,000 tons of caustic liquor soda and plans for further chemical, oil and LPG extensions.

BRAGTANK AG

Head Office: Westquaistrasse 12, CH 4019 Basle, Switzerland.

Tel: **(61) 65 44 22**. *Telex*: **963180**. *Fax*: **(061) 651692**.

Bragtank, a member of the Van Ommeren Group, has one installation in Switzerland.

Basle: The terminal has 63 tanks with a total capacity of 346,000 cu. metres. All mineral oils can be stored. There are six jetties for barges. Access is by river, road and rail. Steam and oil heating is provided and there are bunkering facilities for barges.

BRITISH FUELS LTD

Daniel Adamson Road, Weaste, Salford M5 2DX, UK.

Tel: **(061) 736 8111**. *Telex*: **668620**. *Fax*: **061 745 8162**.

Provides storage facilities of 12 tanks, each of 2,000 tonnes, with a total capacity of 24,000 tonnes, for residual and distillate oils. Mild steel tanks, lagged tanks with coil heating and facilities for storing low flash point liquids. Access by road (into standard or specialised petroleum liquid storage); rail (offloading of 1,000-tonne liner trains); and sea (offloading of up to 6,000 tonnes from sea-going tankers).

BTP STORAGE LTD

Hayes Road, Cadishead, Manchester M30 5BX, UK.

Tel: **(061) 775 3945**. *Telex*: **669938**. *Fax:* **(061) 775 3970**.

Part of the British Tar Products group of companies. The installation occupies a 20-acre site on the north bank of the Manchester Ship Canal. Total tank capacity of over 100,000 cu. metres with a range of tanks up to 6,000 cu. metres capable of handling most types of petroleum and chemical products. Blending, packaging, drumming, and weighbridge facilities available. Rail sidings for up to 1,000 tonnes. Berth: maximum draught 24.5ft. approximately 8,000 tonnes. Easy access to the M6, M62 motorways.

COMOS TANK B.V.

. .Octaanweg 14, 1041 AN Amsterdam, Netherlands.

Tel: **(20) 114747**. *Telex*: **13121**. *Fax*: **(20) 119 364**

A subsidiary of VTG Vereinigte Tanklager und Transportmittel GmbH. Operates a terminal with an overall capacity of 650,000 cu. metres for storing all petrochemical liquids and solvents. Tanks range from 3,500 to 40,000 cu. metres, some coated or insulated and equipped with heating-coils. Blending facilities for gasoline and gasoil and facilities for leading, product-washing and butanising are available. Three jetties for seagoing vessels and eight jetties for barges, together with rail and road tanker filling platforms, ensure efficient storage and transfer.

COMPAGNIE INDUSTRIELLE MARITIME (CIM)

36, Rue de Liège, 75008 Paris.

Tel: **Paris (1) 4387 3349**. *Telex*: **280330 CIMDGPA**. *Fax*: **Paris (1) 4387 4308**.

Contacts: Mr B Salaun (Adjoint au Directeur Commercial) *Direct line*: **Paris (1) 4387 4314**. Mr CN Malcolm (CIM UK Representative) *Tel*: **0793 30151**.

CIM is an independent French company which owns and operates a modern and highly sophisticated storage, transhipment and break-bulk facility capable of handling crude oils, straight run fuels, distillates and all clean petroleum products. The complex, which is situated in France at **Le Havre** and **Antifer**, has a total capacity of some five million cubic metres. At Antifer, only crude oil tonnage in excess of 250,000 tons dwt is handled with the port being able to handle the world's largest tankers. At

Le Havre, the smaller crude oil carriers (under 250,000 tons dwt), light distillates and all other clean petroleum products are handled.

There is a pipeline link allowing cargo to be transferred from Antifer to Le Havre (where it can be back-loaded after storage if required). All cargoes stored and handled are in a Customs Bond and CIM prides itself on maintaining their clients' confidentiality. CIM has repurchased all assets owned by SOGESPA. Consequently SOGESPA no longer exists and CIM now owns all equipment at the Antifer Terminal, which consists of two crude oil terminals with an overall capacity of 955,000 cu. metres. Six tanks of 150,000 cu. metres each, and two of 22,500 cu. metres each. Access is by sea and pipeline. Seaberths with draughts of 98ft and 82ft respectively. Facilities for discharging ULCC-type vessels up to 550,000 MT and for transhipments.

DEPOTS PETROLIERS DE FOS SA

2.1 Secteur 81-Audience 818, Fos-sur-Mer, 13270 France.

Tel: **(33) 4247 6500**. *Telex*: **430235**. *Fax*: **(33) 4205 1154**.

DPF, a company in which the Van Ommeren-Cetteco Group has a share, has one installation in France, at Fos-sur-Mer. The terminal has thirty-six tanks with a total capacity of 719,000 cu. metres. All mineral oils can be stored. There are five jetties for sea-going vessels (up to 72ft) and one for coastal vessels (21ft). Access is by sea, rail, pipeline and road. Blending facilities are provided (MTBE, lead, butane).

DUPEG

Terminal: Tankweg 4, D-2103 Hamburg 95, West Germany.

Tel: **(40) 740 1654**. *Telex*: **217656**. *Fax*: **(40) 740 1703**.

The highly-sophisticated specialized independent tank storage terminal is situated favourably at the Western entrance of the Port of Hamburg in the New Petroleum Port, and closely linked to European Highway 3 (Scandinavia–Portugal) and to Europe's biggest marshalling yard by own 2.5km rail siding for complete rail units. Three jetties are available for ocean-going tankers, coasters and barges, six truck stations. The terminal operates more than 100 tanks with an overall capacity of 102,000 cu. metres ranging from 50 to 10,000 cu. metres, of which 8,000 cu. metres are stainless steel and 30,000 cu. metres specially coated (epoxy, zincsilicate, vinyl and others) for handling all liquids: chemicals, petrochemicals, edible and technical alcohols, lyes, acids, phenols, cresols, paraffin, slurry, turpentines, vegetable and animal oils — low and high flash point liquids. Each storage tank has its own pump and pipe-line to jetties and loading stations. All tanks are equipped with modern systems for temperature and level control. All pipe-lines are stainless steel.

Special services for trans-shipment, storage and treatment: heating, mixing, filtering, clarifying, standardizing, stationary nitrogen supply to tankers, tank trucks, tank waggons and storage tanks, barrelling (up to 2,000 barrels/shift), bonded custom-sealed storage, vapour return line, fresh water supply.

Dupeg Tank-Terminal is the authorized terminal in the Port of Hamburg to receive chemical slops (Marpol Annex II). New tank storage capacity of 25,000 cu. metres in high grade stainless steel is under construction and will be ready mid 1991.

ENEMALTA CORPORATION

Petroleum Division, PO Box 6, Hamrun, Malta.

Tel: **871443**. *Telex:* **1735/1219** *Fax:* **623055**.

Twenty-four tanks with a total capacity of 245,000 cu. metres. Eight tanks ranging in size from 10,000 to 20,000 cu. metres and 16 tanks from 5,000 to 10,000 cu. metres. Reception tank for clean ballast, maximum 4,500 tons. Gas oil, jet/kerosene, low viscosity fuel oil. Three berths for vessels up to 50,000 tons dwt; maximum draught 36ft; maximum length 750ft. Separate pipelines for each product, 12-inch to 18-inch. Simultaneous receipt/loading of products possible. Twenty-four hour, seven day service. Centrally situated in the Mediterranean. State-owned. Responsible for all import storage and distribution of petroleum products in Malta.

EUROGAS TERMINALS CV

Head Office/Terminal: Frankrijkweg 4, 4455 TR Nieuwdorp, The Netherlands.

Tel: **(0) 1196 12820**. *Telex*: **55684**. *Fax*: **(0) 1196 13444**

A subsidiary of Thyssen Bornemisza Group, Monaco.

The terminal has 130,000 cu. metres capacity for storage of LPG and chemical gases, six spheres of 3,369 cu. metres each, and two refrigerated tanks of 55,500 cu. metres each. There are three jetties for sea-going vessels and barges (draught up to 52ft). Board/board operations for a wide range of gases for vessels/barges are possible. Furthermore, there are facilities for the purging of vessels/barges/trucks/trains with nitrogen including flaring off. There is an open connection to the sea via the Westerschelde and there are good connections to the hinterland by rail, road and water.

Eurogas has expanded its services with the possibility of a practical and theoretical training at the terminal and with a consultancy for design/engineering/operations/start-up.

FLEET STORAGE CO LTD

Fleet Lane, Woodlesford, Leeds, West Yorkshire LS26 8AD, UK.

Tel: **(0532) 824396.** *Telex:* **55495**. *Fax:* **(0532) 827431**.

Situated adjacent to the Aire and Calder Canal some six miles south of Leeds. Has 15 tanks ranging from 350 to 3,000 cu. metres with a total capacity of 13,000 cu. metres. Storage available for both high and low flash petroleum products and heated fuel oils. All current tankerage of mild steel construction. Input handled by company's own fleet of rivercraft up to 550 tonnes cargoes from the Humberside area. Road input also available. Delivery to road vehicles by self-service meters rated at 2,000lpm through six loading bays. Vehicle parking, washing, bunkering and steaming facilities also available.

GAMATEX NV

Head Office: Scheldelaan, Kanaaldok B 2, B 2040 Antwerp (Lillo), Belgium.

Tel: **(3) 5684511**. *Telex*: **32459**. *Fax*: **(3) 5684595**.

Gamatex is a 50/50 joint venture between GATX Terminals Corporation and Van Ommeren-Ceteco and has one installation in Belgium.

Antwerp: The terminal offers 131 tanks with a total capacity of 484,500 cu. metres for mineral oils, pet-

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Paktank Nederland B.V.
Boompjes 60-68, 3011 XC Rotterdam
P.O. Box 102, 3000 AC Rotterdam
tel. (010) - 4002911
telex 22163
fax (010) - 4139829

Paktank Méditerranée S.A.
B.P. 87, 2048 Ariana
Tunisia
tel. 216-1-766629 –
766909 – 235825
telex 14895
fax 216-1-767470

Paktank Singapore Terminal (Pte) Ltd
The Chartered Bank Building 15-08
6, Battery Road, Singapore 0104
tel. 2258600
telex rs 55343 pt sing.
fax -65-2251497

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rochemical liquids and chemical gases. There are four jetties for sea-going vessels (draught 43ft) and two for barges. Access is by sea, rail and road. Tankage is insulated, coiled, coated and stainless steel with steam, warm-water and oil heating. Tanks for chemical products are equipped with dedicated pipelines and pump and most of them with vapour return. Pre-pump, blending, drum filling and nitrogen blanketing are also available.

GATX TERMINALS LIMITED

Nicholson House, High Street, Maidenhead, Berks SL6 1LQ, UK.
Tel: **(0628) 771242**. *Telex*: **847862**. *Fax*: **(0628) 771678**.

Formerly Unitank Storage Company and now a wholly owned subsidiary of GATX Terminals Corporation of the USA. Operates eight terminals in the UK. Subsidiary: Manchester Jetline Limited. Associates: Tees Storage Company Limited; Unitank Pencol Limited; Wymondham Oil Storage Company Limited; Fima Unitank SDN BHD, Malaysia.

Avonmouth, Bristol: Fifty-six tanks with a total capacity of 142,600 cu. metres, from 311 to 6,900 cu. metres in size, for high and low flash petroleum products, chemicals, molasses and oils and fats. Dock facilities comprise seven berths at the Royal Edward Dock (depth 32ft, maximum length 690ft, maximum beam 95ft), five piggable docklines (three 10in lines, one 24in line for molasses and one 8in s/s line) and 18 dedicated m/s lines. Distribution is through self-service road loading capable of handling 550 gallons per minute. Wensat pipeline connection. Access to British Rail network. Easy access to M4 and M5.

Belfast: Thirty-seven tanks with a total capacity of 35,290 cu. metres from 95 to 3,100 cu. metres in size for high and low flash petroleum products, chemicals, latex and oils and fats. There is one jetty on the Musgrave Channel (depth 30ft. maximum length 600ft, maximum beam 100ft), two 8in s/s docklines and separate lines for fuel oil, latex and tallow. All lines are piggable. Distribution is through self-service road loading capable of handling 550 gallons per minute. Easy access to M1 and M2.

Bromsgrove, Worcestershire: Rail-fed terminal. Nineteen tanks ranging in size from 35 to 1,350 cu. metres with a total capacity of 16,000 cu. metres, for high flash petroleum products. Capable of handling 1,400-tonne block trains. Distribution through self-service road loading facilities. Easy access to M5 and M6.

Eastham, Merseyside: Seventy-nine tanks with a total capacity of 276,700 cu. metres from 50 to 10,800 cu. metres in size in mild and stainless steel and aluminium, for high and low flash petroleum products and chemicals. Dock facilities consist of three berths in the QEII Dock (depth 33ft, maximum length 670ft, maximum beam 90ft) with seven piggable docklines (two 6in s/s lines, one 10in s/s line, one 10in m/s line, two 12in and one 14in). Distribution is through self-service road loading capable of handling 550 gallons per minute and rail sidings capable of loading and discharging 1,000-ton block trains. Easy access to M53, M56 and M6.

Grays, Essex: Fifty-two tanks with a total capacity of 311,000 cu. metres from 1,700 to 20,800 cu. metres in size, for high and low flash petroleum products and some chemicals. There are two jetties (Wouldham Nos. 1 and 2, depth 37ft at low water, maximum length 750ft, beam unrestricted) with five piggable docklines—three 10in, one 12in and one 14in. Road distribution is through self-service road loading. Rail sidings capable of loading 1,000-ton block trains. Easy access to M25.

Runcorn, Cheshire: Four tanks with a total capacity of 40,000 product tons for heated liquid sulphur. Dock facilities comprise one jetty on the Manchester Ship Canal. Distribution is through road loading on two automatic weighbridges. Easy access to M53, M56 and M6.

Leith, Scotland: Thirty tanks with a total capacity of 67,900 cu. metres, from 55 to 13,400 cu. metres in size for high and low flash petroleum products and chemicals. Dock facilities comprise one berth (depth 31ft, maximum length 650ft, maximum beam 100ft) with three mild and two stainless steel docklines. All lines are piggable. Distribution is through self-service road loading and rail. Access to M8, M9 and M90.

Wymondham, Norfolk: Eight tanks with a total capacity of 39,200 cu. metres from 4,100 to 5,200 cu. metres in size. High and low flash petroleum products on a co-mingled, throughputting basis. Distribution through fully automated road loading gantries at 55 GPM. Easy access to A11.

Manchester Jetline Limited: is proceeding with a project to supply Manchester airport with jetfuel by pipeline. The pipeline has already been laid. Once the project is complete the majority of UK refineries will be able to pump to the Airport.

GEBR BROERE BV

PO Box 150, 3300 AD Dordrecht, Netherlands.
Tel: **(78) 528528**. *Telex*: **29024/29393**. *Fax*: **(78) 179141**.

Operates two storage terminals in the Netherlands.

Dordrecht: 200,000 cu. metres capacity for chemical and petroleum products; tank sizes from 150 to 6,600 cu. metres. Tankage is mild steel, some insulated and coated; nitrogen blanketing facilities. Access by road, rail and sea via three deep-sea tanker jetties and four coastal tanker and barge jetties.

Rotterdam-Botlek: (*operated by Tank Terminal Rotterdam BV, daughter company*): 325,000 cu. metres capacity for the storage of chemical and petroleum products; tank sizes from 670 to 15,000 cu. metres. Tankage is mild steel, stainless steel, some insulated and coated; nitrogen blanketing facilities. Two deep-sea jetties for tankers up to 60,000 tons and two jetties for barges and coastal tankers up to 5,000 tons complement the road and rail access facilities.

GENERAL TANK STORAGE NV

Kaai 275-4de Havendok, 2030 Antwerp, Belgium.
Tel: **(3) 5411280**. *Telex*: **31643**. *Fax*: **(3) 5413163**.

General Tank Storage NV is the storage company for liquid chemicals and for mineral, vegetable and animal oils and fats.

There are 180 tanks ranging from 17 to 5,200 cu. metres, made from stainless or mild steel (with special coating on request) and heating, nitrogen atmosphere, mixing gear etc., if required. Total capacity is 288,000 cu. metres.

Facilities include more than 300 metres of wharf (36 feet deep), 1,200 metres of railway line, numerous loading points and 3 weighbridges.

An extensive network of pipes, allows unloading of up to 15 different parcels simultaneously. The customs and independent surveyors have

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Tuesday 6 November 1990

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The Conveyance Panel of the Institute's Marketing Sub-Committee, which has played a major role in establishing present-day safety standards in the transport of petroleum products by road, is organising this conference to provide a forum for the discussion of developments in this important area of oil industry activities which are being occasioned by a variety of factors, including advances in technology, the increasing awareness generally of safety and environmental issues and the imminence of 1992.

Among the topics to be discussed will be **designing for safety, operational safety, data capture and communications and driver training and assessment.** Each of these will be the subject of a number of separate papers on specific aspects of the topic. An Exhibition of manufacturers and suppliers of associated equipment will be held in conjunction with the Conference, at The Institute of Petroleum.

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. Telephone: **071-636 1004.** Telex: **264380.** Fax: **071-255 1472.**

Note change of Venue

LUNCHEON

Tuesday 27th November 1990
Grosvenor House, London

Mr Robert Horton
Chairman
The British Petroleum Co plc
will be the Guest of Honour and Speaker
on the subject of

'It's Not Easy Being Green:
An Assessment of Environmental Costs and Benefits'

For further information, and a copy of the ticket application form, which will be available shortly, please contact **Caroline Little,** The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR. Telephone: **071-636 1004.** Telex: **264380.** Fax: **071-255 1472.**

offices at GTS and the company has its own forwarding department. These permanent facilities ensure a quick and efficient despatch of products.

The GTS terminal is an ideal point from which to distribute goods in the northern part of West Europe. Its central location in the Antwerp harbour means maximum convenience for ships or lighters, particularly if bunkering is involved. GTS is located at less than 1 mile from the main motorway network.

HALTERMANN GmbH

Head Office: Ferdinandstr 55/57, D2000 Hamburg 1, West Germany.

Tel: **(40) 33380**. *Telex*: **2161815**. *Fax*: **(40) 3338214**.

Operates five terminals in Europe.

Hamburg-Wilhemsburg: Total capacity of 150,000 cu. metres, with tanks varying in size from 50 to 5,000 cu. metres, for all vegetable oils, petroleum products, solvents and chemicals. Some tanks are heating-coiled and insulated. Drumming and blending facilities are available. Access for ships, barges, road and rail tank cars and liner trains; two berths including a 33ft draught jetty.

Speyer/Rhine: Total capacity of 100,000 cu. metres, with tanks ranging in size from 250 to 3,000 cu. metres, for all petroleum products, solvents, chemicals and vegetable and edible oils. Some tanks stainless steel and coated; some with heating coils or insulation. Blending facilities and an associated custom processing plant available. Distribution by road, rail, liner train and barge.

Haltermann N.V. (Belgium) Ketenislaan 3 B-2748 Beveren/Kallo Linker Oever

Tel: **(3) 7500211**. *Telex*: **33705**. *Fax*: **(3) 7750261**.

All petroleum products, solvents, chemicals and vegetable oils can be stored in this 60,000 cu. metres capacity terminal. Tanks vary in size from 300 to 3,000 cu. metres. Some are stainless steel and coated with heating coils and insulation. Drumming and blending facilities are available, as is an associated custom processing plant. Access by road, rail and sea for vessels up to 28ft draught.

Haltermann A/S (Denmark) Søndre Molevej, DK-4600 Køge (near Copenhagen)

Tel: **(53) 653370**. *Telex*: **43565**. *Fax*: **(53) 657009**.

Tanks ranging in capacity from 20 to 4,000 cu. metres make up this 15,000 cu. metres capacity facility. All petroleum products, solvents and chemicals can be stored. Some tanks heating-coiled and insulated; drumming facilities. Distribution by road, rail and sea, with berths for 12,000 tons dwt tankers.

Haltermann A/B (Sweden) Petroleumgatan 5, S-21124 Malmö

Tel: **(40) 181220**. *Telex*: **32544**. *Fax*: **(40) 938485**.

This 20,000 cu. metres capacity terminal has tanks ranging in size from 20 to 2,000 cu. metres for all petroleum products, solvents and chemicals. Some tanks are stainless steel, coated, heating-coiled and insulated. Distribution by road, rail and sea.

HANSAMATEX KÖHN & KUYPER (GMBH & CO)

Head Office: Rethedamm 15, D 2102 Hamburg 93, FR Germany.

Tel: **(40) 751960**. *Telex*: **2163363**.

The major shareholder of Hansamatex is Van Ommeren Germany and a minority share is held by the Ulrich H Kohn GmbH.

Hamburg: The terminal has 300 tanks with a total capacity of 758,000 cu. metres for storing mineral oils, petrochemical liquids, liquid fertilisers, animal and vegetable oils and fats, and molasses. There are four jetties for sea-going vessels and barges (draught up to 44ft), seven berths for barges and coasters. Access is by road, rail and sea. Product lines are partly stainless steel. Tankage is insulated, coiled and coated, provided with steam and oil heating and partly equipped with nitrogen blanketing. Pre-pump facilities, drum filling plant, blending and dyeing facilities for gasoline and fuel oil are also available.

IBER TANK SA

Muelle de Inflamables, 08004 Barcelona, Spain.

Tel: **(3) 335 4066**. *Telex*: **53975**. *Fax*: **(3) 335 6283**.

Located at the Flamable's area of Barcelona's harbour with direct access by road (Motorway A-2), by ship (two jetties facilities up to 33 feet draft) and rail (under construction). Operates with 67 tanks, ranging from 30 cu. metres, capable of admitting practically all kind of chemicals and petrochemicals products as well as petroliferous (gasolines, gasoils, fuels, mineral oils, etc).

Suitable for transit operations and ship to ship transfers, using the free zone facilities.

IBL BULK LIQUIDS

110 Lime Street, Hull HU8 7AS, UK.

Tel: **(0482) 20736/7**. *Telex*: **592230**. *Fax*: **226162**.

132 storage tanks ranging from 50 to 830 cu. metres with a total capacity of 25,000 cu. metres. Specialises in the storage of non-hazardous chemicals, lubricating oil, additives and vegetable oils. The wharves are situated on the Hull river at Hull Forge Wharf and at 50–52 Lime Street, Hull. Facilities for receiving ex-road tankers or containers and good access to main roads leading to the M62. An 80 metre public weighbridge platform for weighing up to 60 tonnes and a road tanker steam-heating and cleaning service available on site.

THE INDEPENDENT TANK STORAGE ASSOCIATION (ITSA)

Executive Secretary: H.H. Cail, 24 Chiswick Quay, London W4 3UR UK.

Tel & Fax: **(081) 995 3393**.

The Association exists to give information and advice to government and other regulatory bodies in connection with the practical, safety and environmental health aspects of the bulk liquid storage business. Membership is open to all companies operating in the United Kingdom whose main business is storage of bulk liquids for third parties. A minimum capacity of 50,000 cu. metres is required for full membership. Associate membership is available to those with less than 50,000 cu. metres capacity. All companies with over that amount are currently members of ITSA.

KING'S LYNN STORAGE LTD

Head Office/Terminal: Estuary Road, King's Lynn, Norfolk PE30 2HH.

Tel: **(0553) 76382**. *Telex*: **817018**. *Fax*: **(0553) 767942**.

The terminal comprises 30 storage tanks in sizes ranging from 55 cu. metres to 1,500 cu. metres, with a total capacity of 20,000 cu. metres. It is served from Bentinck Dock, King's

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Lynn, where KLS has access to three berths by agreement with Associated British Ports. The port can accommodate vessels of up to 3,000 tons dwt. Five product lines lead to the terminal, which is approved for the storage of petroleum products and chemicals. Every tank is equipped with segregated pipelines and pumps for the discrete handling of products by road and sea. Three gantries provide 15 loading positions for road tankers. A substantial office building provides space for KLS's customers to install their own staff if necessary. Ample parking space for tankers and for barrels is provided on an adjacent two-acre site.

LA PETROLIFERA ITALO RUMENA SPA

Head Office: 40136 Bologna, Viale Aldini 190, Italy.

Tel: **(51) 331567**. *Telex*: **511549**. *Fax*: **(51) 332451**.

