MAY 1991

The Institute of Petroleum

PETROLEUM REVIEW

Eastern Europe

Problems and prospects in a new oil market are outlined by Dietrich Schultz

Qatar gas

The first phase of the development of the huge North Field is coming on stream

North Sea

The opportunity offered by the UK Continental Shelf by David Harding of BP Exploration Europe

Lubricants

An interview with Nick Wellman of Elf Oil

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Cover photograph of testing facilities at Solaize laboratory, near Lyon. Photograph courtesy of Elf Aquitaine.

. . . news in brief

10 March

Iran announced plans to drill an exploration well in the North Field which it shares with Qatar.

13 March

Marubeni Corporation and Neste Oy plan a joint feasibility study of the construction of a new refinery at Rostock.

US oil company Arco has made a gas discovery in the southern North Sea block 43/24 close to the Esmond to Bacton pipeline.

Work has started on the construction of Indonesia's first olefin plant in Cilegon to produce ethylene, propylene, benzene and other basic materials for plastics and synthetic fibres.

14 March

Texaco is to build a £37m upgrading plant at its Pembroke refinery in Wales.

Exxon Corporation have agreed to pay $1 billion to settle all civil claims and criminal charges arising from the *Exxon Valdez* oil spill.

15 March

US imports of crude oil and petroleum products were 15.9 percent lower in February 1991 than in the corresponding period a year earlier.

Mitsubishi Oil is considering commercial production from a 7000 bpd onshore oilfield—PDL2 in central Papua New Guinea.

16 March

British Gas has been awarded a 50 percent stake in block 5/27 in the Gulf of Thailand where it plans to drill at least one exploration well before August 1992.

18 March

Petroleos de Venezuela is planning to build up to 22 new vessels spanning diverse ship types over the next five years as part of a strategy to take responsibility for shipping half the crude and products exports from Venezuela.

Mobil North Sea has agreed a second exchange deal with British Gas for additional quantities of gas to be used by Mobil Gas Marketing (UK) for sale into Britain's industrial market during 1991/92.

20 March

Monument Oil and Gas is buying all the oil and gas interests of the Mercurius Group held through SECAB — an exploration firm managed from Sweden.

Daily oil production from the UK sector of the North Sea during February was just over 1.9 million barrels per day — the highest output achieved since May 1990 and 15 percent more than in January.

Shell announced an oil discovery in the UK central North Sea exploration well 21/20b-4 tested light oil at stabilised rates of 6600 bpd with 7.6 MMcfd of gas.

22 March

Iran plans to raise its oil production capacity to 5m barrels a day by March 1993.

The Shell group of companies in Malaysia is planning to invest another $3.3 million in upstream and downstream activities in the country over the next five years.

The development of the Troll field was launched with the award of two major construction contracts worth NKr4.15 bn for a concrete platform.

23 March

Occidental Petroleum (Caledonia) is sending a rig to begin drilling off the south coast of the Isle of Wight.

A UK national drive to recruit more inspectors for offshore oil and gas installations has been launched by the Health and Safety Executive.

Davy Corporation intends to pull out of its problematic offshore engagements and has reached a settlement with Esso over a £100 million contract at Fawley refinery.

Western Australian Petroleum has brought the Yammaderry oilfield on stream — the first of two new developments in the Thevenard Island area.

London firms Kirkland Resources and Nimex have linked up with Philippines based Petrofields and Oriental for a $6 million exploration well on the Penatagan prospect of the Island of Mindoro, central Philippines.

25 March

Sir Leon Brittan, European Community commissioner for competition policy, is threatening legal action against 10 governments over their monopoly laws on who can import and export supplies of electricity and gas.

28 March

UK Energy