Terminal: Porto Corsini—Ravenna: Total storage capacity of about 100,000 cu. metres for petroleum products. Tanks between 500 and 15,000 cu. metres for low and high flash products. Storage and handling facilities for lubricants. Total storage capacity for chemical products has been increased from 60,000 to about 70,000 cu. metres during the first half of 1990. Tanks between 250 and 5,000 cu. metres for high and low flash products. Some tanks of stainless steel, some rubber or specially coated; nitrogen blanketing facilities; modern hot water system for accurate temperature control. Each tank has its own pump and line to loading racks and its own loading point, to avoid any risk of mixing or contamination. Two vessel berths, both of which can accommodate vessels up to 190m (623ft) in length and up to 8.5m (28ft) draught. Twenty-five pipelines, between 6ins and 12ins diameter (some insulated and of stainless steel) from berths to the storage tanks. Vessels can discharge several products simultaneously. Draught to be increased to 34ft by the end of 1991.

LONDON AND COASTAL OIL WHARVES LTD

Head Office: Hole Haven Wharf, Haven Road, Canvey Island, Essex SS8 0NR, UK.

Tel: **(0268) 682206**. *Telex*: **99104**. *Fax*: **(0268) 510095**.

Canvey Island Terminal: More than 100 tanks ranging from 45 to 20,320 cu. metres with a total capacity of 354,000 cu. metres. The full range of petroleum products is stored, including fuel oil, lubricating oils and automotive products. Jetty facilities are capable of handling vessels of up to 219m LOA. Delivery can be made from any tank to road tank wagons, water-borne vessels or drums. The installation is connected via UKOP to North London, London Airport (Heathrow), Birmingham and to the Government Pipeline and Storage System (GPSS). A large part of the company's throughput of gasolines, gas oils, aviation fuels and kerosenes is despatched by pipeline. Chemical storage facilities include stainless steel pipelines, lined, insulated and heated storage tanks and inert gas blanketing.

Dagenham Terminal: Situated between London and the Dartford Tunnel, this is the nearest major public storage terminal to London. The terminal now operates 236 tanks with a total capacity of 110,900 cu. metres. As well as the 26 new tanks commissioned in 1987, the company has recently acquired additional capacity at Dagenham including 58 tanks of less than 100 cu. metres capacity. Jetty facilities for vessels up to 228 metres LOA with additional berths for smaller vessels and barges. Full range of chemical storage facilities includes stainless steel tanks and pipelines, lined, insulated and heated tanks, and inert gas blanketing. The terminal handles a wide range of vegetable oils, edible oils and technical oils as well as chemicals and fuels. Facilities for bunkering vessels, blending products and filtering.

Both terminals have modern workshops, weighbridges, radio communications, fully computerised stock accounting and easy access to the M25.

Chemical analysis services: Include the testing of petroleum and chemical products to ASTM, IP and BS standards, now available at both terminals.

MATEX NEDERLAND BV

Head Office: 10 Westerlaan, 3016 CK Rotterdam, The Netherlands.

Telex: **21435 VO NL**. *Fax*: **(10) 464 2819**.

Commercial Department *Tel*:

Mineral oils **(10) 464 2337**

Chemicals **(10) 4729 799**

Edible oils **(10) 464 2829**

Matex Nederland BV is a member of the Van Ommeren Ceteco Group and operates four terminals in the Netherlands. The Matex worldwide storage capacity is 10,008,000 cu. metres. The 21 terminals are situated in 15 countries all over the world.

Matex Amsterdam B.V. Amsterdam: There are 198 tanks with a total capacity of 600,000 cu. metres for storing mineral oils and molasses. Mooring facilities consist of four jetties for seagoing vessels (draught up to 41ft) and seven for barges. Access is by road, rail and sea. There are 15 tanks of 8,500 cu. metres, all with floating roofs. Insulated coiled tanks equipped with steam and warm water heating are also available. Special services include washing, leading, blending and butanising facilities for leaded and unleaded gasoline, equipment to standardise and filter molasses, stabilising of gasoil and an inert gas supply.

Matex Botlek Rotterdam: This terminal has 313 tanks with a total capacity of 940,000 cu. metres for storing mineral oils, petrochemical and chemical liquids. There are six jetties for seagoing vessels (draught up to 41ft) and five for barges. Access is by sea, road and rail. Insulated coiled, coated and aluminium and stainless steel tanks are available and are equipped with nitrogen-blanketing and vapour-return facilities. Product lines are partly stainless steel. There are two 16inch pipelines to the Rotterdam Europoort installation and pipeline connection to adjacent refineries connected to the NATO pipeline system. Also available are blending facilities for fuel oil (bunkers) and dyeing and a drumming plant.

Matex Europoort B.V., Rotterdam: The terminal has 34 tanks with a total capacity of 740,000 cu. metres for storing mineral oils. Mooring facilities consist of one finger-pier for two VLCC-type vessels (draught 71ft), one jetty for vessels up to 45,000tons and five berths for barges. Access is by sea and road. All tanks are coiled, 24 have floating roofs and all operations are directed from the fully automated control room. Special services include washing, leading, blending and butanising facilities for leaded and unleaded gasoline. There are two 16-inch pipelines to the Rotterdam-Botlek terminal and pipeline connections to adjacent refineries con-

nected to the NATO pipeline system. **Matex Vlaardingen:** There are 360 tanks with a total capacity of 435,000 cu. metres. Vegetable and animal oils and fats and molasses are stored. There are three jetties for seagoing vessels, 10 for barges (all draught of 40ft). Access is by road, rail and sea. All tanks are equipped with heating coils and swing-pipes. Drumming facilities, weighing tanks and pre-pump containers for quality inspection are also available.

NOORD NATIE SV

Head Office: Stadswaag 7-8, B-2000 Antwerp, Belgium.

Tel: **(3) 2329940**. *Telex*: **31677**. *Fax*: **(3) 2333936**.

Situated in the port of Antwerp. There are 167 tanks ranging from 30 to 8,000 cu. metres, with a total capacity of 190,000 cu. metres for various bulk liquids including mineral and lubricating oils, vegetable and animal oils and fats, non-dangerous chemicals and molasses. All tanks equipped with heating coils. Two mooring berths for sea-going vessels and a special dock for handling barges. Direct road and railway connections. Three weighing bridges. Mobile pump facility. Drumming installation.

NORDIC TANK STORAGE AB

Grönsakstorget 2, S-411 17 Gothenburg Sweden.

Tel: **(31) 131950**. *Telex*: **27696** NORDIC S. *Fax*: **(31) 131955**.

Nordic Tank Storage AB run about 1.4 millions cu. metres independent tankspace for bulk liquid products in Sweden. This capacity is divided into 20 different terminals covering the whole coast of Sweden, appr. 300 tanks are operated. Nordic Tank Storage AB is the biggest independent tankstorage company in Sweden.

Gothenburg: Brannoljagatan, Skarvikshammen, S-417 34 Gothenburg, Sweden.

Tel: **(31) 34542933**. *Telex*: **27580**. *Fax*: **(31) 343449**.

The biggest independent terminal within Scandinavia. Operates 74 tanks ranging from 60 cu. metres to 25,000 cu. metres with a total capacity of over 500,000 cu. metres. The full range of petroleum products is stored, including gasoline, gas oil, fuel oils, lubricating oils and automotive products. Jetty facilities are capable of handling vessels up to 240m in length and up to 40ft draught with additional berths for smaller vessels and barges. The installation is connected to every terminal located in the oil harbour of Gothenburg where the big international oil companies have their own terminals and is also connected to BP and Shell refineries. Delivery can be made from any tank to road and railway tank wagons, waterborne vessels or drums. Each tank has its own pump and line to loading racks and its own loading point, to avoid any risk of mixing and contamination. Pump capacity up to 1,000 cu. metres per hour. Some tanks from 6,000 cu. metres have a floating roof. All tanks are equipped with a modern system for accurate temperature and level control. Ten pipelines between 6in and 20in diameter from berths to the storage tanks. Also available, blending facilities for gasoline, gas oil and fuel oils.

Possibilities to store in transit.

OIL RAIL TERMINALS (LEEDS) LTD

South Accommodation Road, Leeds LS9 0RT, UK.

Tel: **(0532) 480574**. *Telex*: **55435**. *Fax*: **(0532) 400762**.

Head Office: Hayes Road, Cadishead, Manchester M30 5BX.

Part of the British Tar Products group of companies. Thirty-two acre site only one mile from the M1 and M62 motorways. Liner trains of up to 1,000 tonnes are received in modern sidings and discharged in two hours. Equipped with high-speed, self-service road vehicle loading bays. Products stored in mild steel tanks ranging from 600 to 6,000 cu. metres, with a total capacity of 21,000 cu. metres. Complete range of low and high flash petroleum products.

OILTANKING GMBH

Headoffice: Admiralitätstraße 55, D-2000 Hamburg 11.

Tel: **(40) 37 0990**. *Fax*: **(40) 37 099 199**. *Telex*: **216 32 32**.

Oiltanking has a storage capacity of approximately 3.5 million cu. metres. The company operates five seaport terminals, designed for rapid handling, in **Amsterdam, Copenhagen, Ghent, Hamburg, Houston**. Two additional terminals with altogether 500,000 cu. metres in **Singapore** and **Malta** are under construction. Completion will be in early 1990. All terminals occupy key-positions in the international oil storage business and are backed by a dense network of inland tank terminals. Seaport tank terminals and inland storage facilities can be combined, permitting a wide variety of solutions for individual problems. The Amsterdam terminal in particular plays an important role in the distribution of high and low flash products in North-West Europe and the UK. Vessels up to 85,000 tons dwt are handled at this terminal and their cargoes redistributed on coasters and barges. Extensive product treatment facilities for the blending, leading and up- and downgrading of gasoline are also available. Since 1 April, 1989 the Amsterdam Terminal has operated a vacuum distillation for gasoil. Oiltanking is a member of the Marquard & Bahls Group.

West Germany

Hamburg: Forty-one tanks, sizes 2,000 to 19,000 cu. metres. Total capacity 418,000 cu. metres. Low/high flash petroleum products and heavy fuel oil storage. Sea/barge/rail/road. Berth for tankers up to 85,000 tons dwt.

Berlin: Thirty tanks, sizes 1,500 to 25,000 cu. metres. Total capacity 348,000 cu. metres. Low/high flash petroleum products. Barge/rail/road.

Karlsruhe: Thirty-five tanks, sizes 600 to 2,000 cu. metres. Total capacity 180,000 cu. metres. Low/high flash petroleum products, chemical products and LPG-storage (Gastanking GmbH). Barge/rail/road.

Bendorf: Twenty-two tanks, sizes 2,000 to 20,000 cu. metres. Total capacity 146,000 cu. metres. Low/high flash petroleum products. Barge/rail/road.

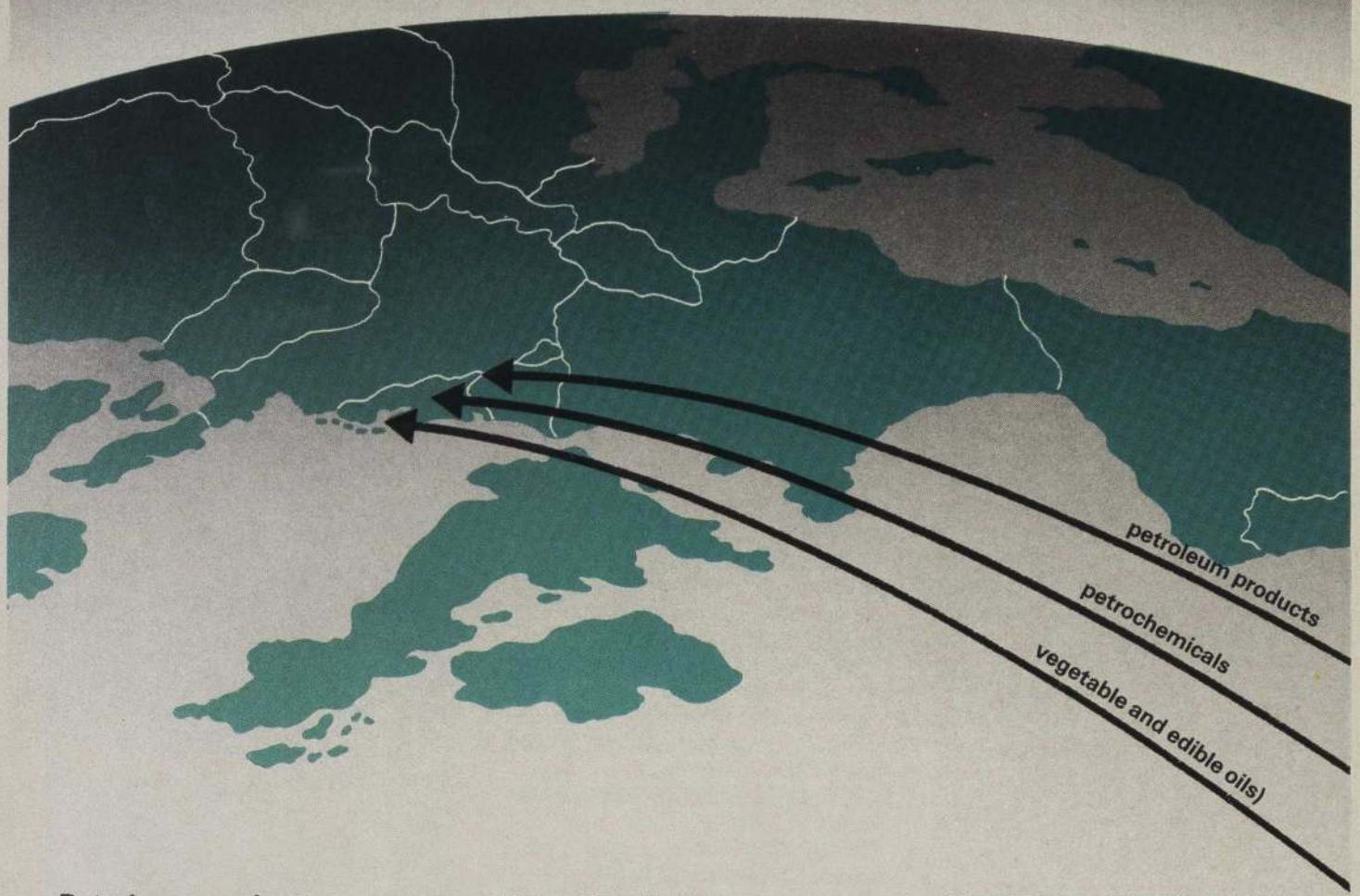
Frankfurt: Thirty-three tanks sizes 100 to 5,000 cu. metres. Total capacity 51,000 cu. metres. Low/high flash petroleum products and chemical products. Barge/rail/road.

Hanau: Eleven tanks, sizes 5,000 to 20,000 cu. metres. Total capacity 115,000 cu. metres. Low/high flash petroleum products. Barge/road/pipeline.

Hamm: Eight tanks, sizes 3,000 to 15,000 cu. metres. Total capacity 76,000 cu. metres. Low/high flash petroleum products, fertilizers. Barge/road.

Duisburg: Six tanks, sizes 5,000 to 10,000 cu. metres. Total capacity 35,000 cu. metres. Low/high flash petroleum products. Barge/road.

Matex entries to Europe



Petroleum products

- Capacity 1,500,000 cbm at Matex Europoort, Matex Botlek and Matex Amsterdam
- No length and draught limitations
- Product dedicated and piggable pipelines
- Pipeline connections to Rotterdam refineries and CEPS
- Washing, leading, blending, butanising and upgrading
- Floating roof tankage
- Insulated tanks
- Vacuum distillation

Petrochemicals

- Capacity 700,000 cbm at Matex Botlek
- No berthing limitations
- Tanks varying from 150 - 13,000 cbm
- Stainless steel, aluminium coated and mild steel tanks
- Product dedicated and piggable mild steel and stainless steel pipelines
- Drum filling facilities
- Loading facilities for road and rail tank cars
- Supply of nitrogen/steam

Vegetable and edible oils

- Capacity 635,000 cbm at Matex Vlaardingen and Matex Amsterdam
- All tanks equipped with heating coils
- Drum filling facilities
- Aluminium tanks with stainless steel pipelines
- Loading facilities for road and rail tank cars
- Tanks varying from 150 - 5,500 cbm

matex

Matex Nederland BV

Matex Nederland BV, PO Box 845, 3000 AV Rotterdam, telephones: 10 - 464 27 06 (petroleum products), 10 - 464 28 29 (vegetable and edible oil), 10 - 472 97 00 (petrochemicals), telefax 10 - 472 20 30 (petrochemicals only), 10 - 464 28 19 (other departments), telex 21435 vo nl access code matex+

The Netherlands
Amsterdam: Forty tanks, sizes 5,000 to 40,000 cu. metres. Total capacity 740,000 cu. metres. Low/high flash petroleum products/heavy fuel oil/ crude oil/components/feed stocks/ molasses. Sea/barge/road/rail (projected). Berth for tankers up to 85,000 tons dwt.
Belgium
Ghent: Thirty-eight tanks, sizes 3,000 to 46,250 cu. metres. Total capacity 600,000 cu. metres. Low/high flash petroleum products/feed stocks/ chemical products/ fertilisers/ edible oils. Sea/barge/rail/road. Berth for tankers up to 65,000 tons dwt.
Denmark
Copenhagen: Forty tanks, sizes 1,600 to 16,000 cu. metres. Total capacity 343,000 cu. metres. Low/high flash petroleum products/chemical products. Sea/coaster/road. Berth for tankers up to 40,000 tons dwt.

OMNI-TANK GMBH

Marienstraße 20 D-400 Düsseldorf 1
Tel: **(0211) 350515**. *Fax*: **(0211) 357697**.
Breisach: 23,400 cu. metres. 15 tanks ranging from 1,000 to 5,000 cu. metres for storing petroleum products. Access for barges and road tank cars.
Essen: 112,000 cu. metres. 40 tanks ranging from 600 to 5,000 cu. metres for petroleum products, chemical and petrochemical liquids and solvents. Insulated, coiled and coated tanks are available and equipped with dedicated pipelines, heating and blending facilities. Distribution by road, rail and barge.
Hanau: 54,000 cu. metres. 30 tanks for gasoline, gasoil, jet fuel and petrochemical liquids. Blending facilities are available. Access by road, rail and barge.
Karlsruhe: 51,000 cu. metres. 20 tanks ranging from 650 to 3,000 cu. metres for petroleum products and petrochemical liquids. Access for road and rail tank cars (liner trains) and barges.
Offenbach: 66,000 cu. metres. 24 tanks ranging from 1,500 to 5,000 cu. metres for petroleum products. Access by road, rail and barge.
Speyer: 796,000 cu. metres. 57 tanks ranging from 2,000 to 60,000 cu. metres for all petroleum products, chemicals and petrochemical liquids, liquefied gases and solvents. Blending and mixing facilities are available. Distribution by road, rail (liner trains), barge and pipeline (CEPS).

PAKTANK INTERNATIONAL BV

PO Box 7300, 3000 HH Rotterdam, The Netherlands.
Tel: **(10) 4002911**. *Telex*: **22163**. *Fax*: **(10) 4139829**.
The world's largest independent tank storage company, providing bulk storage and related facilities to the chemical and oil industries. Over 7 million cu. metres of tank storage capacity at terminals in Western Europe and further capacity in the USA, Tunisia and Singapore.
The Netherlands
Botlek (Rotterdam): 1,576,000 cu. metres capacity; access by sea, road, rail and pipelines; 39ft 6in draught sea berths; storage for petroleum products, chemicals and specialised liquids.
Europak (Rotterdam): 1,973,000 cu. metres; sea, pipelines; 68ft; crude oils and petroleum products. Able to receive vessels up to 72ft via the Maasvlakte terminal.
Laurenshaven (Rotterdam): 926,000 cu. metres; river, pipelines; petroleum products.
NOM/Pernis (Rotterdam): 319,163 cu. metres; sea, road, rail; 38ft 10in; petroleum products, chemicals, aromatics.
Maasvlakte Oil Terminal CV (Rotterdam): 360,000 cu. metres; sea, pipelines; 72ft; crude oils.
Sweden
Goteberg: 48,000 cu. metres; sea, road, rail; 36ft; petroleum products, chemicals, lubricating oils, molasses, latex.
Sodertalje: 108,000 cu. metres; sea, road, rail; 32ft; petroleum products, asphalt, chemicals, vegetable and animal oils and fats.
Malmo: 23,000 cu. metres; sea, road, rail; 36ft; asphalt, petroleum products, chemicals.
West Germany
Neuss: 58,000 cu. metres; river, road, rail; petroleum products, chemicals.
Tollerort and Hohe Schaar (Hamburg) and Kiel: See under VTG-PAKTANK HAMBURG GMBH.

PANOCEAN STORAGE & TRANSPORT LTD

Head Office: Chester House, Chertsey Road, Woking, Surrey GU21 5BJ, UK.
Tel: **(04862) 26241**. *Telex*: **859343**. *Fax*: **(04862) 25459**.
Provides storage and transportation services for handling and distribution of liquid products in bulk.
Operates bulk liquid storage installations in Belgium, Holland and UK, and the USA, with a total capacity of some 1.51 million cu. metres, handling chemicals, petroleum fuels, lubricating oils, latex and vegetable and animal oils. Has its own access by sea, road and rail as well as ancillary service possibilities in supplying nitrogen, large-scale drumming and canning.
Belgium
Eurotank (Antwerp): 469,000 cu. metres capacity. Tanks range in size from 100 to 50,000 cu. metres; stainless steel, aluminium, heated, coated and insulated. Facilities for blending and drumming together with dry cargo warehouse space.
Hemiksem (Antwerp): 120,000 cu. metres capacity. Tanks range in size from 33 to 5,500 cu. metres; stainless steel, aluminium, heated, coated and insulated. Facilities for blending, drumming and canning together with dry cargo warehouse space.
Netherlands
Botlek (Rotterdam): 206,600 cu. metres capacity. Tanks range in size from 365 to 10,000 cu. metres. Specialised tankage includes various categories of coated and insulated tanks with both mild steel and stainless steel heating coils.
Pernis (Rotterdam): 350,000 cu. metres capacity. Tanks range in size from 15 to 7,300 cu. metres. Specialised tankage includes aluminium, heated and coated tanks. Facilities for drumming, blending and clarifying.
United Kingdom
Birkenhead (Merseyside): 45,000 cu. metres capacity. Tanks range in size from 50 to 2,000 cu. metres; heated, coated and insulated. Facilities for blending and drumming.
Eastham (Merseyside): 85,000 cu. metres capacity. Tanks range in size from 50 to 3,500 cu. metres. Specialised tankage includes coated and temperature controlled tanks.
Hull (North Humberside): 13,400 cu. metres capacity. Tanks range in size from 20 to 1,200 cu. metres. Carbon steel insulated tanks.

PL TRANSTORE LTD

Riverside House, East Street, Birkenhead, Wirral, Merseyside L41 1BY, UK.

Tel: **(051) 647 4111**. *Telex*: **629574**. *Fax*: **(051) 666 2136**.

Our installation is based in the Birkenhead Dock system. We have 50 tanks ranging in size from 50 to 1,000 tonnes with a total capacity of 22,000 tonnes.

The storage tanks are mild steel vertical, lagged with steam heating coils. Access is by road and sea. Public weighbridge and tankcar washbay are also available.

Other facilities are blending, drumming, acid and water washing, fractionation using rotary vacuum filter, the extraction of oils and fats from all types of packages.

This is supplemented by a modern laboratory using modern analytical techniques.

We also operate a fleet of stainless steel general purpose road tankcars, fully fitted with pumps and compressors.

POWELL DUFFRYN TERMINALS LTD

UK Head Office: Powell Duffryn House, London Road, Bracknell, Berks RG12 2AQ.

Tel: **(0344) 53101**. *Telex*: **858906**. *Fax*: **(0344) 862571**.

Operates three terminals in the UK and one in Spain.

Barry, South Wales: High and low flash tankage, including pressure vessels, for petroleum and chemical products, with a total capacity of 206,600 cu. metres. Tank sizes from 60 to 14,400 cu. metres; mild steel—many lined, lagged and coiled, using stainless steel fittings where required. Eight tanker berths with a minimum depth of 9.8 metres (32ft), served by over 20 pipelines in stainless or mild steel, lagged and traced as required. Blending and drumming; weighbridge; road and rail facilities. This location is ideal for supplying the industrial areas of South Wales, the South of England, the Midlands and the North-West.

Ipswich, Suffolk: High and low flash storage; tanks from 100 to 10,000 cu. metres with a total capacity of 89,000 cu. metres for petroleum and chemical products. Mild steel tanks, lined, lagged and coiled. Three tanker berths with a minimum depth of 7.9m (26ft), using both stainless and mild steel pipelines; blending; road facilities.

Purfleet, Essex: Two jetties: the main seven-berth private jetty with a minimum depth of 10.6m (35ft) can accept vessels of up to 45,000 tons displacement or a maximum length of 800ft; a smaller chemical jetty upstream. High and low flash tankage for petroleum and chemical products, with a total capacity of 269,000 cu. metres. Tank sizes from 50 to 15,000 cu. metres; stainless or mild steel; many lined, lagged and coiled, using stainless steel fitments when required. Fourteen stainless and mild steel main pipelines; many are lagged and traced for temperature control. Full trainloads on 100-tonne rail cars and all types of road tankers; weighbridge; blending and drumming.

All three terminals offer terms for dedicated or commingled petroleum product storage.

Spain

Proquimica SA (for details, see under this company's own heading).

PROPETROL

Head Office: 65, Quai Jacoutot, BP 13, F-67013 Strasbourg Cedex, France.

Tel: **(33) 8860 0096** and **(33) 8860 0667**. *Telex*: **890619** and **880078**. *Fax*: **(33) 8860 6630** and **(33) 8861 0747**.

Contact: Mr E Elkouby (Directeur Commercial).

Propetrol, a subsidiary of the Petrofrance group of companies, is an independent petroleum and chemical storage company with terminals in: **Strasbourg** (three locations), **Village Neuf** (near Basel), **Gergy** (near Chalon-sur-Saône) and **Villeneuve-La-Garenne** (8 km north of Paris).

Together these terminals represent a total storage capacity of 168,000 cu. metres of bulk petroleum products, 32,000 cu. metres of bulk liquid chemicals and petrochemicals and over 7,000 sq. metres of warehousing for the storage of drummed and packaged chemicals.

All terminals are located on major waterways: Rhine, Saône and Seine Rivers, with complete rail and motorway access.

Services available: Tank-truck loading/unloading, heated and insulated tanks and pipes, tanks equipped with recirculating systems, tanks equipped with innerfloating screens, inert gas blanketing (nitrogen) petroleum products dyeing, blending of oils and fuels, heat supply, tank-truck weighing, bunkering of barges with tank-trucks and customs services.

PROQUIMICA SA

Head Office: Calle Orense 20, 28020-Madrid, Spain.

Tel: **(1) 5560752**. *Telex*: **43250**. *Fax*: **(1) 5560348**.

Terminal: Muelle de Inflamables 08004-Barcelona, Spain.

Tel: **(3) 3355812**. *Telex*: **53962**. *Fax*: **(3) 3355741**.

An independent company, associated with Powell Duffryn Terminals, with an installation in the port of Barcelona for the storage and handling of chemical, petroleum petrochemical and edible products.

Barcelona: 60,000 cu. metres for high and low flash, corrosive and other special liquid products in bulk. Tanks ranging from 50 to 3,000 cu. metres. Two berths (12 metres draught) operating 24 hours a day. Heating, blanketing, heat traced pipes, stainless steel tanks and pipes, coated tanks, blending, drumming facilities. Access by sea and road, rail under execution, ship to ship facilities. Authorised to store gases. Logistic and technical advice. In bond operations.

QUIMATEX LDA

Avenida Infante Santo 23-1 Esq., 1300 Lisbon, Portugal.

Tel: **(01) 669117**. *Fax*: **(01) 602612**. *Telex*: **43917 QMATEX P**.

The tank terminal, located in the Port of Lisbon, has a total capacity of 87,000 cu. metres for storing ammonia, chemicals and petroleum products. Maximum draught at the jetty is approximately 32ft at high tide.

THE ROSS CHEMICAL & STORAGE CO LTD

Dock Road, Grangemouth FK3 8UB, Scotland.

Tel: **(0324) 474774**. *Telex*: **777750**. *Fax*: **(0324) 485476**.

Grange Dock, Grangemouth: Sixty tanks ranging from 800 to 2,650 cu. metres, with a total capacity of 100,000 cu. metres, for fuel oil, motor spirit, petrochemicals, aviation fuel and molasses. Served by a common-user oil jetty with mild and stainless steel jetty lines. The jetty is capable of handling ships up to 20,000 tons dwt. Distribution by road. Office facilities and land available for expansion.

SIMON STORAGE GROUP LTD

Knowles House, Cromwell Road, Redhill, Surrey, RH1 1RU, UK.
Tel: **(0737) 778108**. *Telex*: **888744 SIMONSTO G**. *Fax*: **(0737) 778112**.

Simon Storage manage the bulk storage interests in the UK and Eire of Simon Engineering plc and Van Ommeren Ceteco NV. All enquiries regarding the operating companies should be addressed to Simon Storage.

Distribution Services/Facilities Management

Simon Storage provide aviation refuelling, into plane services, together with terminal and pipeline management on a contract management basis.

Cumbrian Terminal:
Prince of Wales Dock, Workington, Cumbria.
Tel: **(0900) 605151**. *Telex*: **64331 CSTORR G**. *Fax*: **(0900) 67986**.

33,500 cu. metres for petroleum products, liquid sulphur and chemicals storage. Transport by road, rail and sea. Ships Agency: Workington — can handle 10,000 tons dwt vessels and provides excellent port facilities for deliveries to or from North West England and Southern Scotland.

Immingham Terminals:
Immingham Docks, Nr. Grimsby, South Humberside.
West: *Tel*: **(0469) 572615**. *Telex*: **52291 ISCOL G**. *Fax*: **(0469) 577019**.
East: *Tel*: **(0469) 571241**. *Telex*: **527931 ISCEA G**. *Fax*: **(0469) 571037**.
Killingholme: *Tel*: **(0469) 40381**. *Telex*: **52291 ISCOL G**. *Fax*: **(0469) 41012**.

Operates three installations: two at Immingham Dock (East and West) and one at Killingholme. More than 300 tanks with a total capacity of 900,000 cu. metres, making it the largest independent bulk storage terminal in the UK. Included in this figure are pressure storage for gases, stainless steel, lined, lagged and steam heated tanks. More than 60 jetty lines including six stainless steel provide for excellent segregation of grades. Use is made of three jetties: Eastern, Western and one at Killingholme. The terminal is connected to the Humber refineries and chemical plants by pipelines. The jetties have 35ft draught and can accommodate up to 35,000 tons dwt tankers, coasters or barges. Transport by road, rail, sea and pipeline. The company has land available for expansion to meet customers' special requirements at both Immingham and Killingholme. New tankage under construction.

Seal Sands Terminal:
Seal Sands, Middlesbrough, Cleveland TS2 1UB.
Tel: **(0642) 546775**. *Telex*: **58218 SSTOR G**. *Fax*: **(0642) 546076**.

Wholly owned by Simon Engineering plc. Over 100 tanks with a total capacity of 196,400 cu. metres for petroleum products, chemicals including molten sulphur, VCM and propylene and a wide range of edible or specialist products. Two jetties, one taking vessels up to 30,000 tons dwt. The terminal is connected to local chemical plants by pipeline. Transport by road, rail and sea. Block trains handled.

Shannon Terminal:
Foynes Harbour, Foynes, Co Limerick, Eire.
Tel: **(010 353) 69 65506**. *Fax*: **(010 353) 69 65601**.

One installation. 12,500 cu. metres for petroleum and chemical products on the River Shannon. The jetty can accommodate 20,000 ton tankers and facilities are included for the loading to road tank wagons and the supply of products to barges at the jetty. Land available for expansion of the terminal.

Thames Matex:
Oliver Road, West Thurrock, Grays, Essex RM16 1EH.
Tel: **(0708) 863399**. *Telex*: **25207 TMATEX G**. *Fax*: **(0708) 866525**.

Wholly owned by Van Ommeren Ceteco. An excellent and modern installation on London's orbital motorway (M25), providing storage for a full range of petroleum products and a wide range of chemicals. Jetties can accommodate up to 50,000 tons dwt vessels. Comprehensive road loading facilities ensure rapid turnround times for loading vehicles. There are 348,000 cu. metres of storage in 120 tanks, a substantial number of which have floating decks. One hundred and five road loading points, many linked to on-line computer facilities. Rail facilities include handling capability for block trains and own shunting loc. Re-loading to barges and coasters at up to 500 tonnes per hour. Fully computerised stock accounting with direct links to customers equipment by arrangement. Plans exist for further expansion.

Tyne Terminal:
Northumberland Dock, North Shields, Tyne and Wear NE29 6DY.
Tel: **(091) 296 0999**. *Telex*: **53180 VELVA G**. *Fax*: **(091) 258 6996**.

Total capacity 52,000 cu. metres. Fifty mild steel tanks, ranging in capacity from 300 to 8,600 cu. metres for chemicals, gasolines and oils. Blending facilities. Many tanks are coiled. Ethanol bonded storage available. Some tanks are coated with epoxy or phenolic resin-based paints. Additional land is available for further development and construction to suit particular client requirements. Access by sea and road. Three berths at North Shields provide for vessels up to 10 metres draught. There is rapid access to major road networks for road tankers. Licences to handle chemical wastes. New tankage under construction.

SOGESTROL

Head Office: Route de la Chimie, 76700 Gonfreville l'Orcher, France.
Tel: **(3) 3553 3770**. *Telex*: **190582**. *Fax*: **(3) 3553 3694**.

Two terminals, with a total capacity of 320,000 cu. metres, located in the industrial area of **Le Havre Port**, near chemical and petrochemical plants, and reserved exclusively for chemicals and petrochemicals and all dangerous liquids. Tanks are insulated, coated, heated, refrigerated, of mild and stainless steel, with traced insulated lines. Nitrogen facilities into each tank. Tanks from 5,000 cu. metres have a floating roof. Access by road, rail, sea, river. Connections with certain local plants.

Terminal No.1: 147 tanks from 50 to 15,000 cu. metres, with a total capacity of 222,070 cu. metres. Three jetties, draught of 38ft. for 50,000 ton ships, length 250 metres. Reception from and delivery to ships, barges, road containers, rail cars and drums. Drumming and pipelines to local industries.

Terminal No.2: 38 tanks from 630 to 4,900 cu. metres, with a total capacity of 91,800 cu. metres. One jetty, draught of 27ft. for 9,000 ton ships. Reception from and delivery to ships, barges, road containers, rail cars and drums. Drumming station connected to tanks; facility to drum directly to road containers and rail cars.

New Extension: New building stainless steel tank from 390 to 740 cu.

metres, representing 10,000 new cu. metres. Plus a new jetty for 40,000 ton ships and a new building construction of 15,000 + 10,000 cu. metres in normal steel (terminal No 2).

SOTRASOL

36 rue de Liège, 75008 Paris, France.
Tel: **(45) 222270**. *Telex*: **280330**.
Tarnos (Port de Bayonne): 100,000 cu. metres capacity for chemical liquids, crude oil, liquid fertilisers, animal and vegetable oils and fats. Seventeen tanks from 640 to 15,000 cu. metres, some stainless steel, some with heating coils or insulation. Nitrogen blanketing facilities. Access by road, rail and sea (two jetties with draught up to 28ft).
Le Havre: One hundred tanks from 30 to 5,000 cu. metres, with a total capacity of 104,000 cu. metres for mineral oils, chemical products with a flash point of over 100°C, liquid fertilisers, molasses, natural and synthetic latex and vegetable and animal oils and fats. Tanks are partly stainless steel, some heated and insulated. Access is by road, rail and sea (three berths, maximum draught 38ft). Planned extension; 1,000 cu. metres.

SUNDERLAND TANK STORAGE LIMITED

Hendon Dock, Sunderland, Tyne & Wear, SR1 2ES, UK.
Tel: **(091) 565 4018.** *Telex*: **537371**.
Fax: **(091) 514 0628**.
The terminal can receive ships of up to 6,000 tons dwt capacity and has mild steel and stainless steel import lines. 36,000 cu. metres of storage are contained in twenty tanks. Products stored include petroleum refinery products, petrochemicals and chemical solvent byproducts. Nearby associated company has large distillation units for processing off specification and contaminated cargoes. Drumming off facilities, drum storage and bonded facilities also available.

TANKFREIGHT LTD

Copthall Bridge House, 1 East Parade, Harrogate HG1 5LN, UK.
Tel: **(0423) 506181**. *Telex*: **57608**.
Fax: **(0423) 522360**
Tank terminals at **Felixstowe** and on **Humberside** offer over 130,000 cu. metres bulk storage capacity equipped to handle a comprehensive range of liquid, edible, chemical and petroleum products.
Felixstowe Tankstore: FTD House, The Dock, Felixstowe, Suffolk IP11 8RY.
Tel: **(0394) 676112**. *Telex*: **98341**. *Fax*: **(0394) 673590**.
One hundred and seventy-nine tanks, mild and stainless steel, totalling 104,000 cu. metres storage capacity equipped to handle a comprehensive range of liquid, edible, chemical and petroleum products, alcohol, hydrocarbon and IDA bonded areas.
Humber Tankstore: Gunness Wharf, Scunthorpe, South Humberside DN15 8SY
Tel: **(0724) 783690**. *Fax*: **(0724) 782278**.
Fifty-five tanks, mild and stainless steel, totalling 32,000 cu. metres storage capacity equipped to handle a comprehensive range of liquid, edible, chemical and petroleum products, alcohol bonded area.

TEES STORAGE CO LTD

Erimus House, Queen's Square, Middlesbrough, Cleveland TS2 1QX, UK.
Tel: **(0642) 230000**. *Telex*: **58477**.
Fax: **(0642) 230107.**
Jointly owned by Gebr. Broere BV and Unitank Storage Co. Operates two terminals in the UK.
Middlesbrough: Fifty-six tanks from 50 to 6,500 cu. metres, with a total capacity of 80,000 cu. metres. Mild steel coated and stainless for petroleum and chemicals. Road, rail and sea. Jetty facilities at South Wharf for ships up to 7,500 tons dwt. Ten dock lines (six stainless steel). Based at the Middlesbrough terminal is a 1,500 tonne chemical tank-barge for inter-river transfers and overside cargo.
Seal Sands: Ninety tanks from 55 to 8,500 cu. metres, with a total capacity of 155,000 cu. metres. Mild steel coated and stainless for petroleum and chemicals. One sphere of 6,650 cu. metres for Vinyl Chloride Monomer. Road, sea and pipelines to neighbouring plants. Provision for rail. Drumming facilities. Three jetties for ships up to 40,000 tons dwt. Maximum length 760ft; maximum draught 36ft. Fourteen docklines (eight stainless).

TERMINALES PORTUARIAS, S.A.

Head Office: Port of Barcelona. Muelle de Inflamables. 08039 Barcelona. Spain.
Tel: **(3) 3350500**. *Fax*: **(3) 3358529**. *Telex*: **54061**.
Installations in the ports of **Barcelona, Tarragona, Bilbao** and **Valencia** for the storage of chemical and petrochemical products and vegetable oils. A joint venture between GATX Terminals Corporation and Petrofrance.
Barcelona Terminal: 49,530 cu. metres capacity in eighty-nine tanks ranging in size from 50 to 2,650 cu. metres. Two berths with 39ft (13 metres) draught. Services include drumming, liquid and dry goods storage (1,080 sq. metres of dry storage), bonded storage, heating, refrigeration, gas blanketing, and coated and stainless steel tanks. Surface access via Barcelona Expressway system. Rail side access to the Installation.
Bilbao Terminal: 7,450 cu. metres capacity in twenty-seven tanks ranging in size from 50 to 630 cu. metres. One berth with 22ft (6.7 metres) draught. Services include drumming, heated and coated tanks, gas blanketing. Surface access via E50 Coastal Highway.
Valencia Terminal: 20.815 cu. metres capacity in seventeen tanks ranging in size from 305 to 2.150 cu. metres. One berth with 36ft (12 metres) draught. Services include drumming and gas blanketing. Surface access via E101 Valencia-Madrid Highway and E26 Coastal Highway.
Tarragona Terminal: 28,280 cu. metres capacity in thirty tanks of 650 to 1,305 cu. metres. Two berths with 45ft (14 metres) draught. Services include heated, coated and stainless steel tanks, gas blanketing. Surface access via local major arteries. Rail side access to the Installation.

VAN OMMEREN CETECO NV

Head Office: Westerlaan 10, 3016 CK Rotterdam, Netherlands.
Tel: **(10) 464 9111**. *Telex*: **21435**.
The Van Ommeren Ceteco Group is the second largest independent tank storage company in the world with a capacity of over 10 million cu. metres, 6.2 million cu. metres of which is in Europe.
Through its 50 percent ownership

of Chemicals and Oil Storage Management Group, Van Ommeren is associated with Cumbrian Storage, Immingham Storage, Irish Bulk Liquids Storage and Velva Liquids. It also has UK interests through its wholly-owned subsidiary, Thames Matex (for details of these companies, see under Simon Storage Group Ltd.).

In the Netherlands, Belgium, France, Spain, Portugal, West Germany and Switzerland, there are six companies in the Van Ommeren Group, some wholly-owned and some associated companies: Bragtank AG, Gamatex NV, Dépôts Pétroliers de Fos, SA, Hansamatex Köhn & Kuyper (GmbH & Co) Jiber Tank SA, Quimatex LDA (details of these five companies can be found under their separate headings), and Matex Nederland BV, which manages Matex Amsterdam BV, Matex Europoort BV, Nieuwe Matex BV (details of these three companies can be found under their separate headings).

Outside Europe the Van Ommeren Group has associated terminals in the USA, Canada, Korea, Bangladesh, Pakistan, Singapore and Mexico.

Van Ommeren's storage facilities are complemented by the group's inland tank shipping services which operate in The Netherlands, Switzerland, West Germany and Belgium.

VTG-PAKTANK TANKLAGER GMBH & CO. KG

Brandsende 2–4 2000 Hamburg 1, West Germany.

Tel: **(40) 322843**. *Telex*: **2163506**. *Fax*: **(40) 322630**.

Hohe Schaar (Hamburg): 427,000 cu. metres; sea, road, rail; 48ft; crude oils, petroleum products, chemicals.

Tollerort (Hamburg): 32,000 cu. metres; sea, road, rail; 29ft; petroleum products, chemicals, lubricating oils, latex, vegetable and animal oils and fats.

Kiel: 8,000 cu. metres; sea, road; 30ft; petroleum products.

VTG VEREINIGTE TANKLAGER UND TRANSPORTMITTEL GMBH

Head Office: Neue Rabenstrasse 21, 2000 Hamburg 36, West Germany.

Tel: **(40) 441910**. *Telex*: **2170080 vt d**.

VTG, a member of the PREUSSAG Group, is one of the largest independent tank storage companies in Europe. VTG operates large modern tank installations at seaports and inland with a total capacity of around 2.5m cu. metres. Storage facilities are complemented by 22,500 rail tank wagons, special purpose wagons and tank containers for the transport of petroleum products, chemicals, gases and bulk goods. An inland tank shipping service operates on all major European waterways.

Berlin: 225,000 cu. metres, 85 tanks ranging from 10 to 20,000 cu. metres for all petroleum products, solvents and petrochemicals; access for barges, road and rail tank cars and liner trains.

Duisburg: 255,000 cu. metres, 140 tanks varying in size from 15 to 9,000 cu. metres. Insulated, coiled, coated and aluminium tanks are available and equipped with dedicated pipelines, heating, blending, nitrogen blanketing, vapour-return and dry air ventilation facilities. Petroleum products, chemical and petrochemical liquids, liquefied gases and solvents. Distribution by road, rail, barge, pipeline.

Ebrach: 5,000 cu. metres for storing petroleum products.

Hanover: 314,000 cu. metres. 28 tanks ranging from 500 to 70,000 cu. metres for crude oil, petroleum products, chemicals and solvents. Access for road and rail tank cars, liner trains and barges; crude oil pipeline.

Munich: 155,000 cu. metres, 49 tanks ranging from 50 to 47,000 cu. metres for storing petroleum products, chemical and petrochemical liquids and solvents. Blending facilities for gasoline are available. Access as above.

Regensburg: 77,000 cu. metres, 60 tanks varying in size from 100 to 9,000 cu. metres. All petroleum products, chemical and petrochemical liquids and solvents. Heating, blending and mixing facilities. Distribution by road, rail and barge.

Operation of the BP terminals:

Köln: 101,000 cu. metres, 31 tanks ranging from 25 to 25,000 cu. metres for storing petroleum products, chemicals and solvents. Access by road, rail, barge and pipeline (RMR).

Mainz-Gustavsburg: 256,000 cu. metres, 33 tanks ranging from eight to 40,000 cu. metres for all petroleum products, solvents and petrochemicals. Access by barge, road, rail tank cars, liner trains and pipeline (RMR).

Amsterdam: Comos Tank BV

Dusseldorf: Omin-Tank GmbH

Hamburg: VTG-Paktank Hamburg GmbH

Further details of these three companies are given under their separate headings.

Storage market on the move

Jan Brouwer, President of Paktank International BV, claims the re-unified Germany will create an overall upsurge in oil demand in that country.

He estimates East German demand will almost double from the present 16 million tons a year to 27–30 million tons by the year 2000 and more than 60 percent of the increase will have to be found from European markets.

'The West Germans, who cannot satisfy their own domestic demand of some 110 million tons a year in 1990 due to lack of refining capacity, already need to import 34 million tons a year, while the East German refining industry will not be able to satisfy the expected surge in demand,' he said.

Even the forecast decline in West German consumption of some 6 million tons per annum by the year 2000 will not be sufficient to make up for the energy needs of the 'new Germans'.

'It is forecast that the import needs of the reunified Germany will range between 35 to 40 million tons by the turn of the century; some 50 percent of that demand will pass Emmerich and to a large extent be channelled via Rotterdam,' he predicted.

Interestingly, Mr Brouwer claims customers using storage in Rotterdam and North West Europe are changing: 'In general producers are entering the market, denoting a shift from the FOB source refinery to the FOB market, and all are going global.'

He told the *Petroleum Review* that for the first three decades since World War II the principal customers for storage capacity were the majors. Then there was a shift towards trading companies and now governments and producers are becoming increasingly important.

The only consequence of this shift was a change in customer, no additional consumption had been created because the market growth in Europe is very limited. However, he said: 'In many markets the producers are replacing those parties which are active today and so will become an integral part of the market sooner or later.'

Mr Brouwer welcomed this shift, especially in terms of the facilities his company could offer the new market players: 'This move by producers is rewarding in many aspects. They will receive the final market price for their products and, what's more, learn how the market segments operate globally.'

Moreover he believed that Paktank could play a part in this process: 'My company supplies flexible storage contracts, flexible in time, quality and related services, which will enable our customers to float with the market waves.'

Most of the producers now entering the market for the first time were following the example of the Kuwaitis.

'In principle the producer is offering the full range of petroleum products, but in the mix there are substantial differences between them. What they have in common is a step-by-step approach to get control from wellhead to gas tank. The producers, especially the OPEC members, see the Kuwaiti approach as a kind of guideline,' he said.

Independent storage industry's views on hydrocarbon recovery

By Geoffrey Mayhew

The independent bulk storage industry in the United Kingdom is now deep into the consideration of all aspects of a major development in the handling of volatile liquids. It is accepted in the industry that the cost of installing the required equipment will be vast. The change will be designed to reduce significantly the venting to atmosphere of hydrocarbon compounds when gasoline is moved to and from storage.

This follows concern about the effects of hydrocarbon, or, more correctly, volatile organic compound (VOC) emissions. These occur to about the same extent from natural as well as man-made emissions. The major sources of the latter are from solvents and gasoline.

The amount of vapour emissions from gasoline storage is small. It is estimated by Concawe, the oil companies' European organisation for environmental and health protection, that of the total man-made VOC emissions, 3 percent derive from gasoline distribution of which about one-third is attributable to storage.

Control measures

Nevertheless, an EC directive for the control and reduction of gasoline vapours in storage is coming.

A situation which complicates the technicalities of gasoline vapour recovery in the independent bulk storage industry is the use of individual tanks for the storage of different products, the vapour content of which differs. This method of storage is an essential in their trade — dedicated tanks are rare.

On the other hand, in oil companies it is usual to have dedicated storage tanks for gasoline at the end of the manufacturing process.

The problems caused by emissions of VOCs and the government's policy on controlling them was outlined recently by the Department of the Environment.

Combined with oxides of nitrogen (NOx) in sunlight, VOCs form photochemical oxidants such as ozone. Low-level ozone is harmful to the growth of some plants and could cause respiratory problems for humans.

This tropospheric ozone is separate from stratospheric ozone, which is being depleted by CFCs and halons.

The government considered it important to reduce emissions of VOCs and, internationally, control measures were discussed. The aim was to tackle photochemical oxidant creation, but sight would not be lost of local environmental pollution and the hazardous nature of some VOCs. UK representatives proposed measures aimed at concentrating reductions on those VOCs which had the greatest potential to create photochemical oxidants.

A protocol to the Long-Range Transboundary Air Pollution Convention, with control measures for stationary and mobile sources, was likely to be ready for signature in late 1991.

In the preliminary indications of the EC directive, the outline of a time-table covering eight years for the implementation of the measures was given, but without a start date. It is possible that the time-table may lengthen, or the start be a little delayed, due to the complexities of the situation.

The Independent Tank Storage Association and member companies consider that a balanced approach to the subject is essential. But they agree that this need not delay the technical measures being put into effect once a start date is decided. They expect that by the end of the decade independent bulk storage terminals will be equipped with emission control systems to limit VOCs escaping to the atmosphere.

The independent bulk storage industry also feels there is a need for a clearer definition of the environmental problems of VOCs in order to devise efficient methods of dealing with them.

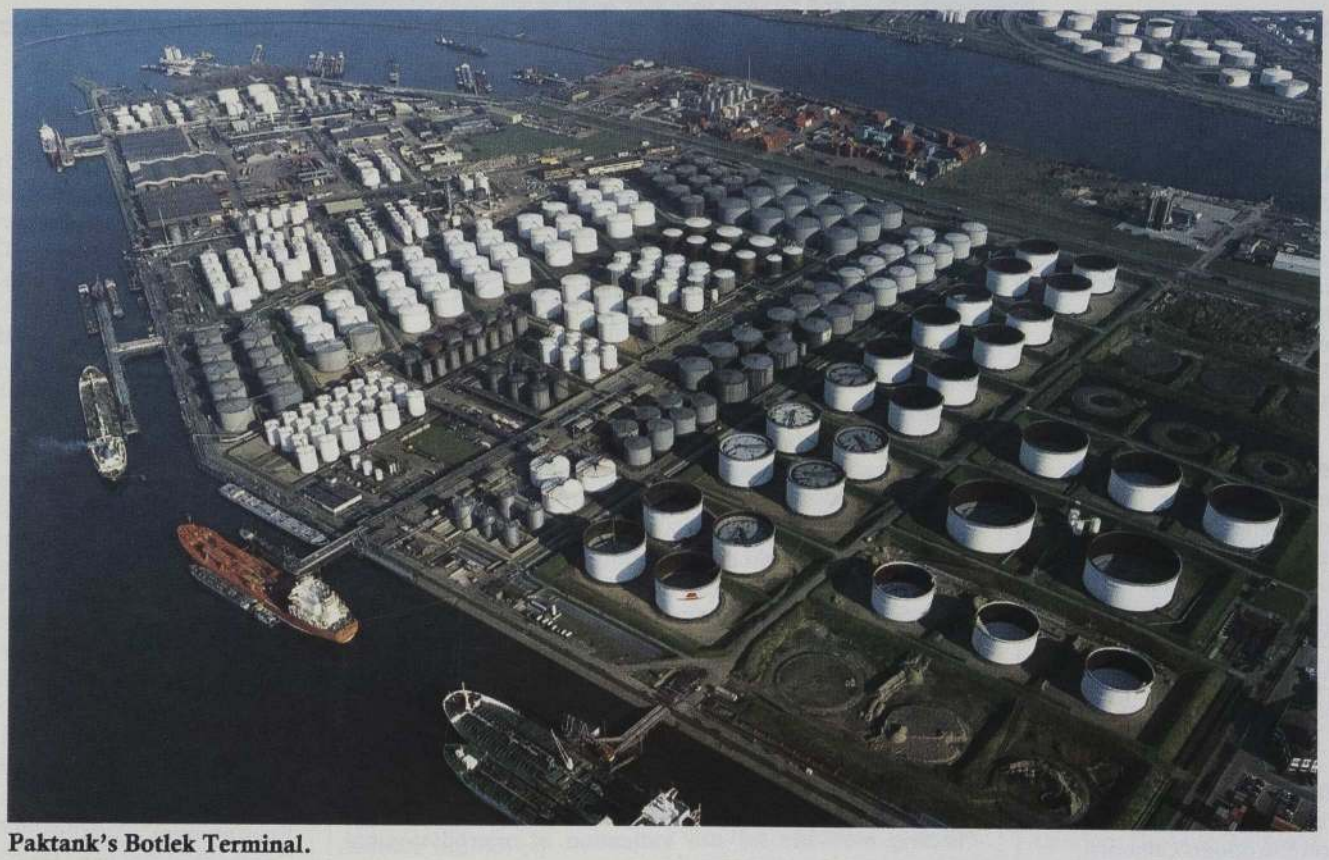
More scientific information on the environmental dangers would be helpful, they say, and ideally this would be in terms intelligible to the non-scientist.

A challenge in itself will be the method of payment for these environmental protective measures. A transparently equitable form of charging has to be established, say storage companies.

European measures

In Holland the storage trade organisation recently introduced environmental charges per tonne of stored product. This money goes towards the cost of installing protective technology. This has come about for a wider number of reasons than vapour recovery itself and follows an agreement with the Dutch government. It is in advance of firm information on the eventual requirements of the EC for vapour recovery in relation to the independent bulk storage industry.

However, the UK storage industry takes the view that the Dutch system would not be acceptable to the bulk storage clients in this country, and understands that the Dutch association may be challenged on their system. Nevertheless, the British industry does believe that a separate environmental cost will have to be passed to the customer.



Paktank's Botlek Terminal.

Who pays?

'As a large hydrocarbons storage company, our concern is that the changing requirements should be carried out in good order, internationally organised, and in combination, so that the best quality in environmental technology is achieved,' said Richard Kellaway, Managing Director, GATX Terminals Ltd, Maidenhead.

'This will be the number one issue in our business over the next 10 years. We are happy, of course, to do what the law will require and we appreciate the environmental concern, but the development will have to be paid for by increased storage rates, or through some other form of environmental surcharge. We support the British government approach, which is that all factors should be taken into account.'

Mr H H Cail, Executive Secretary, ITSA, was pleased that the Institute of Petroleum was to be represented on the technical committee of the Department of Transport which is studying the question.

'There are many environmental questions on which few are fully informed, and the more definitive information that can be provided the better will be the final guidance,' he said. 'The question of the effect of ozone in the lower atmosphere is one of these. Another relates to the disposal of vapour after it has been recovered. If it is to be destroyed by burning, will you not be liberating CO_2 to the atmosphere, another problem?

'The most efficient way to prevent atmospheric pollution is to return the vapour to the tank from which the product has been removed. Unfortunately, the sizing of vapour return lines depends on a complicated range of factors, such as the distance from the tank to the vessel, the density of the liquid, construction parameters, and so on.

'So vapour return lines must be designed on a tank by tank basis. But the flexible use of tankage is essential to the viability of our industry. Dedicated tanks and lines are only installed for particular long-term contracts.

'Vapour return or "balancing" is not really an option for our industry if potential hazards to the ship and shore installations are not to be substantially increased.'

Recovery and disposal

Various aspects of vapour recovery and disposal technology for the loading and venting of volatile organic compounds have been studied by the US Environmental Protection Agency, the United Nations, the EC, the International Maritime Organisation (IMO), the US Coast Guard (USCG) and individual companies and organisations.

During the past two years the USCG have drawn up standards which ship and shore terminals should follow in certain cases. This was followed by the IMO establishing a joint working group to look again at the problems posed by legislation on vapour emission control during ship to shore transfer of volatile products.

The Department of Transport has asked its Bulk Dangerous Goods Committee to prepare the UK view for IMO. As gasoline is a major source of the vapours arising from bulk liquids, ITSA proposed that the Institute of Petroleum be invited to join this body to make available its expertise in this field.

When the EC directive takes effect, it is expected that in the first phase, lasting three years, vapour emission controls would be mandated on storage tanks and during loading into trucks and rail cars at facilities with a gasoline throughput greater than 50,000 tonnes a year.

The first phase would begin one year after the directive is approved by the EC Council of Ministers. It is likely that bottom loading would be required for trucks by the end of that first phase.

During the second phase, lasting four years, all terminals loading more than 25,000 tonnes a year into trucks, rail cars and marine vessels would have to install vapour recovery units. ■

FORTHCOMING EVENTS

August

13th–17th
Oxford: Seminar on 'Natural Gas: The Commercial Challenges'. Details: The Alphatania Programme, 19 Barlby Road, London W10 6AN. Tel: (071) 969 1982. Fax: (071) 960 8850.

15th-17th
Tromso, Norway: Conference on 'Arctic Geology and Petroleum Potential'. Details: Norwegian Petroleum Society, PO Box 1897, Vika, 0124 Oslo 1, Norway. Tel: (47) 220 7025. Fax: (47) 283 3130.

20th-22nd
Trondheim, Norway: 'The First European Offshore Mechanics Symposium'. Details: EUROMS '90 Secretariat, Department of Continuing Education, The Norwegian Institute of Technology, N-7034 Trondheim, Norway. Tel: (47) 7595254. Fax: (47) 7517226.

27th-31st
Edinburgh: Course on 'Well Design and Completion Technology'. Details: Director of Continuing Professional Education, Heriot-Watt University, Edinburgh EH14 4AS. Tel: (031) 449 5111.

27th-29th
New Orleans: 'Fourth International Symposium and Exposition on Gas Turbines in Cogeneration, Repowering and Peak-Load Power Generation'. Details: International Gas Turbine Institute, 6085 Barfield Road Suite 207, Atlanta, GA 30328 USA. Tel: (404) 847 0072. Fax: (404) 847 0151.

28th-29th
Stavanger, Norway: 'Ninth Offshore Northern Seas Conference'. Details: Bente Baerheim, Conference Manager, ONS Conference, PO Box 175, N-4001 Stavanger, Norway. Tel: (47) 4558100. Fax: (47) 4551015.

28th-30th
London: Conference on 'World Aerospace and Air Transport'. Details: Financial Times Conference Organisation, 126 Jermyn Street, London SW1 4UJ. Tel: (071) 925 2323. Fax: (071) 925 2125.

September

3rd–4th
London: Conference on 'Oil Recovery Hose and Seals: Problems and Solutions'. Details: Kay Royle, Rapra Technology Limited, Shawbury, Shrewsbury, Shropshire SY4 4NR. Tel: (0939) 250383. Fax: (0939) 251118.

3rd-7th
London: Course on 'Advance Reservoir Geology: A North Sea Perspective'. Details: JAPEC Secretary, c/o The Geological Society, Burlington House, Piccadilly, London W1V 0JU. Tel: (071) 434 9944. Fax: (071) 439 8975.

3rd-7th
Edinburgh: Course on 'Principles of Reservoir Engineering'. Details: Director of Continuing Professional Education, Heriot-Watt University, Edinburgh EH14 4AS. Tel: (031) 449 5111.

3rd-14th
Lausanne: '22nd International Petroleum Executive Seminar'. Details: Dr Bob Gale, Petroleum Economics Limited, 17/19 Barter Street, London WC1A 2AQ. Tel: (071) 404 0221. Fax: (071) 405 7429.

6th
London: Conference on 'Warnings of Preventable Disasters'. Details: The Fellowship of Engineering, 2 Little Smith Street, Westminster, London SW1P 3DL. Tel: (071) 222 2688. Fax: (071) 233 0054.

10th-12th
Edinburgh: Course on 'Statistical Analysis of Reservoir Data'. Details: Director of Continuing Professional Education, Heriot-Watt University, Edinburgh EH14 4AS. Tel: (031) 449 5111.

10th-14th
Netherlands: Course on 'Fuels Utilisation and Environment'. Details: Conference Section, Institution of Chemical Engineers, Davis Building, 165-171 Railway Terrace, Rugby CV21 3HQ. Tel: (0788) 78214. Fax: (0788) 60833.

12th
London: 'Second North Sea Safety Conference'. Details: Dr Robert Owen, Technology Forum, Stanley House, Stanley Avenue, Wembley, Middlesex HA0 4JB. Tel: (081) 900 1555. Fax: (081) 900 1134.

12th-14th
Oxford: Course on 'Marketing Petroleum Fuels to Industry and Commerce'. Details: The Registrar, The College of Petroleum Studies, Sun Alliance House, New Inn Hall Street, Oxford OX1 2QD. Tel: (0865) 250521. Fax: (0865) 791474.

17th-19th
Leeds: Course on 'Incineration and Energy from Waste'. Details: Mrs C. Shirley, Senior Administrative Assistant, Department of Continued Professional Education, The University of Leeds, Leeds LS2 9JT. Tel: (0532) 431751. Fax (0532) 336017.

Call for Papers

The Hungarian Hydrocarbon Institute Section of the Hungarian Chemical Society are holding a conference on 'Microbiology in the Oil Industry and Lubrication' between 10 and 14 September 1991.

In the course of discussion sessions the conference will deal with microbiological problems encountered in the oil industry and especially in lubrication engineering, their theoretical and practical aspects, assortment of biocide additives and their application possibilities, test methods for possible causes of infection and environmental protection problems.

Papers are invited on the following subjects:
- **source sediments, soils**
- **microbiological phenomena in petroleum production**
- **microbiological problems encountered in transportation, storage and processing of crude oil and petroleum products**
- **importance of microbiology in lubrication engineering**
- **chemistry, theory and acting mechanism of biocide additives**
- **practical application of biocide additives**
- **testing methods for the indication of microbiological infection**
- **practical experiences in lubrication**
- **microbiology in connection to the environmental problems emerging in the oil industry**
- **microbial degradation of asphalts.**

Summaries of proposed papers should be sent by 30 November 1990 to: A Zakar, Chairman of the Organising Committee, Hungarian Chemical Society, H-1061 Budapest, Anker koz 1, Hungary. Tel: 36 11 427 343.

FORTHCOMING EVENTS

17th-19th
Singapore: 'The 6th Asia-Pacific Petroleum Conference'. Details: Times Conferences Pte Ltd, Times Centre, 1 New Industrial Road, Singapore 1953. Tel: (65) 3807427. Fax: (65) 28657454.

19th
London: Conference on 'The Costs of Flue Gas Desulphurisation'. Details: Judith Higgins, The Institute of Energy, 18 Devonshire Street, London W1N 2AU. Tel: (071) 580 0008. Fax: (071) 580 4420.

19th-20th
London: Seminar on 'Soviet Energy in the new Europe'. Details: Administration SAEE/BIEE, Conference Office, Mary Scanlon, 37 Woodville Gardens, London W5 2LL.

23rd-25th
Calgary, Canada: Conference on 'Oil and Gas Markets'. Details: Conference Division, Canadian Energy Research Institute, 3512-33 Street NW, Calgary, Alberta, Canada T2L 2A6. Tel: (403) 282 1231. Fax: (403) 284 4181.

24th-25th
Oslo, Norway: Conference on 'The European Energy Market after the East European Political Revolution'. Details: Norwegian Petroleum Society, PO Box 95, N-5049 Sandsli, Norway. Tel: (47) 5224885. Fax: (47) 5228970.

24th-28th
Halifax, Nova Scotia: '11th International Marine Tug Convention & Salvage Symposium Exhibition.' Details: Offshore Conferences & Exhibitions Ltd, Rowe House, 55-59 Fife Road, Kingston upon Thames, Surrey KT1 1TA. Tel: (081) 549 5831. Fax: (081) 541 5657.

24th-28th
Leeds: Course on 'Fire and Explosion'. Details: Mrs C. Shirley, Senior Administrative Assistant, Department of Continued Professional Education, The University of Leeds, Leeds LS2 9JT. Tel: (0532) 431751. Fax: (0532) 336017.

25th-26th
London: Conference on 'Independent Power Generation'. Details: Derek Downing, Inpower '90 Conference Organiser, Queensway House, 2 Queensway, Redhill, Surrey RH1 1QS. Tel: (0737) 768611. Fax: (0737) 761685.

25th-27th
London: Course on 'Pressures and Hydrogeology in Petroleum Basins'. Details: JAPEC Secretary, c/o The Geological Society, Burlington House, Piccadilly, London W1V 0JU. Tel: (071) 434 9944. Fax: (071) 439 8975.

25th-29th
Hamburg: International Shipping and Marine Technology Market. Details: Hamburg Messe und Congress GmbH, Jungiusstrasse 13-Messehaus, D-2000 Hamburg 36. Tel: (35) 69-0. Fax: (35) 692180.

26th-28th
London: 'Oil Industry Nurses Symposium'. Details: Caroline Little, The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR. Tel: (071) 636 1004. Fax: (071) 255 1472.

26th-28th
Glasgow: '7th Offshore Information Conference'. Details: Arnold Myers, Information Officer, Institute of Offshore Engineering, Heriot-Watt University, Edinburgh EH14 4AS. Tel: (031) 449 3393. Fax: (031) 449 6254.

29th September-2nd October
London: Conference on 'The Way Ahead – Hydrocarbons for the 1990s'. Details: American Association of Petroleum Geologists, 1991 AAPG International Conference, PO Box 979, Tulsa, OK 74101-0979, USA.

October

1st–3rd
Long Beach, California: Course on 'Competitive Crude Oil Marketing in the United States'. Details: Jane Davys, The College of Petroleum Studies, Sun Alliance House, New Inn Hall Street, Oxford OX1 2QD. Tel: (0865) 250521. Fax: (0865) 791474.

1st-3rd
Munich, FR Germany: 'Applications and Efficiency of Heat Pump Systems in Environmentally Sensitive Times'. Details: Conference Organiser, Heat Pumps, BHR Group Limited, Cranfield, Bedford MK43 0AJ. Tel: (0234) 750422. Fax: (0234) 750074.

2nd-3rd
Birmingham: Conference on 'Pollution Management.' Details: Financial Times Conference Organisation, Pollution Management, 126 Jermyn Street, London SW1Y 4UJ. Tel: (071) 925 2323. Fax: (071) 925 2125.

2nd-4th
Birmingham: Course on 'Understanding Heat Treatment'. Course Administrator, Wolfson Heat Treatment Centre, Aston University, Aston Triangle, Birmingham B4 7ET. Tel: (021) 359 3611. Fax: (021) 359 6470.

2nd-4th
Birmingham: Exhibition and Conference 'Environmental Technology '90'. Details: Caroline Hurley, The Financial Times Conference Organisation, 126 Jermyn Street, London SW1Y 4UJ. Tel: (071) 925 2323. Fax: (071) 925 2125.

3rd
London: Conference on 'How do we know R&D is good value for money?' Details: Elaine Wellingham, Conference Secretariat, Field End House, Bude Close, Nailsea, Bristol BS19 2EQ. Tel: (0272) 853311.

3rd
London: Half-day seminar on 'Training of Mechanical Engineers for the Offshore Oil and Gas Industry'. Details: Mr C. Corbett, Institution of Mechanical Engineers, 1 Birdcage Walk, London SW1H 9JJ. Tel: (071) 222 7899.

3rd
London: Conference on 'Subsea Isolation Systems – design and installation an update'. Details: The Editor, SEN, PO Box 213, Swindon SN6 8UA. Tel: (079371) 303. Fax: (079371) 433.

6th-12th
New Delhi: 'ChemTech '90'. Details: ChemTech Secretariat, Taj Building, 3rd Floor, 210 Dr D N Road, Bombay 400 001, India. Tel: 2042044.

7th-19th
Oxford: Course on 'Management of Shipping Costs and Revenues with Computer Applications'. Details: Mrs Jeanette Soper, Drewry Shipping Consultants Limited, 11 Heron Quay, London E14 9YP. Tel: (071) 538 0191. Fax: (071) 987 9396.

FORTHCOMING EVENTS

9th
London: Conference on 'Information Support for the Energy Industries – An Evaluative Approach'. Details: Caroline Little, The Institute of Petroleum.

9th-10th
Sheffield: Course on 'The Update of the COSHH Regulations'. Details: Mrs KW Wainwright, The Centre for Continuing Vocational Education, The University of Sheffield, 65 Wilkinson Street, Sheffield S10 2GJ. Tel: (0742) 768653.

9th-10th
London: Conference 'Hydrocarbons 90'. Details: Hydrocarbons 90 International Conference, Themedia Ltd, PO Box 2, Chipping Norton OX7 5QX. Tel: (060884) 700/888. Fax: (060884) 796.

16th-17th
London: Course on 'Oil and Loss Control'. Details: Amanda Stuart, IBC Technical Services Ltd, Bath House, 56 Holborn Viaduct, London EC1A 2EX. Tel: (071) 236 4080. Fax: (071) 489 0849.

17th
Guildford: Conference on 'Energy Demand: Evidence and Expectations'. Details: Mrs E. Blakeway, Department of Economics, University of Surrey, Guildford, Surrey GU2 5XH. Tel: (0483) 509171. Fax: (0483) 300803.

18th
London: Conference on 'Oil Mists'. Details: Caroline Little, The Institute of Petroleum.

28th-2nd November
Moreton-in-Marsh: Course on 'Handling Emergencies in the Oil Industry'. Details: Mr RJ Barnard, Petroleum Training Federation, Room 326, 162-168 Regent Street, London W1R 5TB. Tel: (071) 439 2632. Fax: (071) 287 5483.

29th
London: Conference on 'Emergency Planning'. Details: Liz Hide IBC Technical Services Ltd, Bath House (3rd Floor), 56 Holborn Viaduct, London EC1A 2EX. Tel: (071) 236 4080. Fax: (071) 489 0849.

31st
London: Conference on 'Electricity from Gas'. Details: Judith Higgins, The Institute of Energy, 18 Devonshire Street, London W1N 2AU. Tel: (071) 580 0008. Fax: (071) 580 4420.

November

6th
London: Conference on 'Safe Road Transport in the Petroleum Industry – The Way Ahead'. Details: Caroline Little, The Institute of Petroleum.

7th-14th
Alfriston: 'Environmental Policy and Management: an international forum'. Details: Courses Department, The British Council, 65 Davies Street, London W1Y 2AA. Tel: (071) 389 7817.

8th
London: Conference on 'Environmentally Induced Weld Failures'. Details: The Meetings Department, The Welding Institute, Abington Hall, Abington, Cambridge CB1 6AL. Tel: (0223) 891162. Fax: (0223) 892588.

13th-14th
Geneva: Conference on 'The Automotive Industry and the Environment'. Details: Helen Conry, Environmental Matters, 43 Manchester Street, London W1M 5PE. Tel: (071) 224 1876. Fax: (071) 224 4961.

14th-15th
Amsterdam: Conference on 'World Shipping'. Details: The Financial Times Conference Organisation, 126 Jermyn Street, London SW1W 4UJ. Tel: (071) 925 2323. Fax: (071) 925 2125.

16th
London: Conference on 'Futures and Forward Markets – Swaps and Options – Which Way Forward?'. Details: Caroline Little, The Institute of Petroleum.

19th–20th
Egham: Course on 'Modern Developments in Airport Fuelling Operations'. Details: Dr EM Goodger, Route SouthWest Ltd, 78 Church Road, Woburn Sands, Milton Keynes, MK17 8TA. Tel: (0908) 582120. Fax: (0784) 435383.

22nd
London: Conference on 'Offshore Safety – The Way Ahead'. Details: Caroline Little, The Institute of Petroleum.

22nd-24th
Perth, Australia: 'Petroleum Technology Australia 90'. Details: Energy House, 103 Scarborough Beach Road, Mt Hawthorn, Western Australia 60616. Tel: (09) 443 3400. Fax: (09) 242 1811.

25th-28th
Singapore: 'The Far East Maritime and Offshore Services Show'. Details: Hilal Asian Exhibitions, 50 Jalan Sultan, 20-06 Jalan Sultan Centre, Singapore 0512. Tel: 2939233. Fax: 2970862.

26th-28th
London: Conference on 'Welded Structures '90'. Details: The Meetings Department, The Welding Institute, Abington Hall, Abington, Cambridge CB1 6AL. Tel: (0223) 891162. Fax: (0223) 892588.

27th-29th
Birmingham: Course on 'Understanding Heat Treatment'. Course Administrator, Wolfson Heat Treatment Centre, Aston University, Aston Triangle, Birmingham B4 7ET. Tel: (021) 359 3611. Fax: (021) 359 6470.

December

4th
London: Workshop on 'Crude and Petroleum Product Shipments: Problems encountered during independent inspection'. Details: Caroline Little, The Institute of Petroleum.

9th-14th
Moreton-in-Marsh: Course on 'Handling Emergencies in the Oil Industry'. Details: Mr RJ Barnard, Petroleum Training Federation, Room 326, 162–168 Regent Street, London W1R 5TB. Tel: (071) 439 2632. Fax (071) 287 5483.

14th
London: Seminar on 'Elastomeric Seals for Oilfield Applications'. Details: Sian Turner, PR1, The Plastics and Rubber Institute, 11 Hobart Place, London SW1W 0HL. Tel: (071) 245 9555. Fax: (071) 823 1379.

German unification: the European energy and petrochemical dimension

By Chris Peacock, Principal, Chem Systems

The purpose of this paper is to set the energy and petrochemical aspects of German unification in their broader European context. A clear theme is the test which this will present to the evolving influence of the European Community (EC) as a supra-national institution, in the crucial areas of industrial competition, business structure and the environment.

With a crash programme to transform the semi-fossilised economy of East Germany, some fundamental issues have been raised, which were already the topic of strong debate within the EC. Competition, as a cornerstone in the proper operation of a free market, is one of the principles embedded in the Treaty of Rome. But for the gas and electricity industries, monopolistic domination has only recently been challenged by the EC. The question now arises: should the state monopolies of East Germany be replaced by private monopolies? There is of course a special UK perspective on this question, since British Gas was privatised as a de facto monopoly and efforts are now being made to introduce competition into electricity supply.

Predictably, the EC Commission in Brussels has been drawn into the question of the future organisation of the gas and electricity businesses in a united Germany. But there is a major dilemma in the need for urgent action, particularly in the electricity sector, and decisions may be based more on expediency than on long-term policy considerations.

In contrast to the gas and electricity sectors, the oil and petrochemical businesses in the EC have had a tendency to fragmentation. A key issue is the ability of the East German enterprises to survive competition. Environmental questions are also high on the agenda for the European energy and petrochemical industries — enormous publicity has been given to the problems on this front in the East European countries.

New political geography

As the political map of Europe is redrawn, some clarification of definitions is needed. East Germany is now assumed to be on an irrevocable path towards incorporation in a united Germany, and hence to become a part of the European Community. The EC is set to grow physically even further as other countries apply to join, including Austria and Czechoslovakia. Moreover, it will grow further in importance as it undergoes the 'deepening' implied by the Single European Act and the forthcoming intergovernmental conferences on monetary and political union.

So long as the iron curtain was in place, we could refer to Western Europe, with care only to say whether Iceland, Yugoslavia and Turkey were included. My company took Western Europe to equal the 12 EC countries plus the five main Efta countries, ie excluding Iceland. Although the concept of Western Europe is itself becoming outdated, the old definition is retained here. The definition of Eastern Europe always was more problematical — was the USSR included or not? Countries such as Hungary seem to prefer the term 'Central Europe'. In this paper, we have excluded the USSR from our definition of 'Europe' and have divided the East-Central countries into two geographical groups:

North East Europe: Poland, Czechoslovakia and Hungary

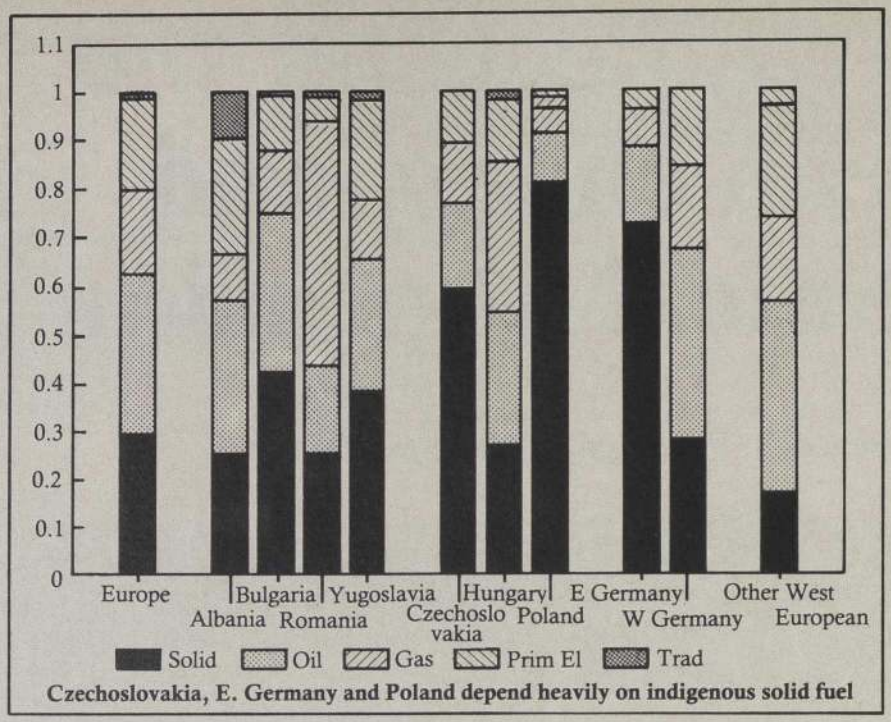
South East Europe: Yugoslavia, Romania, Albania and Bulgaria

For simplicity, we refer to these two groups plus East Germany together as 'Eastern Europe'.

Basic facts

As a demand base, Europe has a population close to 500 million people, approaching the total for the United States and the Soviet Union added together of 540 million. Eastern Europe represents 28 percent of the population but as GNP per capita is less than half the western level, the grouping only accounts for 13 percent of total European GNP.

Despite the discrepancy of living standards, Eastern Europe has a per capita energy consumption similar to that for Western Europe, with the East Germans in fact well ahead of their Western countrymen on this consumption indicator. This is perhaps a prime example of the wastefulness of the so-called command economy. However,



Czechoslovakia, E. Germany and Poland depend heavily on indigenous solid fuel

Figure 1: Fuel use patterns

as shown by **Figure 1,** a large proportion of the primary energy in East Germany and the other North-East European countries is solid fuel — lignite or hard coal.

East European oil consumption per capita, perhaps better correlated with real prosperity than total energy, is only 0.7 ton per year, half the West European level. Thus, the combined European oil demand, at about 620 million tons, is 18 percent more than that of Western Europe alone.

For the refinery business, a critical parameter is the proportion of heavy fuel oil (HFO) in the total oil product demand, and hence the need for residue upgrading plant. The variation of this parameter in Europe is summarised in **Table 1**.

For reference, a simple hydroskimmer refinery, which has no residue upgrading, typically yields 37 percent HFO on North Sea crude, and 43 percent on Arabian Light, so that substantial residue upgrading capacity is employed to match the West European demand pattern with 20 percent HFO. In Eastern Europe, mostly Russian crude is processed, which is generally slightly heavier than Arabian Light, but the higher share of HFO in the demand slate means that the need for residue upgrading is less. The general pattern is that in each country one large refinery has upgrading capacity, to balance the output from other smaller and simpler refineries. As can be seen from the table, both parts of Germany have relatively low HFO use levels. Another point to note is the relatively small impact on the HFO proportion — a 1 percent increase — of adding East to West, a rule which applies to the two parts of Germany and of Europe as a whole.

This very brief snapshot helps to put the East European refining business into context but there is clearly a need for an in-depth analysis of the oil industry infrastructure, as the East

	East	*West*	*Total*
	%	*%*	*%*
Germany	21	10	11
Rest of Europe	29	22	23
Total	28	20	21

Table 1: Heavy fuel oil as percentage of European oil product demand

million metric tons per annum			
	East	*West*	*Total*
Germany	0.5	3.1	3.6
Rest of Europe	2.6	12.1	14.7
Total	3.1	15.2	18.3

Sources: *East European Petrochemicals* and *Petroleum and Petrochemical Economics*, Chem Systems, 1989/90.

Table 2: European ethylene plant capacities

European refineries consider how to re-orient their operations towards being internationally competitive.

Petrochemicals

Each East European country (except Albania) has at least one reasonably large-scale steam cracker to produce olefins, based on Western technology. Ethylene capacities are summarised in **Table 2.**

East European ethylene capacity is thus 17 percent of the total, a similar level to that seen in the oil business. However, it should be noted that there are a number of acetylene plants in East Europe, which have boosted the total capability to produce petrochemicals. The international competitiveness of these is doubtful, particularly the carbide process units operated by Chemische Werke Buna at Schkopau in East Germany.

EC energy and environmental policies

The '1992' single market policy is the most well-known outcome of The Single European Act. Another very significant element is the formal statement, in Article 100R, that 'Environmental protection shall be a component of the Community's other policies.'

ENERGY	ENVIRONMENT
● Single Energy Market – Price transparency – Gas and electricity transit – Investment notification – Further steps to open competition?	● Large Combustion Plant Directive
● Action against Subsidies – West German coal	● Fourth Environmental Action Plan 1987–1992
● Energy Policy Objectives	● Vehicle Emission and Fuel Quality Standards

Global warming concern is a major new factor

Table 3: EC Energy and environmental policies

- Improve efficiency by at least 20 percent
- Maintain oil imports below one-third of total consumption
- Increase the share of solid fuels in energy consumption
- Achieve more secure conditions of supply
- Apply common price formation principles
- Achieve greater integration of the internal energy market
- Seek balanced solutions between energy and the environment
- Promote technological innovation

These objectives were adopted in 1986 and updating is clearly needed

Table 4: EC Energy policy objectives for 1995

- World's largest lignite producer – 320 million tons/year
- Crude oil supplied by pipeline from USSR
- Power generation mostly lignite-based, some nuclear
- Three gas supply sources:
  - Own low-grade natural gas (Saltzwedel)
  - Lignite gasification (Schwartze Pumpe), extensive network operated by VEB Verbundnetz Gas
  - Russian gas imported via Czechoslovakia, goes to East Berlin on same route as gas to West Berlin
- Six refineries with 25 million tons/year capacity, largest 10 million tons/year at Schwedt (on Oder River, supplied via Friendship pipeline)

Table 5: East German energy

Both of these aspects of EC policy are highly relevant to the energy and petrochemical sectors when East Germany joins with West Germany and hence becomes part of the EC.

Tables 3 and 4 give a summary of current EC energy and related environmental policies. They represent a large agenda, which is constantly evolving. The liberalisation of Eastern Europe and concern about prospects of global warming add two further dimensions, which can be expected to give a considerable push to the re-focusing and updating of the whole complex of policies.

Two policies of immediate relevance should be highlighted. The first is the Internal Energy Market policy, in which the Commission is aiming to introduce competition and consumer choice into the gas and electricity businesses, having seen the so far successful move to open access in the American gas industry. A step has been taken with the recent approval of the Directive on Electricity Transit but some important operators in the gas business have, however, been fighting hard to prevent what they see as the disaster of 'gas-to-gas' competition. None has been more vocal than Ruhrgas, which has now made a bid to extend eastward its strong influence in the German gas business.

The second key policy is represented by the Large Combustion Plant Directive, which aims to combat acid rain. Obviously, there is a major task ahead to bring East Germany — and some other aspiring EC countries — into compliance with this policy, particularly in the electricity generation and heavy chemical sectors.

East German energy

A summary of basic facts on the East German energy industries is given in **Table 5.** Recent publicity makes it unnecessary to dwell on the dominance of lignite-burning, except to note that West Germany is also a major user of lignite for power generation. However, East German lignite is generally of lower quality, compounding the problems of environmental impact.

Natural gas and medium Btu town gas are distributed separately in East Germany. Natural gas supply is partly from the USSR via Czechoslovakia, with some low-quality indigenous production. Town gas is distributed throughout the country via an integrated network, with centralised production by lignite gasification*. The network is operated by Verbundnetzgas (VNG), which sells to industry and to regional distributors. The electricity industry has a similar transmission organisation, Verbundnetz Energie, which buys from various power producers and manages electricity trade with other countries.

Connection of East Germany with the West European electricity network is seen as one priority, and for some time a link to Berlin has been under construction. Originally intended to link West Berlin to the Federal German system, this will become an important element in the integration of the overall East German system and additional links are in hand. The West German system itself is integrated with other continental countries, with coordination by the UCTPE organisation. This raises the possibility of power

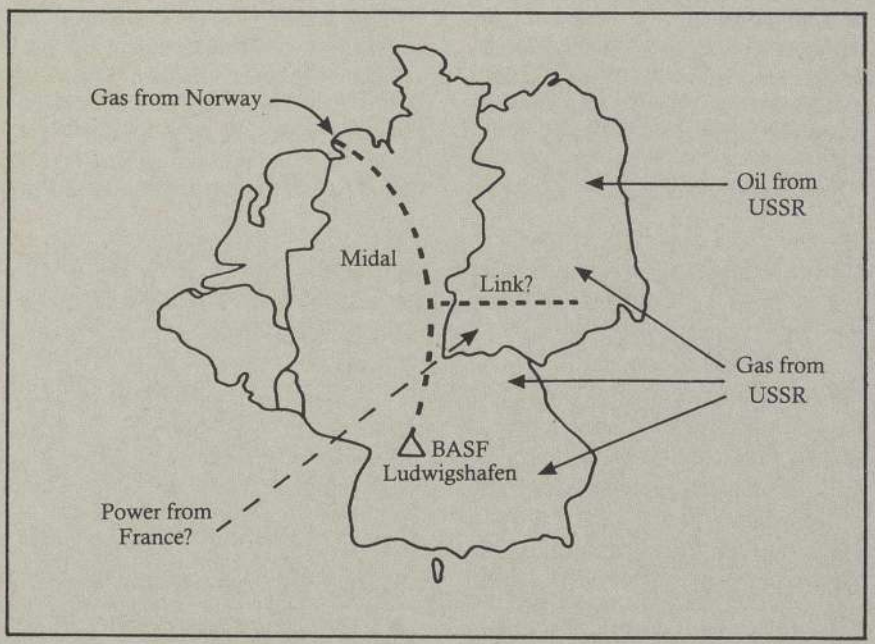


Figure 2: Energy imports

supply to East Germany from other countries, for example France, as illustrated by **Figure 2.** This should give considerable extra flexibility to solve problems on the generation side and may provide a test of the operation of the newly-approved Directive on Electricity Transit.

Also indicated by **Figure 2,** are the plans to feed in natural gas from West Germany. The scheme shown is Wintershall's proposed Midal system, which had already planned a branch through to the Leipzig/Dresden area before the breaching of the Berlin wall. Since then, further proposals have arisen and three West German companies have made undertakings to supply natural gas to East Germany.

East German refinery capacity, reported at 25 million tons per year, is well ahead of demand at around 16 million tons. This is in contrast to the situation in West Germany, where crude processing capacity only covers 75 percent of demand. The largest refinery is at Schwedt-on-Oder, supplied with Russian crude via pipeline. Of course, since German Monetary and Economic Union on 1 July, this oil represents a hard currency earner for the USSR.

Table 6 gives a summary of the petrochemicals situation in East Germany. Some of the industry is relatively modern and uses Western technology, with the antique carbide-route acetylene operation at Schkopau as the major exception.

German unification

There are a multitude of issues to be resolved in the German unification process, with energy and the environment high on the list. **Table 7** lists issues where the environmental aspect is important. However, it is difficult to treat these in isolation from other policy questions, notably competition policy.

This policy interaction is shown most clearly in the case of the electricity industry, where the closure on safety grounds of the Griefswald nuclear units and the general problem of inefficient and polluting power stations, poses probably the major problem in the energy sector. Urgent and expensive action is needed but the idea of handing over the system to one group of major West German utilities has been blocked and a rival bid has emerged from a second group.

A similar impasse has arisen in the gas sector, where Ruhrgas has proposed to take a 35 percent stake in Verbundnetzgas (VNG) and has run into opposition from the EC Competition Directorate. With two German governments, two German cartel offices and the EC Commission, all becoming involved in these questions of restructuring the energy industries, a lot of different interests will have to be resolved. It would seem to be totally against the whole trend towards political and economic liberalisation, if the dominant West German energy companies were to be able to replace a state monopoly with a private monopoly.

If an undogmatic approach were to be taken, it would seem that a combination of public or joint ownership of basic networks, with common carriage obligations, would be a logical basis from which to proceed. There could then be a fully competitive position in the commodity, with a transport network operated on a common basis in a similar manner to a road system. This need not exclude the construction of other pipelines on a private basis.

As noted earlier, the situation on the oil and petrochemical sectors is very different, with some urgent adjustments required for competitive survival in what will very quickly become a very open market-place. Because oil product transport is relatively flexible, managing adjustment to a competitive market should be easier than is the case with gas or electricity. Already, companies such as Aral and BP have moved to set up retail operations. However, the refinery system is likely to see some revamping, with the possibility of links to the West European pipeline system and the need to supply unleaded gasoline.

As with the oil industry, the West European petrochemicals business is relatively fragmented. Given the apparent hesitance of West German companies to take over the East German industry, it is possible that two or three local concerns will evolve and be floated on the open market or become part of non-German groups.

The process of German unification shows every sign of accelerating the pace of European unification and is providing a test-bed for key policies in the economic, energy and environmental areas. Whilst many of the issues can be seen as inner-German matters, there is a often a clear pan-European dimension, and the task in East Germany is so large that a pan-European effort is clearly called for. ■

●	Acid rain	– Lignite burning
●	Urban air quality	– Lignite burning
		– Auto emissions–eliminating the Trabant
●	Global concerns	– Improved energy efficiency will reduce carbon dioxide emission
●	Nuclear power	– Safety concern with existing nuclear plants
		– Role in displacing lignite?
●	Chemical industry	– Improving efficiency
		– Pollution prevention

Table 7: Energy/environmental issues in East Germany

- Mainly concentrated at three sites near Leipzig
- Steam crackers at Böhlen and Leuna, total capacity 460 kt ethylene, 220 kt propylene. Linked to Litvinov in Czechoslovakia
- Olefin derivatives plants mainly at Leuna and Schkopau, supplied by pipeline from Böhlen
- Schkopau (Chemische Werke Buna) has large carbide process acetylene plant. Acetylene is used mainly to make acetic acid and VCM
- Aromatics production is at Schwedt
- As well as modern facilities, some very old plants are in use

Source: East European Petrochemicals, Chem Systems, 1989

Table 6: East German petrochemicals

This article is based on the author's presentation to a seminar, 'The German Opportunity', held in London in May.

***Gas manufacture is by Gaskombinant Schwartze Pumpe (GSP), who have developed an entrained flow high pressure gasification system, with a dry feed system. (Schwartz Pumpe is a locality whose name derives from the days of the Black Death — not from the use of lignite!)**

Profitability improves in refining and retailing

By Silvia Pariente-David, Director of International Industry Services, and Andrew Hill, Oil Economist, DRI/McGraw-Hill

West Germany is the single largest consumer of oil among the EC countries (German oil consumption accounts for approximately 23 percent of total EC oil demand). Germany dominates for all petroleum products, except heavy fuel oil. The German market for heavy fuel oil is actually the smallest among the four major European countries. The German market for heating oil is particularly large; Germany alone accounts for 34 percent of total EC demand for heating oil.

At the same time, Germany is, among the major European countries, the most dependent on imports to cover its requirements in petroleum products. Imports represent 40–42 percent of German oil consumption. German refining capacity indeed now accounts for only 13 percent of total EC capacity, whereas it represented nearly 17 percent in the early 1980s.

As in the rest of the EC, most of the oil is consumed in the transport sector. The second largest sector in terms of oil consumption is the domestic sector, which accounts for a much larger proportion of oil consumption than in the other EC countries. On the other hand, only a small proportion of oil goes to industry and the power generating sector. This structure of oil demand by sector is reflected in the structure of demand by product. Germany, along with France, has the smallest proportion of heavy fuel oil in inland oil demand. The emphasis is light products and middle distillates. The market for each oil product is discussed briefly below.

Automotive fuels

Automotive fuel demand continued to increase in 1989 but at slower pace than in the previous three years. Gasoline consumption was virtually flat compared to 1988. Preliminary indications are that gasoline demand is picking up in early 1990. The penetration of unleaded gasoline is making further advances, with unleaded sales reaching nearly 67 percent of total gasoline sales in March 1990. To encourage the penetration of unleaded, a tax differential in favour of unleaded was introduced in April 1985 and further increased in January 1986 and January 1988. This, together with incentives and regulations encouraging the use of clean cars and the environmentally consciousness of German drivers encouraged the rapid penetration of unleaded gasoline — from 11 percent of gasoline sales in 1986 to 56 percent in 1989. Regular unleaded gasoline was phased out in 1988. A new grade of unleaded gasoline was introduced in 1989, SuperPlus, of 98 RON. The structure of gasoline sales in March 1990 was:

Premium Leaded	33.5 percent
Regular Unleaded	34.7 percent
Euro-grade (95 RON) Unleaded	25.1 percent
SuperPlus (98 RON) Unleaded	6.7 percent

Diesel consumption progressed by nearly 5 percent in 1989. Most of the strength stemmed from demand for freight transport. Consumption of diesel by private passenger cars grew only moderately and the share of diesel in automotive fuel demand by private

Consumption by Sector (% of Total)

	EC	Germany
Industry	10.5	8.4
Domestic	22.1	33.6
Transport	41.0	40.5
Non-Energy Use (Including power generation & losses)	12.0	13.1

Consumption by Product (% of Total)

Light Products*	35.9	36.3
Middle Distillates	41.7	45.9
Heavy Fuel Oil	16.2	8.4
Other	6.3	9.4

**LPG, naphtha, gasoline, refinery gas.*

Table 1: Structure of inland oil demand in 1989

passenger cars has been relatively stagnant at around 15 percent (in Germany, 34 percent of automotive diesel is consumed by private passenger cars). The share of diesel car in new registrations reached a peak in 1986 at 27 percent. The popularity gained by diesel cars in the early 1980s disappeared gradually over the last three years as diesel cars lost their image of low-polluting cars, the tax incentives on diesel cars was suppressed (in 1988) and unleaded gasoline became more widely available. The share of diesel cars is expected to stagnate at around 12 percent of total cars.

Diesel consumption is projected to continue increasing rapidly in the early 1990s, essentially because of freight transport, whereas gasoline consumption is expected to grow only 1–1.5 percent p.a. as the number of cars only increase very slightly.

Heating oil

The German heating oil market, and statistics on volumes of deliveries, are extremely sensitive to consumer stocking patterns. Secondary and tertiary storage capacity amounts to over 32 million tonnes, or the equivalent of one year of consumption. With such a large storage capacity, German consumers have the ability to buy when prices are low and to run stocks down when prices are high. Consumers do not necessarily buy ahead of the winter season (this is evident in the lack of seasonality in German consumer stock changes) but rather when the price is attractive. Consumer stocks were built up to record levels at the end of 1988, ahead of the January 1989 tax increase on heating oil. Because of high stock levels, of relatively firm spot gas/oil prices in 1989 and of higher taxes, consumers kept their purchases low in 1989. As a result, deliveries of heating oil (which include secondary and tertiary stocks) declined by 21 percent in 1989. Over three-quarters of that 7.6 million tonnes decline was due to a swing in consumer stocks. Consumption at the burner tip was down only an estimated 5 percent. The 1989 consumer stock draw was concentrated in the first half of the year, while stocks were built up in the second half of 1989. Preliminary figures indicate an increase in heating oil deliveries of 26 percent in the first four months of 1990.

Independently of these large swings in deliveries due to the consumer stock effect, the underlying trend is for a decline in heating oil demand as natural gas is increasing its penetration of the space heating market. More competitive prices — following the tax increase on heating oil — environmental soundness and convenience all favour the use of natural gas for space heating. In 1989, 320,000 dwellings were new users of gas for space heating and 32 percent of German dwellings are now heated by natural gas (the figure for heating oil is 45 percent). The total share of natural gas in the residential and commercial sector increased from 24 percent in 1988 to 27 percent in 1989, while the share of oil declined by an equivalent amount. The penetration of gas in this sector, which is relatively low in Germany, is expected to continue increasing over the next few years.

Heavy fuel oil

Deliveries of heavy fuel oil have been declining steadily since 1986. Heavy fuel oil has lost sales and market share in both its main markets — industry and power generation. Traditionally, oil had to face stiff competition from solid fuels in these markets, especially in the power generating sector. Recently, natural gas has also been gaining ground at the expense of oil. More stringent environmental regulations are expected to continue to act in favour of natural gas.

Refining

The German refining sector has been subject to a drastic rationalization process in the early 1980s, with severe cuts in capacity. The number of refineries was reduced from 31 to 15 between 1978 and 1989. At the end of 1989, the total primary distillation capacity was 78.3 million tonnes, compared to 159.4 million tonnes at the end of 1978 (a reduction of over 50 percent). One more refinery was closed in 1989, the Wintershall refinery in Mannheim. The Mobil mothballed refinery in Wilhelmshaven is still up for sale. The latest rumours are that Beta Refining & Marketing, a company related to the trader Bulk Oil, is the new potential buyer and that the refinery would be reopened before the end of the year. Primary distillation capacity at the Wilhelmshaven refinery was 8 million tonnes per year before it was mothballed.

As a result of the drastic cuts in primary distillation capacity, the utilization rate has increased to over 88

		Conversion					
	Primary Dist.	*Vacuum Dist.*	*Cat. Cracking*	*Hydro Cracking*	*Thermal Cracking*	*Visbreaker*	*Coker*	*Reforming*
Shell/Hamburg	4.30	2.50	0.76	—	—	0.82	—	0.70
DEA/Heide	4.00	1.60	0.43	—	—	0.75	—	0.78
Holborn Europa/Hamburg	3.50	0.80	0.90	—	—	—	—	0.60
Wintershall/Lingen	3.20	1.75	—	1.00	—	—	0.84	1.18
Wintershall/ Salzbergen	0.30	0.15	—	—	—	—	—	—
Shell/Godorf	8.50	4.00	—	1.50	1.00	0.40	—	1.66
Ruhr Oel/ Gelsenkirchen	10.50	2.60	0.30	1.50	—	0.88	1.50	1.70
DEA/Wesseling	4.50	2.80	—	2.05	—	1.50	—	0.72
ESSO/Karlsruhe	7.50	3.00	—	—	1.50	1.35	1.10	1.30
OMV/Karlsruhe	7.00	5.76	3.50	—	—	1.80	—	1.40
Mobil/Worth	4.78	2.50	1.03	—	—	—	—	0.61
DMP/Burghaussen	3.40	—	—	—	—	—	1.40	—
Neustadt	7.00	2.50	1.30	—	—	0.68	—	0.75
ESSO/Ingolstadt	4.70	1.75	1.30	—	—	—	—	0.67
RVI/Vohburg	5.11	2.92	0.94	—	1.22	—	—	1.51
Total	78.29	34.63	10.48	6.05	3.72	8.18	4.84	13.58

Table 2: German Refining Capacity — End of 1989 (mt/yr)

Company	*Total No of Outlets*	*Self Service*	*Retailing Diesel*	*Retailing* Euro-Unleaded*
Aral	2880	2880	2800	2831
DEA	1921	1921	1921	1858
ESSO	1727	1604	1727	1703
Shell	1686	1633	1666	1645
BP*	1496	1412	1367	1401
AVIA	1052	1026	984	824
FINA	544	444	486	481
CONOCO/JET	435	435	430	435
Elf	421	412	421	412
Aglip	390	390	390	385
Total*	257	243	249	231
Subtotal Major brands	12789	12400	12501	12205
Regional brands total	828	796	789	799
Free-stations** and other	4654	3840	3938	3835
Total	18271	17036	17228	16839

**Includes super markets: 700 filling stations
†excludes highway filling stations
*Estimate

Table 3: Number of Service Stations per Company† (end of 1989)

percent in 1989 (crude throughputs only), the second highest utilization rate in the EC after the UK. The rationalization process was accompanied by upgrading of refineries still in operation. Conversion capacity amounted to 33 million tonnes at the end of 1989 and Germany has now the highest ratio of upgrading to distillation capacity in Europe — 42 percent compared with an average for the EC of 26 percent. Although profitability has improved as a result of the rationalization and upgrading of the refinery sector, earnings remain insufficient and importing products is attractive. Refining costs are higher in Germany than in other EC countries because of much stricter safety and environmental protection standards. This additional cost is estimated by the oil industry association at DM 4.70–6 per tonne ($1.2–1.5/barrel) and it could increase to DM 25–34 per tonne ($6–$8/barrel) in 1993 if West Germany unilaterally tightens environmental protection rules.

Retailing

Motor gasoline and automotive diesel are sold either through a network of filling stations or directly to end-users. In Germany, 98 percent of gasoline and 40 percent of automotive diesel are sold through the network.

The number of West German service stations fell by 387 last year to 18,271; by comparison, the number of filling stations was 44,400 in 1970. In addition, there are 271 motorway filling stations. Of the 18,271 filling stations, 17,036 are equipped with self service facilities and 17,228 retail automotive diesel. Ninety-two percent of the filling stations sell Euro-grade unleaded gasoline.

The five largest companies dominate the retail market, with 53 percent of total service stations and over 70 percent of total gasoline sales. The largest retailer is ARAL (owned 56 percent by Veba Oel, 28 percent Mobil, 15 percent Wintershall and 1 percent various), with a market share of nearly 25 percent. The second largest service station network is owned and operated by DEA, a company formed in 1989 when RWE acquired Deutsche Texaco and combined it with its existing oil division UK Wesseling. The other major service station operators are ESSO, Shell, BP and AVIA. There are approximately 1,100 free non-brand service stations in Germany and a lot of very small stations. There are only 700 service stations operated by supermarkets (not quite 4 percent of the sites).

As the number of outlets was reduced by 70 percent between 1970 and 1989, the average throughput of service stations increased from 35 cubic metres/month to 235 cubic metres/month. Germany now has the second largest throughput in the EC, just after Spain (300 cubic metres/month on average) and well above the United Kingdom (150 cubic metres/month), France (100 cubic metres/month) and Italy (70 cubic metres/month). The German retailing network has now reached a stable situation, after the drastic rationalization process of the 1970s and 1980s, and profitability has been restored in 1987. In 1989, the profit margin on retailing and distribution was 12.5 percent. The price structure of one litre of Euro-grade gasoline is in early 1990:

Refinery Gate Price	26.8 percent
Taxes	63.8 percent
Distribution and retailing costs	8.2 percent
Profit margin in retailing	1.2 percent

For a pump price of 1.21 DM per litre, the profit margin in distribution and retailing is 1.5 pfennigs per litre. ■

Obituary: Angus Beckett

ANGUS Beckett CB, CMG, undersecretary at successively, the Ministry of Power, the Ministry of Technology and at the Department of Trade and Industry, has died at the age of 80.

Mr Beckett made an enormous contribution to the UK oil industry and is chiefly remembered for almost singlehandedly devising the scheme for awarding North Sea exploration and production licences.

Trained as a geographer at Sidney Sussex College, Cambridge, he went on to gain a professional qualification as a geologist which he used on the Cambridge Iceland expedition in 1932. After several years as a preparatory schoolmaster, he entered the wartime civil service in 1940, becoming principal private secretary to the minister of fuel and power by 1946. From 1947 to 1959 he was assistant secretary at the ministry, during which time he was posted to the British Embassy in Washington from 1950 to 1953 as petroleum attaché.

Sir Philip Jones, Chairman of Total Oil Marine plc, a company of which Mr Beckett was a director, said: 'Angus Beckett made a most significant contribution towards the development of the North Sea.

'He was a key man who brought about the opening up of the North Sea as a commercially viable operation. He was especially helpful in bringing together oil companies and government departments and saw what was the right thing to do to get the scheme going.'

Significantly, Sir Philip said Mr Beckett's scheme of awarding blocks as opposed to the later method of auctioning tried in the 1970s, was the correct method to attract companies at the time.

'Without Angus's insight and enthusiasm, exploration and production in the North Sea would have been delayed for a number of years, if indeed it had got off the ground at all.'

OIL INDUSTRY NURSES SYMPOSIUM

27–28 SEPTEMBER 1990

Nurses in all branches of Occupational Health in both Petrochemical and other Industries will benefit from this Symposium to be held at The Institute of Petroleum. The following papers will include new and topical issues, which reflect the changing and challenging position of today's professional nurse.

Thursday 27 September

Keynote Address
Dr John Brothwood, Chief Medical Officer, Esso UK plc
Project 2000 and the Specialist Practitioner — Implications for Occupational Health Practice
Mrs Ruth Alston, Education Officer, English National Board
Professional Conduct and Accountability
Mr Reg Pyne, Director of Professional Conduct, United Kingdom Central Council
The Roundabouts of Business Take-overs
Mrs Eleanor Wilson, Regional Nursing Officer, BP Exploration Ltd, Glasgow
The Offshore Pharmacopoeia
Mr Bill Morgan, Senior Medical Supervisor, Shell Exploration and Production
Money Matters
Mr Paul Boni, Director, Berry, Birch & Noble
European Community — 1992 — How it may affect Occupational Health
Mrs Cynthia Attwell, Head of Occupational Health and Safety Unit, Birmingham City Council

Friday 28 September

Upstream View of Exploration and Development in the Eastern Block
Mr Paul Jennings, Petroleum Economist, BP International Ltd.
Innovations in Occupational Health Nursing Education — A Distant Learning Approach
Mrs C Anne Lowis, Co-ordinator of Health Courses, and Dr Henry I Ellington, Head of School Educational Development Unit, Robert Gordon's Institute of Technology, Aberdeen
Legal Issues in our Work
Mrs Diana Kloss, Senior Law lecturer, University of Manchester

For a copy of the registration form, please contact **Caroline Little,** The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR. Telephone: **071-636 1004.** Telex: **264380.** Fax: **071-255 1472.**

IFEG

INFORMATION SUPPORT FOR THE ENERGY INDUSTRIES — AN EVALUATIVE APPROACH

Tuesday 9 October 1990

To be held at The Institute of Petroleum, London

There are many different ways of providing information services in response to industry needs. It is not always easy to ascertain which method of approach would be the most effective or the most economically viable.

This conference will seek to establish an evaluative aspect to information systems within the energy industries. It will examine alternative ways of organising and retrieving information with the emphasis on practical applications.

Speakers will give presentations based on their professional experience and expertise.

Topics to be covered will include:

*Market Research
*Online versus Traditional Methods
*Records Management
*Centralised or Decentralised Systems
*Environmental Data
*Standards
*Cost Justification

For a copy of the registration form, please contact
Caroline Little, The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR.
Telephone: **071-636 1004.** Telex: **264380.** Fax: **071-255 1472.**

Recognition for Castrol in Burmah reshuffle

After more than a century in the oil industry, Burmah Oil has changed its name to Burmah Castrol plc.

In a move which indicates the strength of Castrol, the lubricant division within the group, Burmah have introduced a new management and operating structure to eliminate the duplication of corporate and divisional head office functions and to speed up communications and decision making.

Part of the package includes the appearance of Castrol, brought by Burmah 24 years ago, in the company's name. Last year Castrol, one of the world's largest lubricants merchants, contributed 67 percent to Burmah Oil's trading profit.

The company believes that the reorganisation and new name, coupled with a senior management reshuffle, will strengthen its position as a leading international marketer of specialised oil and chemical products.

Mr Lawrence Urquhart, Chairman and Chief Executive of Burmah Castrol, said: 'Changing the name to Burmah Castrol will give the company and its operations a greater visibility worldwide and assist our development strategy.

'The world-renowned Castrol name is a very valuable asset and should be given the greatest possible prominence. With lubricants accounting for more than 60 percent of trading profit in 1989, it is also fitting that we should formally acknowledge the importance of Castrol to the company as a whole.'

The most important structural change is the merging of the Burmah and Castrol head offices, and the establishment of three international business groups: lubricants, chemicals and fuels. In part of a senior management reshuffle, Mr Jonathan Fry, the Castrol chief executive, is to become managing director responsible for the operations of the three business groups.

Mr John Ellicock, previously chief executive of the Speciality Chemicals Division, will lead the European lubricants operations; Mr John Griffiths, deputy managing director of Castrol, will take over the chemicals group and join the main board, while Mr Tim Stevenson will head the fuels group. Mr Brian Hardy, formerly Castrol's finance director, will assume the position of finance director of Burmah Castrol.

Mr Urquhart said: 'These organisational changes are in accordance with our strategy of focusing on key strengths, which we successfully pursued throughout the 1980s. The management team is a strong one, with a proven track record.'

This strategy has been the underlying feature of Burmah's management since the turbulent events which affected the company in the early 1970s. In February 1974, Burmah enjoyed a blue chip status within the investment community as a small integrated oil company with a market capitalisation of £700 million. Twelve months later, this figure has dropped to £55 million, as the Burmah share price plummeted from 486 pence to 37 pence.

From the late 1960s the company had adopted an aggressive acquisition programme building on its 23 percent stake in BP and 3 percent stake in Shell.

These holdings provided 65 percent of Burmah's earnings, the rest made up from the company's declining Indian operations and newly acquired Castrol lubricants business.

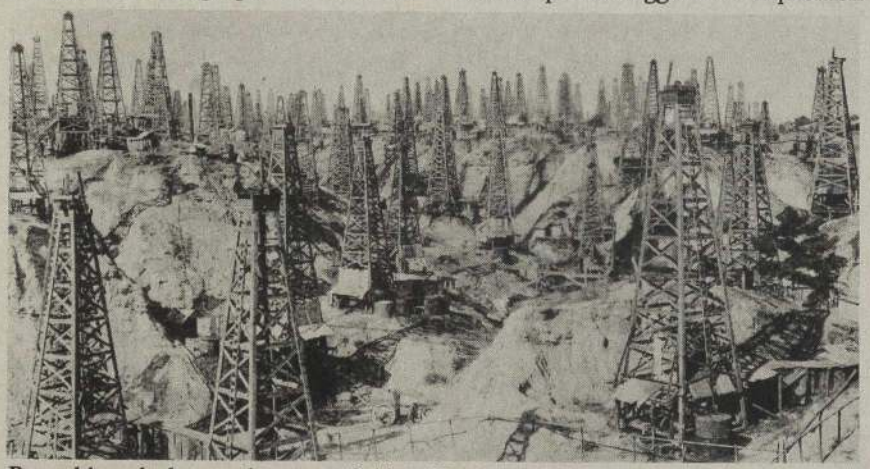
The acquisition programme between 1969 and 1974 included spending £450 million on downstream companies involving firms like Rawlplug, the industrial and DIY business. There was also a rapid shipping fleet build-up as well as more investment in the North Sea via the Signal Oil and Gas Company — Burmah's traditional areas of oil and gas exploration and production.

But in 1973–74 OPEC quadrupled the price of oil, the bottom subsequently fell out of the tanker market and the loan needed to purchase Signal Oil had to be renegotiated.

Significantly Burmah's holding in BP fell by 60 percent around the same period because of a stockmarket crash which meant a massive asset divestment, including the BP stake to the government, had to take place.

The new strategy of concentrating on core businesses saved the company and brought about radical restructuring throughout the late 1970s and early 1980s. By its centenary year in 1986, Burmah had not only disposed of all its peripheral activities but had also moved away from active involvement in oil exploration and production. The group's focus now centred on the downstream, in particular the international marketing of lubricants and speciality chemicals.

During the restructuring, Burmah's oil and gas interests were let go to become the fledgling BNOC, which in turn became Britoil. Ironically, Britoil was itself taken over by BP, originally the Anglo-Persian Oil Company, formed by Burmah in 1909. Because of the company's historic links with the industry, Burmah is to be retained in the company name. Mr Urquhart said: 'The Burmah name retains the goodwill, prestige and historic associations of the company, which was formed over 100 years ago.'



Burmah's early days — the reserve fields at Yenangyaung.

Mark Scruton

Oil shipments to the United States: a two-tier market?

By Judith Gurney

Although US Coast Guard records do not indicate more frequent tanker accidents in US waters in recent years, there is unquestionably wider coverage in the national media of actual and threatened oil spills. A direct result has been a dramatic increase in the liability exposure of tanker operators. Public outcries for prevention — and for punishment — has persuaded some oil shippers to take drastic precautions. In mid-June, as the supertanker *Mega Borg* was burning out of control in the Gulf of Mexico and threatening a massive oil spill, Royal Dutch Shell announced that shipments of crude oil and black oils in tankers owned or operated by Shell would no longer discharge cargoes at any US ports except for the Louisiana Offshore Oil Port (LOOP), a facility 18 miles offshore linked by pipeline to refineries in Louisiana and the MidWest. Shell explained its decision by arguing that 'the legal environment in the USA is a complicated mixture of state and federal laws' and 'consequently a shipowner . . . may face largely uninsurable exposure to claims which far outweigh potential commercial reward from such trade.' Shortly thereafter Elf Aquitaine, which had chartered the *Mega Borg*, also banned its tankers from US terminals. Fina and AP Moeller, an independent shipper, followed suit.

Uncertain legal environment

After months of delay, by July passage of the Oil Pollution Act was assured, if not before the Congress adjourned on 6 August, then shortly after it returns on 6 September. The final legislation dropped an earlier provision allowing the United States to participate in the international conventions which govern and limit the liabilities of ship and cargo owners worldwide in the event of an oil spill. The argument advanced for this omission was that signing these international protocols would pre-empt state pollution laws and prescribe future federal laws. Although the Oil Pollution Act sets a federal liability standard with some defences for tanker owners not guilty of gross negligence, it permits state laws which impose unlimited liability to remain in full force. It is the general policy of the federal government not to pre-empt state laws wherever possible, particularly in the area of environmental law.

Most existing state pollution laws invoke unlimited liability, although they address the issue in different ways. Moreover, 17 states are currently considering more drastic oil spill control and prevention legislation — Alabama, Alaska, California, Florida, Hawaii, Louisiana, Maine, Maryland, Massachusetts, Michigan, New Jersey, New York, Rhode Island, South Carolina, Vermont, Virginia and Washington.

Effect on tanker operators

The individual circumstances of oil shippers have coloured their reactions to this threat. In recent years, the world tanker fleet has consisted of approximately 40 percent independent charter vessels, 10 percent government-owned vessels, and 20 percent major oil companies vessels, with the other 30 percent being combined carriers, Soviet vessels, independent spot traders, and vessels in storage. Some 17 percent of the tanker fleet is owned by Shell, British Petroleum, Exxon, Chevron and Mobil in roughly equal proportions. Companies with large financial assets are better able to fight lengthy prosecution in the American state courts than smaller companies which cannot afford the expense of long-term litigation. There is also the question of adequacy of insurance cover. Tankers can be insured for up to $1 billion but the *Exxon Valdez* incident has shown this coverage to be inadequate. Many companies would not be able to meet claims in excess of their insurance coverage.

Although it was rumoured that other oil companies would quickly follow Shell and publicly announce their reliance on the use of third-party tankers for the discharge of crude oil cargoes in US ports, this has not proved to be the case. The major oil companies appear to want to continue a 'watch and wait' policy. A factor heavily influencing this decision is that of insurance costs. The more companies seen to be avoiding liability exposure in US ports, the higher will be insurance rates for tankers discharging in these ports. All oil companies regularly use third-party vessels anyway for a portion of their shipping needs and they can therefore rely more on these for US crude shipments, if they wish, without making this widely known.

Current views

British Petroleum: BP America does not own any tankers as, under the Jones Act, all cargo from one US port to another must be transported in US-flagged vessels. BP America therefore uses third-party tankers to move North Slope crude from Alaska to the lower US states. British Petroleum Plc says that it is continuing to use its own vessels to ship crude to the United States, primarily to the Louisiana LOOP port, and has no current plans to change this policy.

Exxon: Exxon apparently strongly disapproves of Shell's action. It recently announced that Exxon International Marine affiliates will not outcharter vessels for the carriage of non-Exxon cargoes to or from US waters due to concern over existing and potential shipowners' liabilities. The affiliates will continue, however, to use their vessels to carry Exxon-affiliate crude oil and refined products to and from the United States.

Chevron: Chevron reports that it will continue to use its own vessels for the transport of crude to US ports and will continue to charter vessels as usual. The company insists that it will be selective in the vessels that it charters.

Mobil: Mobil reports that it is continuing to operate as it always has and continuing to study the effect of Shell's action.

Texaco: Texaco believes that the safest approach is to use its own tankers to transport crude to the United States, although it continues to contract for third-party vessels in some instances. The company feels that this is the best decision until it sees how the situation washes out in the coming months.

Amoco: An Amoco spokesman said, with regard to Shell's decision, that the company is not now planning to make any similar move but that it is continuing to monitor actions by other companies very closely. The issue of liability is a very serious one for responsible shipowners, Amoco feels, and the more companies that take such actions as Shell, the greater the impact on transportation into the United States.

Why the hesitance?

It would appear that the main reason that the oil companies are reluctant to rely more on third-party tankers, or at least to be seen to do so, is a fear of the consequences of such action. The greater the reliance on third-party vessels, the more fraught the maritime insurance world will become. Already, Derek Wills, Chairman of Lloyd's Underwriters Association, has suggested that tanker owners may face a shortage of insurance protection to meet their liability exposures in 1991.

What many shipping experts see as inevitable is a two-tier market, with those tanker operators willing to call at US ports charging a premium to cover excess insurance rates and their own risk. Owners of quality fleets may be the ones who decide to avoid the US crude oil trade, leaving less responsible tanker operators as the only ones willing to take the risk. It is indeed ironic that the United States, by trying to provide more stringent criteria to protect the environment, may have encouraged the opposite effect. ■

How futures markets work

By Nick Battley

News of the addition of sour crude to the range of contracts offered by the International Petroleum Exchange (IPE) may well be greeted with enthusiasm by existing market users. However, for others (and there are undoubtedly many of them), futures markets remain largely a source of mystery. Of course, some may not actually admit any ignorance, but are nevertheless keen to readily dismiss futures markets as casinos which bear no relationship to physical markets. The reality is that while speculation is an integral feature of futures, it actually provides the mechanism for non-speculative interests to manage physical price risk, a task which is being increasingly demanded by banks and other financial institutions. The ability of futures to be used for risk management by both producers and consumers means, in the case of crude oil and products, that the potential for futures usage is very large indeed and it must be considered prudent for any concern whether an oil company, a transport company, a local authority or whatever, to assess the value of the opportunities that may be provided by futures trading. The problem in achieving such an assessment though, lies in education.

Many of those who seek education are loathe to contact a broker as a first step, and to an extent, such reluctance is perhaps justified for a broker's strength tends to lie in trading ability rather than teaching skill. Industry presentations may appear to be educationally useful but often they tend to concentrate on new products and advanced techniques without covering the basic theories, leaving any newcomers to the business frustratingly mystified.

What is a futures contract?

A futures contract is a promise to make or take delivery of a specified quantity of a standard specification of product at a certain date in the future. It is only a promise; a futures contract must not be confused with a forward contract which generally represents a binding commitment between the buyer and the seller. Although a futures contract is 'only' a promise, it must have some credibility. This is normally achieved by having the inherent potential for physical delivery (or, in cash-settlement contracts, the exchange of cash to the value of such a delivery).

There are two important points to make here concerning these promises. First of all, the promises are not made between two particular parties. That may seem odd if you were to watch traders buying and selling to each other on the floor of a futures market but, in fact, each seller and each buyer is only making a promise to the market — not to his trading counterpart. Technically, the term 'market' in this case refers to the International Commodities Clearing House (ICCH) which assumes the opposite side of each transaction and guarantees the performance of all trades made on the IPE (and on many other exchanges worldwide).

The second point to note is that the promises can be effectively cancelled by opposite transaction. In other words, if you sold in August, five lots (equal to 500 tonnes) of December IPE gas oil, that would represent a promise made to the market to supply the 500 tonnes of oil in December. However if subsequently you bought, in September, five lots of December gas oil with the promise of receipt of gas oil in December, such a transaction would cancel out your original obligation to the market and you would therefore no longer be called upon to either make or take delivery of the product. If you had not cancelled out the original promise, you would be required to physically deliver the gas oil. In fact, because most transactions are cancelled out before the delivery month expires, only about 0.5 percent of IPE's gas oil turnover is actually delivered.

Hedging

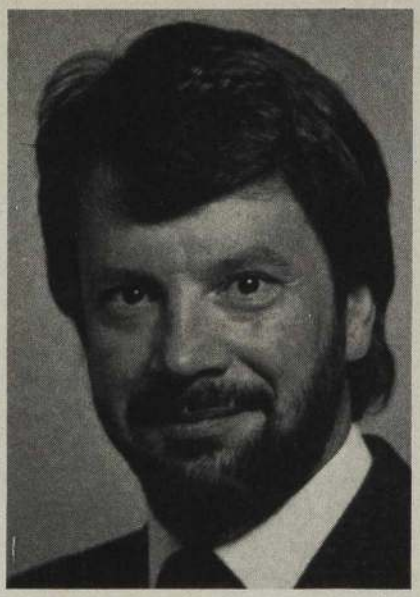
It should now be clear that the key to futures lies in the transactions, not delivery. The principle of using futures to manage price risk lies, in the simplest theory, of making a profit in futures to offset a loss in one's physical business. For example, if you bought one lot (100 tonnes) of IPE gas oil at $150 per tonne (the delivery month is not important in this example), and later sold one lot back to the market at $160 per tonne, you would not only be free of any delivery obligations but you would be showing a profit of $10 per tonne, or $1000 on the one lot contract. In this simple example the market has gone up in value between the time of purchase and sale. Suppose you had been a buyer in a transport company which was contracted to purchase, at a later date, 100 tonnes of physical gas oil from a local supplier. Over the same period as above, assuming the supplier's prices are not fixed but rather based on market values, the cost of that purchase would have increased by roughly the same amount as the futures, so you would have had to pay $1000 more than you had planned. It can be seen that, had the futures transaction been made alongside the physical deal, the profit on the futures would have balanced out the loss on physicals. This method of protecting against a rise in price of a commodity is the most simple form of hedging for a consumer to employ and is known as a consumer's (or 'long') hedge.

For a producer to hedge to protect

against a fall in the physical price, the futures transaction must be reversed (a 'short' hedge). In other words the futures must be sold at, say, $150 and cancelled out by a later purchase at a lower price of $140 to produce a $10 per tonne profit. This method of selling and then buying back at a lower price to produce a profit is a common area of misunderstanding, possibly because it is difficult to grasp the concept of selling something one doesn't have! The easiest way to visualise it is by imagining the receipt of the full amount upon the sale of the futures i.e. one lot at $150 per tonne would give an income of $15,000 on 100 tonnes. To cancel out the futures promise by purchasing one lot would only cost $14,000, leaving a net profit of $1000. However, this view should be kept for the imagination alone because, in reality, transactions are carried out on a system of deposits and margins — the full amount is never received or paid.

Outlined above are the very simplest forms of hedging and as such, they serve to introduce newcomers to the practical applications of futures trading. However, as with many simple situations, they assume a great deal. First of all both examples assume that the futures price moves in favour of the participant, that is to say up, in the case of the consumer who wishes to protect against a price rise and down for the producer, who wishes to protect against a price fall. It has to be said that, in reality, the market is not as predictable as that! Let us suppose that in the case of the consumer's hedge, the market falls instead of rises. It should be obvious that if futures are purchased and later sold at a lower price, a loss will result. The saving factor for a hedger is that his or her physical purchase is likely to cost less than originally planned and that the notional profit will offset the futures loss. It can be argued that without futures participation, the consumer would have been better off. That, of course, is quite true but without the protection of futures, the consumer becomes a slave of the open market. There are many that would argue that the cost and revenue stability which may be obtained by risk management is better than the windfall profits and unexpected losses that may result from remaining unprotected. In other words, a loss of futures is no bad thing if it results from a prudent policy of risk management.

Another assumption made by the foregoing examples is that futures and physicals move by the same amount. There is, of course, no mathematical or



Nick Battley

scientific reason why this should be so and, indeed, there may be instances when the two move somewhat independently. However, it can be assumed that in a market which has good trade participation the two markets should react in concert. The reason is quite simple. As a futures delivery month approaches maturity, its price should tend to line up with the price of prompt delivery physical product. This tendency is created by the participants themselves, because if futures are higher than physicals, for example, trade players will buy the cheaper physical product and sell the more expensive futures contract with the intention of making delivery on the futures market. With such exploitation any difference between the two markets will become eroded until they achieve equal value (a phenomenon known as 'price convergence'). This may be readily understood in the case of a maturing futures delivery month, but what about other futures delivery months which don't have physical price counterparts? Again, differentials are the key. For example, if the maturing delivery month has convergence with the prompt physical price, it should be possible to calculate what the differential should be, in theory, between the first two futures months; the prompt physical price plus cost of holding the product for a month to deliver on to the futures market. Any deviation from that rough formula may be capable of being exploited and that exploitation itself will tend to keep the prices at a differential which represents the views of the trade as a whole. If one goes further forward in time, the differentials between the futures delivery months will still reflect the same basic principle, although they may show some distortion due to anticipated seasonal factors etc. Because of this relationship between the physical market and the futures market and between the various futures delivery months themselves, any movement in the prompt physical price is likely to be reflected relatively uniformly for all futures months.

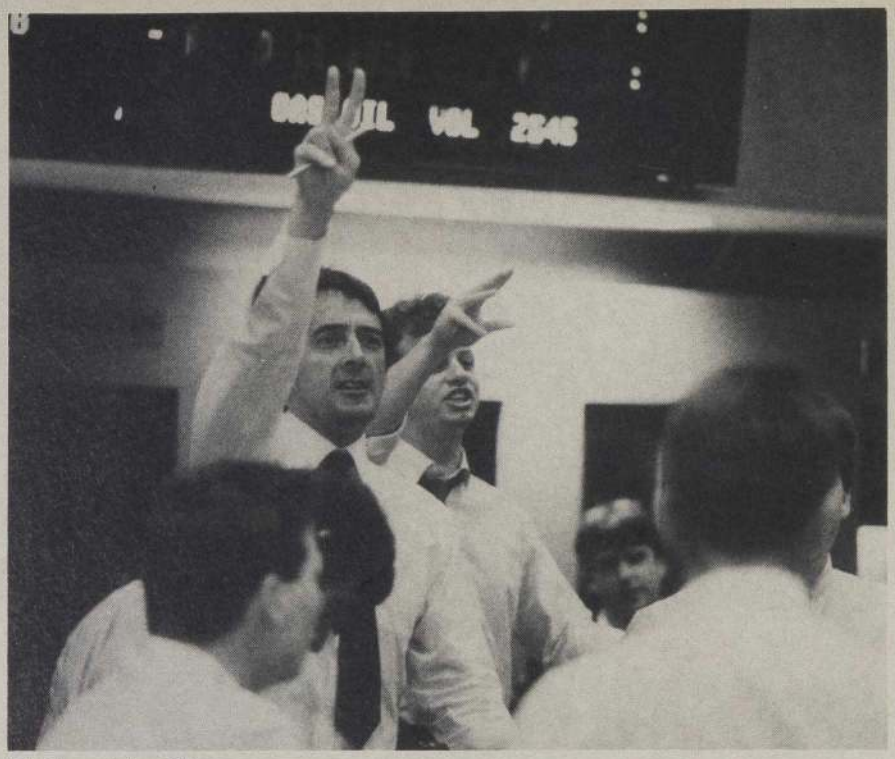
Cash settlement

On the subject of price convergence, it should be noted that the IPE's new sour crude contract as well as its established, and successful, Brent crude contract are both cash settled, mainly because of the difficulty of making delivery in small quantities. The retention of sold or bought positions through to maturity in these contracts does not lead to delivery but to the exchange of cash. For credibility, price convergence with the physical price is still necessary, so it is 'engineered' by the determination (by the Exchange using industry sources and data) of a price which matches the physical market. Potential market users should not be particularly concerned about cash settlement provided there is evidence that the settlement price (ie the value of the contract at maturity) reflects the physical market and is not subject to manipulation. In the case of the IPE this aspect is very carefully monitored.

Speculators

The key to a credible market lies in the interaction of the various groups of players, and that includes speculators. Indeed, it is most important to recognise the part that speculators play in the efficiency of futures markets. While trade hedging practices are usually concerned with the movement of prices over the longer term, speculators (and particularly 'locals' who trade for their own account on the floor of the market), are usually taking a much shorter view; indeed, they may be concerned with price movement over the next few minutes rather than weeks or months. As a result, they are continually buying and selling to try to exploit short term movements and it is precisely this type of trading activity which enables trade hedgers to execute their business smoothly and efficiently.

For example, suppose a hedger wants to sell 50 lots on the market. In a market without much trading activity it may not be possible to sell the 50 lots at one price, because there are simply not enough buyers about. The hedger may then be faced with the choice of either selling as many lots as he can at decreasing price levels or, if that is not



Trading at the IPE

desirable, accepting only a part-hedge at the original intended price. Speculation, however, increases the amount of activity in the market and thereby reduces the threat of this problem. This level of activity can be measured. The Clearing House regularly calculates the aggregate open positions (ie sold or bought contracts that have not been cancelled out by opposing transactions) and markets with higher numbers should be favoured. Trading volumes themselves may be misleading, although it is generally true that the higher the regular volume on a market, the higher the open interest figure. Many potential users are put off futures by the understandable concern that what appears fine in theory may not be the case in reality. Admittedly, the market does not always follow theory; for example, there are cases where price convergence does not occur, or where prices of futures do not move by the same value as the physical market. However, for those who have mastered a complete understanding of the theories, there are a number of advanced ways of using futures with more predictable results. Indeed, through a technique called 'basis trading' it is possible to achieve guaranteed price protection independent of the actual movement of prices.

Basis trading is concerned with the locking-in of differentials and can also be used when the standard contract on which the futures market is based does not match the potential user's physical supply. The IPE gas oil contract is based on the delivery of gas oil into barge in Amsterdam, Rotterdam and Antwerp. At first glance this may hold little relevance for a supplier or consumer in Scandinavia, for example. However, by ascertaining the differential in price to take account of location (and perhaps quality, too), it is relatively straightforward to use IPE futures both to lock-in that differential as well as gain price protection.

Options

Once the principles of futures are understood fully, the subject of options may be explored. Options are simply the purchase or sale of an option to buy or sell a futures contract at a later date at a fixed price. Options may be bought and sold just like futures contracts and together with futures can be used to reduce risks and enhance profits. Although option trading can appear rather complex, it can, like basis trading, create much greater flexibility in price management strategies.

Along with the growth of the IPE over the last few years, there is strong evidence of a growing awareness of futures in the general commercial sector. Awareness itself, though, is not enough. Education is vital both to assess the practical usefulness of futures as well as to provide protection from the expensive pitfalls which may be encountered by the unwary. ■

Exploration and Production Discussion Group Meetings

The following meetings have been arranged for the autumn:

Thursday 13 September	**Onshore Gas Terminals for the '90s**
Thursday 11 October	**Subsea Developments**
Thursday 15 November	**Abandonment — A Review of the Situation**

All these meetings will be held at the Institute of Petroleum starting at **5.30 pm** (tea and biscuits available from 5.00 pm).

Notices of E and P Discussion Group meetings are sent to those IP members who are on the mailing list of the group. Any Institute members wishing to have their names added to the mailing list should contact **Mr A E Lodge** at the Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR. **Tel: 071-636 1004.**

1991
IP Annual Dinner

The Institute of Petroleum's Annual Dinner in 1991 will be held at Grosvenor House, Park Lane, London W1, on **Wednesday 20 February.**

IMPORTANT — PLEASE NOTE

Ticket application forms will be sent to all UK/European individual and collective (company) members as a loose-leaf insertion in their OCTOBER copy of Petroleum Review.

Non-UK/European Members who wish to apply for tickets should contact **Caroline Little** at the IP at 61 New Cavendish Street, London W1M 8AR as soon as possible. Tel: **071-636 1004.** Telex: **264380.** Fax: **071-255 1472.**

The closing date for receipt of ticket applications will be FRIDAY 26 OCTOBER 1990.

FUTURES AND FORWARD MARKETS SWAPS AND OPTIONS
Which Way Forward?
Friday 16 November 1990

The following papers will be presented at this one-day Conference to be held at The Institute of Petroleum in London.

Keynote Address
A Major's Perspective on Risk Management for Itself and Its Customers
Mr Alan Binder, President, Shell International Trading Co.

The Futures Choices: Three Papers
A Second Crude Oil Contract for NYMEX
Mr Patrick Thompson, New York Mercantile Exchange
Do Existing Futures Contracts Meet the Industry's Needs?
Mr Peter Wildblood, IPE, London
A Critical Review of the Existing Futures Contracts
Mr Gordon Watson, Czarnikow Energy

Phibro — A Trader in All the Markets
Mr David Hammer, President Phibro Energy Inc. USA
Swaps and Options in Risk Management
Mr Christophe Chassard, Elf Trading, Geneva
The Hedging Efficiency of the Russian Gas Oil Forward Market and the IPE Futures Contract
Mr David Long, Oxford Institute for Energy Studies
Legal Aspects of Risk Management and Forward Oil Trading
Ms Blanche Sas, University of Dundee
The Problems of Defining the Price of the 'Marker' Crude Oils and Products
Mr Adrian Binks, Petroleum Argus
The Existing Forward Markets
Mr Nigel Graham, Neste Petroleum (Products) Ltd

For a copy of the registration form, please contact **Caroline Little,** The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR. Telephone: **071-636 1004.** Telex: **264380.** Fax: **071-255 1472.**

New insulation for flanges

By R R Gould, Total Energy Management Ltd

Outside the refining industry and where cost savings are equally important, industry and commerce has been looking closely at their traditional method for insulating valves and flanges, each uninsulated valve equalling the exposed area for one metre of similar bore piping and each uninsulated flange equalling the exposed area for half a metre of similar bore piping, according to Energy Efficiency Office Statistics.

R R Gould

While fuel costs in industry are generally higher than bulk heavy fuel oil costs for refineries, the cost of leaving valves and flanges uninsulated has equal importance. A continuously exposed 4″ flanged gate valve at 120°C, heated with HFO at a bulk cost of $75/tonne, radiates heat to a cost of £23/annum while a 6″ valve at the same conditions is losing £52/annum. That is quite a profit loss if one considers the total number of valves in a refinery, more so when new and flexible designs of covers provide additional personnel protection and can be paid for out of the losses in anywhere between one and two years, or much shorter time if the temperature is higher or the outside environment stormy.

A traditional method, used within industry for insulating flanges and valves, has been to encapsulate their shapes with sections of either calcium silicate block, rockwool mineral fibre block or other low 'k' insulation value materials. This encapsulation is then clad with cut and formed aluminium sections, to make a weather-proof and presentable box. As a permanent addition to pipe-runs and where vibrations are not present, clad boxes serve well until they are removed for maintenance purpose. If they do get removed, the chances of them becoming distorted, out of shape or not refilled adequately are frequent, leading to boxes being left off or poorly refitted. Where vibrations are present, box contents can migrate to a low level, reversing the insulation effect by radiating heat through the box metal, when the box metal touches the flange metal. These conditions are also very common where pre-formed aluminium boxes are applied to enclose heater ends, calorifier ends, etc.

Over the past few years and since asbestos became recognised as a hazardous material, alternative materials such as woven fibre-glass cloth, began to find a ready acceptance for insulating awkward shaped hot metal pieces. Originally, hand-made inner and outer skins of woven cloth were stuffed with loose spun fibre-glass or powdered calcium silicate and draped over the uninsulated metal as a muff. These muffs had gaiter hooks stitched at intervals on the cloth, allowing their free ends to be closed with wire lacing, but these early attempts were often ill-fitting, fragile and short-lived.

Since then and because the original muff idea was good in principle, flexible insulation covers for flanges, valves, calorifier ends etc, have been developed to meet a more demanding role. These developments have been introduced to satisfy much more stringent requirements that include quick maintenance access to the equipment they cover, durability and long life in an aggressive environment, besides a tailored fit.

Dependent upon the quality of manufacture, these covers are now CAD shaped for consistency during machine tailoring, their cloths are woven from non-resinous and high temperature resistant drawn 'e' glass fibre, which is aluminised and silicon impregnated. Their characteristics make them fire retardant to part 4 & 7 of the B.S. 476 specification, high temperature proof, rot proof, vermin proof, acid proof, alkali proof and weather proof. They have velcro fastenings on cold faces to permit rapid equipment access and often have glass rope end ties to prevent the passage of convected air currents. They are stitched together with glass thread to stop moisture 'wicking' and thread rot, and are filled internally with mattresses of non-compactable long needle fibre drawn 'E' glass of low 'k' value. Latterly, they are being fabricated and filled with ceramic fibre of very low 'k' value, to allow improved insulation characteristics. Boxes are therefore rapidly losing popularity in favour of the flexible alternative, for new plant application and during refurbishments, since there is no difference between the 'u' values of either.

The paid-back energy savings permitted by this new generation of flexible covers are very much dependent

upon a variety of computed influencing factors: the cost of fuel being used, the temperature of the uninsulated shape, the operational hours, the total heat loss acting on the exposed surface area of the uninsulated shape and the cost of the cover. The graph in **Figure 1** has been generated from multiple heat loss calculations and shows where the benefits are from insulating standard flanged valve shapes with these flexible covers. Selecting a three year pay back limitation from the graph usually permits a 1.5 year average, which for a typical refinery installation and in comparison to a typical industrial installation, could provide a realistic and targeted savings of £100,000 per refinery per annum.

In 1926 and when design pressures and temperatures were rising, the phenomenon of creep in steels above 800°F (425°C) became a concern which prompted its research and investigations. The late Dr R W Bailey read a paper to the World Power Conference on this subject in 1929 and continued with more research into the problem on behalf of the British Standards Institute and at the National Physics Laboratory. The Third Report of findings to The Pipe Flange Research Committee of the BSI by Dr A E Johnson were published in Volume 168 of The Institute of Mechanical Engineers Proceedings in 1954, addended by Dr Bailey and followed with further reporting by H J Bernhard in the Volume 178 Proceedings of 1964.

Essentially, these findings confirm that stress and temperature generate a continuous rate of deformation, or produce plastic strain and creep relaxation for differing grades of material at set conditions. Typically, an initial stress of 17 ton/in^2 on carbon steel bolts at 1,000°F (540°C) and containing a pressure of 1,400 p.s.i., will have reduced on a log scale to permit joint failure in around one-third of a plant's normal lifetime.

This does not take into consideration that 'standard' practice is to use carbon-molybdenum steel for high temperature/pressure application, which has five times better creep resistance than carbon steel, nor that it is customary to retorque flange bolts periodically.

The total calculations and considerations in the development of standards for differing flange shapes and materials, as included above and in such flange selection bibliographs as the 1978 revision VII of the Taylor Bonney International bulletin 502, are complex and intertwined. Besides all of the developed mathematical formula, the considerations also include the spheroidation of grain structures, the compressibility of joint materials, the continued plastic deformation of steels down to around 450°F (230°C) and with some types of flanges, bolt torque decrease as temperature increases. The volume of all these considerations limit their inclusion in this short article, but are mentioned to allay concerns that insulating refinery flanges and valves need be prohibited on maintenance, leakage or safety grounds.

Leaving hot equipments bare of insulation is an expensive option financially and environmentally, now this new generation of covers are developed. Moreover, the new COSHH legislation frees employees to claim damages off employers for injuries suffered in the work-place, when known dangerous conditions are ignored. Certainly this is the case where metals are above the temperatures where burn injuries may occur, there then being no zero-cost-of-fuel dejustification that will insulate the employer against financial penalty.

We believe that insulating hot flanges, valves and other exposed refinery equipments to be a thoroughly sound proposition mechanically, economically and environmentally. As consultants representing the brand leader for these flexible insulation products, we are also in a position to advise the refining industry towards an improved image and profits. ■

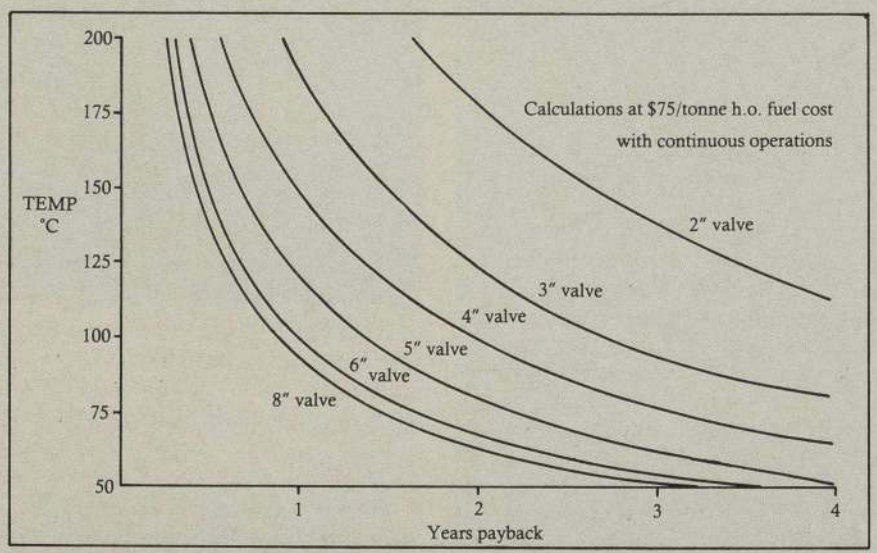


Figure 1: Flexible valve cover investment returns

New system prevents tank seepage

INTERNATIONAL Protective Coatings has developed a system to prevent leakages of oil and other liquids through concrete.

The Xypex concrete waterproofing system is ideal for situations where the concrete bund or storage tank has become unsound, allowing the seepage of oil and other chemicals into the ground, eventually causing pollution of groundwater and streams.

A non-toxic chemical treatment for waterproofing and concrete protection, Xypex actually grows into the concrete, becoming an integral part of the structure.

Xypex consists of Portland cement, fine silica sand and various active proprietary chemicals. An advantage of Xypex on older concrete is that the surface must be wet for its application — so any existing dampness aids its use.

Under catalytic action, water combines with the chemicals generating non-soluble crystals. These migrate into the pores and capillary tracts of the concrete, even against strong hydrostatic pressure.

By this action concrete becomes permanently sealed against liquid penetration from any direction. Xypex's fixed size crystalline form does, however, allow the passage of air so the concrete is able to 'breathe' and become thoroughly dry, preventing water vapour build-up.

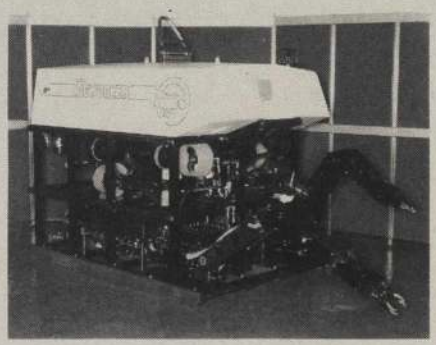
During permeability tests by the US Army Corp of Engineering, two inch thick Xypex treated concrete samples were pressure tested up to a 405ft water head — the limit of the test apparatus.

Untreated samples, used as controls, showed marked leakage but the Xypex treated samples had become totally sealed with no leakage.

Subsea rigworker Singapore bound

OSEL, Offshore Systems Engineering Limited, the Great Yarmouth based subsea engineering company have handed over a rigworker R17, a remotely operated subsea work vehicle, to the Singapore-based company Techno-transfer Industries PTE Limited.

The reconfigured rigworker was designed in order to meet the changing needs of ROVs for the 1990s and the company believes that its flexible approach to satisfying these requirements contributed to this latest export order won against fierce international competition particularly from the United States.



OSEL have also announced that Techno-transfer had placed an order for a second rigworker and tether management system, for delivery at the end of this month.

Weather system

A NEW high speed environmental data acquisition system, which monitors meteorological conditions such as weather and sea state and their effects on offshore installations, has been developed by Marex Technology.

The system, called PACE, is to enter service this year with Marathon Petroleum Ireland Ltd on the Kinsale Head gas field Alpha production platform located in the Celtic Sea.

PACE will provide measurements of windspeed, pressure and temperature and will be linked into the Irish Meteorological Office to provide data for weather forecasting. The provision of this weather information on board offshore installations is necessary to satisfy the Civil Aviation Authority's offshore air traffic control safety requirements for helicopter movements.

New nationwide drumming facilities

SIMON Storage Group Limited has recently commissioned three new automated drumming units at its bulk storage terminals at Immingham, the Tyne and Thames Matex.

Construction of the new facilities, which took the company over four months to complete and were opened in the New Year, represent major investments in excess of £600,000. Whilst the drumming operation at Immingham replaced an existing facility, the developments at the other two terminals were on sites of undeveloped land readily available to Simon Storage.

Discussing the decision to build the three drumming operations, Mr Peter Rendall, Group Marketing Manager of Simon Storage, said 'We decided to build these drumming facilities because of the increased demand for small packages, including one tonne independent bulk containers. Having taken this decision, it obviously made sense to consolidate them at central points of peak demand and for reasons of quality and health and safety. Building the new facilities at existing terminals also provides benefits for both management and control purposes.'

All three drumming facilities are undercover, allowing all-weather operation, and are manned by highly trained operators. The facilities possess the latest up-to-date fully automated flameproof equipment including vapour extraction technology, electronically-controlled filling, built-in safety features, computerised stock control and controlled on-site blending. As a result, typical drumming capacity at each site is about 50 drums per hour, and drums of 40–400 kilos can be handled.

A wide variety of products, including chemicals, lubricants, fuels and vegetable oils, can be handled, in steel or plastic drums, and each facility caters for the needs of either bulk customers that already use the terminal or 'one-off' clients.

Specialised drumming facilities

Peter Rendall said: 'This is an effective way of selling volume in small packages, providing flexibility or supply in a convenient and cost effective manner.'

Cable-free emergency PA system

A new type of emergency public address system with a greatly improved ability to survive accidents has been developed by the British company Private Mobile Radio Limited (PMR), in collaboration with the offshore oil industry.

This follows the Department of Energy's request in its interim technical report on events surrounding the *Piper Alpha* disaster, that platform operators re-evaluate their emergency systems to ensure that they are, in fact, capable of operating during accident situations.

Called PASCAL (Public Address System CAble-Less), PMR's new system replaces vulnerable cables with radio links, using radio-loudspeakers to overcome the serious shortcomings of cable systems under emergency conditions. It has been designed for use in emergencies to provide vital areas of a platform or plant, such as muster control points, lifeboat stations and main escape routes, with reliable public address systems at all times.

Normally powered from the local mains supply, each independent PASCAL unit also has its own integral standby batteries with sufficient capacity for one hour's operation in the event of mains power failure. A major benefit is that each radio loud-speaker will remain operational regardless of damage to other units in the system.

PASCAL, emergency public address system.

New mud system from Dow

DOW Chemical Company's claims its new mixed-metal hydroxide-based (MMH) drilling fluid systems exhibits unique rheology that combines astonishing solids-suspension and low-viscosity flow characteristics.

Dow says the MMH-based muds drill wells faster, cleaner, with less trouble time, and with substantially lower drilling costs than conventional fluids, and complies with EPA requirements and compatibility with fresh and salt water systems.

This is due to the chemical and physical properties of MMH. The MMH crystals interact with bentonite or attapulgite particles to develop a distinctive gel structure. Exhibiting discontinent behaviour, the gel structure functions as an elastic solid at rest; when shear force is applied, however, the structure is fractured and free flow occurs along the fracture lines.

Results of both laboratory and field tests demonstrate the suspension characteristics, shale inhibition, resistance of contaminants, and thermal stability of MMH-based drilling fluid systems. Comparative caliper logs illustrate the ability of an MMH-based fluid to a drill well nearer to gauge, through various formations, than a conventional bentonite system. Mud up procedures as well as testing and maintenance recommendations are included in a comprehensive handbook by Dow.

Heavy torque from Hydra-Tight

HYDRA-TIGHT Ltd. of Aberdeen have proved the design of its latest torque tool, one of the most powerful currently available, during a recent wellhead source refurbishment.

The BT45 bar tool is a large hydraulic torque wrench and one of a range of tools specially designed for tightening and breaking out very large nuts, up to 7.5/8" AF (180mm) with torque capacities up to 68,400lbs ft (90,000Nm).

The BT45 showed it had the capacity to generate 45,000lbs ft of torque, designed for use on swing clamps, wellhead systems, BOPs, turbine compressor casings, foundation bolts and many more applications throughout the oil and gas industry.

Hydraulic power can be provided by any suitable pump but Hydra Tight have a complete range of pumps designed to match the pressures of their special bolt tool.

Insertable gaskets

A NEW range of insertable ring gaskets for fast, easy seal replacement in pipework has been introduced by the Dundee-based Industrial Sealants Group of WL Gore & Associates.

Manufactured from pliable yet durable expanded PTFE (polytetrafluoroethylene), Gore-Tex* gaskets come pre-cut from 3/4 inch to 6 inches nominal bore and in 150lb ASA and 300lb ASA ratings (DIN sizes also available). The wide range of sizes suits a variety of applications including pipework and small manways, to minimise downtime and replacement labour costs across a range of equipment.

New seismic method

A NEW method of seismic borehole surveying around the Norwegian Ekofisk K17 well involved an eight-geophone downhole seismic array and over 6000 shotpoints according to Schlumberger project partner, Andrews Hydrographics.

The 3D survey on behalf of Phillips Petroleum covered an area defined by 41 walkaway lines orthogonal to the well bore. Each was 5km long and had shotpoint intervals of 25m.

Schlumberger's downhole seismic array incorporated the eight linked geophones 15m apart, to provide data equivalent to a conventional single geophone survey of nearly 50,000 shotpoints.

Andrews Hydrographics Ltd job was to precisely position the 6000 shotpoints with relation to the geophones. Data was recorded simultaneously on Schlumberger Tape and also 9-track UKOOA format.

Three-dimensional sonar by Bentech Subsea

A SEABED survey sonar simultaneously performing topographic mapping and shallow seismics at water depths of more than 6 km has been developed by Bentech Subsea of Stjørdal, Norway.

A unique feature of the new sonar is electronic beam steering, providing unmatched range and image sharpness.

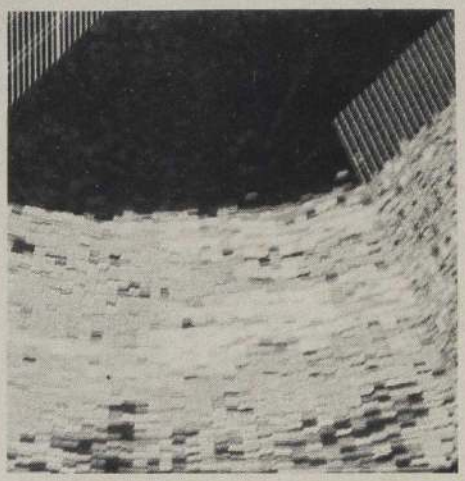
The system, called Topas for Topographic Parametric Sonar, is suited for such applications as pipeline pre-lay and post-lay surveying, charting of trenches and buried cables and pipes, examination of sites for platforms and locations for dredging and rock dumping, deepwater alluvial mining, and for defence purposes.

A pipeline can be mapped from a straight vessel course instead of a zigzag course, which dramatically reduces surveying time and costs.

Based on Bentech's own signal-processing technology, the system uses a hull-mounted or towed scanning transducer as the signal source.

The electronic beam steering allows a very narrow beam to be used, automatically eliminating a wide range of noise signals. The technology has resulted in unmatched resolution and in sub-seabed penetration in excess of 100 metres, more than twice that of any other sonar.

Presentation of a three-dimensional image on a two-dimensional monitor screen is extremely difficult, but the problem has been elegantly solved. Each cross-sectional scan overwrites the previous scan but part of the latter is retained on the righthand side of the screen, producing the three-dimensional display. The scans are scrolled out of the screen, so that the most recent data are displayed. Details are enhanced by colour coding.



An example of the Bentech Topas system

According to Bentech Subsea, the system is easily integrated with units for signal logging, data storage and post-processing and is capable of meeting any foreseeable future surveying requirements.

Samples success for Oilphase

A NEW tool for retrieving samples under pressure from oilwells has been successfully launched by an Aberdeen company.

The introduction of the Single-phase Reservoir Sampler (SRS) marks a breakthrough for Oilphase Sampling Services Ltd, who started operations less than two months ago after six months of tool development and testing.

Amerada Hess, BP and Mobil have already used the tool and others are showing interest in it for their North Sea operations.

Using a unique pressure compensating system, the SRS can retrieve reservoir samples without gas breakout. The sample can be rapidly transferred into shipping bottles and maintained in this monophasic condition to the hydrocarbon laboratory for analysis.

BOET awarded subsea contract by Marathon

BRITISH Offshore Engineering Technology Limited (BOET) has been awarded a contract by Marathon Oil UK Ltd, on behalf of the Brae Group. The contract is for the front end engineering design of a Subsea Separation Unit (SSU) as one potential option for the West Brae development on Block 16/7a in the UK sector of the North Sea.

This award follows on from BOET's extended trials to prove the concept of subsea separation on Hamilton Brothers Argyll field.

The proposed conceptual scheme will use a single stage subsea separator located near the wellheads with liquids being pumped back to the Brae 'A' platform some 10km distant. Separated gas will flow to Brae 'A' under the operating pressure of the SSU via a separate line.

Rotortech win contract

ROTORTECH Limited, precision helicopter engineers and manufacturers of specialist airborne equipment, have won a major contract from oil company, Unocal, for the supply of a helicopter deployed dispersal unit.

Rotortech are to supply Unocal of Thailand with the purpose built TC3 pollution control device which is underslung by helicopter and utilised for rapid deployment in an emergency situation as a weapon against offshore oil pollution.

"Substantial benefits lay in helicopter deployment of dispersal, it is faster, has greater manoeuvrability and effect than any conventional method – in three minutes it can spray more than a boat can in one hour," said Geoff Wilcox, Rotortech's Product Manager.

The unit is underslung and independently powered, holds up to 200 gallons of dispersant capable of operation for up to one hour. Aerodynamically designed, the unit is extremely stable in flight offering minimal reduction in air speed and no effects on manoeuvrability.

View stripes

Striped Bottles

High-density polyethylene bottles featuring translucent 'view stripes' for easy visual inspection of contents levels are now available from Plysu Containers Ltd of Woburn Sands, Bucks.

Ideal for packaging motor oils, automotive and horticultural products, these include '5LX' 5-litre containers with an integral carrying handle and a space for product branding.

500 ml and 1-litre cylindrical bottles are also available with view stripes. Like the 5LX, they can be supplied blow moulded in a wide range of pigments and can be screen printed with customers' own single or multi colour designs.

. . . people

Texaco Inc have designated **Mr Peter Bijur** to assume the position of President of its Texaco Europe Division upon the retirement of **Mr Paul Hicks** on 1 November 1990. Mr Bijur will continue to serve as Chairman of London based Texaco Ltd. Other appointments at Texaco include **Mr William Tierney** as Managing Director, Manufacturing and Marketing and **Mr Stewart Cusden** as Manager, Lubricants Division.

Mr Robert L Potter has been named Western Region Manager for FMC Petroleum Equipment Group. He will now be responsible for operations in Houston, Venezuela, Canada and Argentina.

Mr Anthony G Reid, above, has been elected President and Managing Director, Continental Netherlands Oil Company. Based in Leidschendam, Mr Reid is responsible for Conoco's exploration and production activities in the Netherlands. Formerly General Manager, North Europe, West Africa and Egypt, Conoco Inc, Houston, he succeeds **Mr John Lung** who has retired after 39 years with the company.

Mr Mike Thiele has been named a Senior Vice President of Bechtel Corporation. Mr Thiele will continue as Manager of Bechtel Petroleum, Chemical and Industrial's Pipeline, Pulp and Paper business line based in Houston, USA.

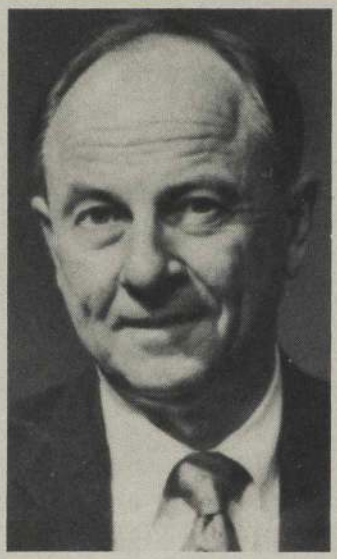
Mr Jim Rumley, who retired from BP last December after 34 years in oil and gas engineering has joined the Steel Construction Institute project team engaged on Blast and Fire Engineering in Topside Structures.

Mr Bruce Rees, above, has recently joined DNV Quality Assurance Limited as General Manager, replacing **Mr Allan Collins** who has moved to SGS Inspection Services Limited.

Petrolite Corporation have announced the formation of its Technology Department which will combine the company's safety, health and environmental affairs, research, development and technical service, and quality departments. **Mr Ralph J Churchill** will head the department.

Mr Andrew Smith has been appointed General Manager at Foxboro (GB) Limited. He will be responsible for sales and engineering services, reporting to the Corporate Vice President, International Operations.

The expanding fuel systems supplier, FP&T Installations of Banbury, have appointed **Mr Steve Preston**, below, as the Manager of their new Northern Service Centre in Accrington.



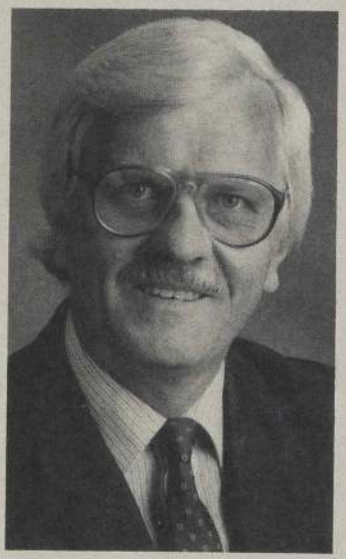
Mr Robert E Lee, above, has been named Sales Manager of seismic products to Western Atlas Manufacturing, a division of Western Atlas International Inc.

Edacom Data Systems have appointed **Mr Norman Sherer** as Customer Service Manager. On a day to day basis he will control and manage an expanding team of Customer Service Engineers, whilst also having responsibility for product support and work control within the Customer Service Group.

Micrelec Group Plc, the petrol automation systems and services company, have announced the appointment of **Mr Michael Field**, to the Board of Directors as Group Finance Director.

Sysdrill Limited an Aberdeen based company have announced the appointment of **Mr Nigel C Ross**, below, as Marketing Manager with worldwide responsibility for sales and marketing of the companies drilling software products.

Arthur D Little, the international management consulting group, has opened an office in Anchorage, Alaska. The office will support the firm's environmental, health, and safety consulting practice clients that are based in or have facilities in Alaska. The majority of the consulting work in Anchorage will focus initially on marine environmental assessment — Arthur D Little's Marine Sciences Unit has begun its second year as Exxon's prime contractor to monitor the chemical fate and long-term effects of the Exxon Valdez oil spill. The new office will be headed by **Mr Stephen D Pace**, a senior consultant with the firm's Marine Sciences Unit.



TCFW Consultants have recently appointed **Mr John Fraser**, above, to the position of Director of Training Services. Mr Fraser, formerly TFCW's Senior Management Consultant, has extensive experience in client consultancy and in developing a wide range of technical, safety, management and emergency response courses. He is also responsible for the preparation and production of associated training manuals and documentation to support all aspects of offshore operations.

The United Kingdom Offshore and Operators Association, which represents all the 36 companies operating in North Sea licences, has appointed **Mr Gordon Debnam** as its Director of Operations. Mr Debnam has spent his whole career in the oil and gas industry. His most recent appointment was as the Aberdeen based North Sea Production Manager for Britoil.

Mr Steven Leigh has been appointed Sales and Marketing Director of Metrotect Limited.

Basil Butler, (left), IP President, and Sir Archibald Forster, (right), past IP President, with Derek Payne, on the occasion of his retirement from the Institute at the end of June.

Around the Branches

Essex

10 October: 'Environmental Legislation in the Oil Industry — Current and Future' by P Sloan, Assistant Director of United Kingdom Petroleum Industry Association.

Irish

11 September: Golf Outing, Little Island Golf Club (Cork).

19 September: Seminar on 'Vapour Recovery — the technicalities, cost and legislation', Dublin.

Shetland

11 September: Ladies evening: Bobby Tulloch talks on 'Birds seen on offshore oil installations'. Buffet, Maryfield, Bressay. 7pm ferry.

9 October: 'Attitude of Banks to Financing Oil Supplies and Services in far-flung places'. Tom Borthwick, Bank of Scotland, Shetland Hotel, Lerwick.

Northern

13 September: Gold Day, Dunham Forest, Altrincham.

16 October: 'Electrical Oils' — A video by Carless Refining and Marketing.

New Collective Members

BfB Société Anonyme is an oil consultancy, based in Nameche, Belgium, specialising in lubricant development and possessing a modern and well-equipped laboratory. It is able to perform all tests on lubricants, following IP, ASTM, AFNOR, DIN, CNOMO etc specifications and methods.

BfB's facilities include physico-chemical analysis, as well as mechanical testing methods for lubricants, greases and fuels.

Repsol (UK) Ltd (formerly Carless Petroleum and Carless Refining and Marketing, purchased from Kelt Energy in 1989) forms part of Repsol SA, Spain's largest industrial company.

Repsol intends to build a UK marketing operation, based on these two already established UK companies, which refine and market nearly 1m tonnes of petroleum products per annum in the United Kingdom and, on the Speciality side of CRM, into North West Europe.

The new company compliments two existing structures: Repsol Quimica, which has been trading a range of Polymers and intermediate chemical products in the United Kingdom since 1987.

Repsol Exploration (UK) Limited (formerly Hispanoil), which obtained its first Licence in the 5th Round in 1976 and has been awarded Blocks in all succeeding Rounds. Repsol currently participates in 19 Blocks, producing about 8,000 BOPD from participation in the Magnus and Forties Fields, and owns 25 percent of the Forth Field, in evaluation phase, and 20 percent in Block 21/27.

Mediterranean Oilfield Services Co Ltd, (MEDSERV), Malta, operates a supply and services customs-controlled (Free Port) base in one of Malta's best sheltered harbours. Its deep water quay, together with bulk plant facilities, engineering work, heavy equipment, offices, open and closed storage space and other amenities make it a complete, compact base.

The company acts as a contractor in providing a variety of manpower and catering services. Amongst others, it acts as an agent in shipping, freight clearing and ship chandlery. MEDSERV is actively working on various projects such as slop recovery, oil pollution control, the setting up of a Mediterranean College for Petroleum Studies, and two exhibitions 'Clean Seas 91' and 'MOEX 92' (The Mediterranean Oil Exhibition).

Bowman Riley Partnership was established in Skipton, North Yorkshire, some 21 years ago. Its present team of 35 comprise professionally qualified and experienced technical and administrative staff fully competent in dealing with every aspect of building design and construction from inception to final account.

The partnership have been closely connected with the design and construction of petrol filling stations throughout the United Kingdom for the past eight or nine years. Now supported by computer aided drafting and design systems, their team are well able to undertake a varied workload and are enjoying steady growth throughout industry.

New Members

Anderson, J, Old Schoolhouse, Collafirth, Near Voe, Shetland Islands ZE 9PZ

Andrews, L, Ashe Farm, Thornfalcon, Taunton, Somerset TA3 5NW

Battie, MJ, Inspectorate Watson Gray, Harrisons Wharf, London Road, Purfleet, Essex RM16 1PT

Bonello, MJ, Seabreeze, Wignacourt Street, Upper Xemxija Hill, St Paul's Bay, Malta

Bulkin, BJ, BP International Ltd, BP Research, Chertsey Road, Sunbury-on-Thames TW16 7LN

Burton, CC, Archaeus Ltd, Queens Building, Kidderpore Avenue, Hampstead, London NW3 7ST

Calladine, J, 6 Lycroft Close, Goring-on-Thames, Reading, Berkshire RG8 0AT

Cassar, CM, 25 Sunny Spot, Xemxija Hill, St Pauls Bay, Malta

Catto, JH, Villa Olicana, Stronka Fort Road, Madliena, Malta

Clifton, MJ, Viscometers (UK) Ltd, Shearing House, 2 James Watt Close, Daventry, Northants NN11 5RJ

Daud, D, 108 Lengkong Tiga, Apt 04-297, Singapore 1441, Republic of Singapore

Davey, BJ, 9 Vista Vird, Brae, Shetland E2 9SL

Duvall, SW, 18 West Park, Inverbervie, Montrose, Angus DD10 0TT

Elbrow, GK, Technorizon Int Plc, 58 Angel Hill, Sutton, Surrey SM1 3EW

El-Hariry, AA, Kuwait National Petroleum Co, PO Box 70, Safat, Kuwait 13001
Findlay, JW, TR Little & Co, 41 North John Street, Liverpool L2 6RX
Ford, F, 3 Weaver Road, Whitby, Ellesmere Port, South Wirral, Cheshire L65 9DE
Haraldsen, OS, Ministry of Petroleum & Energy, PO Box 8148, WEP 0033, Oslo 1
Henderson, DC, 48 Leahurst Court, London Road, Brighton, Sussex BN1 6UN
Kulkarni, V, SGS India Private Ltd, SGS House, Naorogi Furdoomji Road, Colaba, Bombay, India 400039
Lam, KF, Room 824, Block 4, Wong Club, Hang Col, Hong Kong
Lodge, CD, IBM UK Ltd, 414 Chiswick High Road, London W4 5TP
Machunga-Disu, LT, NAPIMS, NNPC, Industrial Bank House, Plot 1637, Abemola Abejo Kumbo St, Victoria Island, Lagos Nigeria
Mifsud, A, Villa JP, Garra Street, Victoria Gardens, Tal-Ibragg, Malta
Moffay, LM, 25 Hayfield Terrace, Denny, Stirlingshire FK6 5LA
Moss, JD, Sun Maid, 5 Freres Street, Sliema, Malta
Moyers, TL, Cameron Iron Works Ltd, 53 Grosvenor Street, London W1X 9FH
Naja, CE, Kelly Down House, 60 Point Street, Sliema, Malta
O'Connor, B, Newick House, Newick Lane, Heathfield, East Sussex TN21 8PY
Odell, RW, Rangi Marie, Woodhouse, Belton, Doncaster DN9 1QQ
Pavey, DJ, Fina Plc, Fina House, Ashley Avenue, Epsom, Surrey KT18 5AD
Robinson, M, 70 Glenavon Road, London E15 4DD
Robinson, SC, 46 Overcliffe Road, Grays, Essex RM17 6AJ
Russell, PJ, 21 Holmside Road, London SW12 8RJ
Ryan, M, Eolas, Glasnevin, Dulin 9, Eire
Sanyal, D, British Petroleum, BP Middle East Ltd, PO Box 1699, Dubai, UAE
Scerri Montaldo, L, Monsa Enterprises Ltd, 1 Tower Road Lane, Sliema, Malta
Simpson, AJ, Brow Lane House, Brow Lane, Heswall, Wirral L60 0DT
Stepin, MA, 4 Petroleum Depot RAOC, Petroleum Inspectorate, BFPO 17
Syed Bahaldin Aljumlud, SA, 7061 Jalan Berlian, Taman Setia, Gombak, Selangor, Malaysia 53100
Tsang, HK, 94 Pan Hoi Street 4/F, Quarry Bay, Hong Kong
Uchida, C, Hikawa Shoji Kaisha Ltd, London Liaison Office, 7 Albemarle Street, London W1X 3HF
Vasey, GM, 52 Southlands, Chineham, Basingstoke, Hants
Veryard, RW, 9 Woodside Way, Redhill, Surrey RH1 4DB
Williams, M, Chequers, New Street, Off Triq Il-Keffa, Swieqi, Malta
Woodward, AP, Arthur Andersen & Co, 1 Surrey Street, London WC2R 2PS
Macdonald, AJ, 4 South Ythsie Cottages, Tarves, Aberdeenshire AB4 0LS

THE EUROPEAN AUTO DIESEL CHALLENGE

Proceedings of a conference held on 4 April 1990

How are European auto diesel specifications developed to cope with increasingly stringent environmental legislation?

What is the outlook for auto diesel demand, particularly in view of the potential 1992 fiscal changes?

What about the impact of the whiter European barrel on supplies of auto diesel fuel to meet stricter quality specifications? Can we meet the demand ourselves or must we import from Russia?

How do the manufacturers of diesel engines for cars and heavy goods vehicles view the new requirements, and can they economically modify their engines to suit?

Where do additives fit into this picture?

These and other relevant questions were covered at the conference and are included in the proceedings. Papers have been contributed by major European diesel engine manufacturers, government departments and major oil company representatives.

Price: UK £25.00 Overseas £30.00

Please send remittance with order.

This publication is available from the Library, The Institute of Petroleum.

Deliveries into Consumption

UK deliveries into inland consumption of major petroleum products —Tonnes

Products	*May 1989†*	*May 1990**	*Jan–May 1989†*	*Jan–May 1990**	*% change*
Naphtha/LDF	196,420	172,490	1,362,010	1,278,660	−6.1
ATF—Kerosine	572,760	591,040	2,437,690	2,587,720	6.2
Motor Spirit	2,087,120	2,147,040	9,721,370	10,066,230	3.5
of which unleaded	381,300	709,660	1,045,382	2,700,820	158.4
Super unleaded	n/a	80,960	n/a	346,150	
Premium unleaded	n/a	628,700	n/a	2,354,670	
Burning Oil	106,560	112,270	905,480	936,050	3.4
Derv Fuel	852,710	913,200	4,097,130	4,398,990	7.4
Gas/Diesel Oil	641,880	586,490	3,783,010	3,599,500	−4.9
Fuel Oil	773,150	1,079,650	4,396,490	5,500,070	25.1
Lubricating Oil	77,130	75,340	366,590	347,400	−5.2
Other Products	510,160	525,050	2,703,610	2,848,050	5.3
Total above	5,817,890	6,202,570	29,773,380	31,339,310	5.3
Refinery Consumption	469,780	505,250	2,414,000	2,474,960	2.5
Total all products	6,287,670	6,707,820	32,187,380	33,814,270	5.1

†Revised *Preliminary n/a not available

CONFERENCES AND COURSES 1990

September 27, 28	Oil Industry Nurses Symposium
October 9	Information Support for the Energy Industries — An Evaluative Approach
October 18	Occupational Hygiene Conference on Oil Mists
November 6	Safe Road Transport in the Petroleum Industry — The Way Ahead
November 16	Futures and Forward Markets — Swaps and Options — Which Way Forward?
November 22	Offshore Safety — The Way Ahead
November 27	Luncheon At Grosvenor House, London Speaker: Mr Robert Horton, Chairman, British Petroleum Co. p.l.c.
December 4	Crude and Petroleum Product Shipments: Problems encountered during Independent Inspection

For further information, please contact:

Caroline Little
The Institute of Petroleum
61 New Cavendish Street
London W1M 8AR, UK
Telephone: 071-636 1004 Telex: 264380
Fax: 071-255 1472

1991 IP Diary

Orders are now being taken for the 1991 IP Diary. The leather covered diary has the IP crest (as above) reproduced at the top with the date and gives ample space for a company logo to be embossed underneath. The diary will be available in late Autumn.

The colour of the cover will be blue.

The diary contains 32 pages of specially printed copy, including oil industry statistics collected by the Institute of Petroleum.

The cost for a single diary is £6.00 (incl. p&p and VAT) and £7.50 overseas.

Discounts are available for bulk orders on application. Embossing of company logos is available at extra charge. Enquiries and orders should be made to:

Susan Ashton,
Institute of Petroleum,
61 New Cavendish Street,
London W1M 8AR
Telephone: 071 636 1004
Fax: 071 255 1472
Telex: 264380

Please reserve for me ..... copies of the 1991 IP Diary

I enclose my cheque for £..... made payable to **The Institute of Petroleum**

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.....

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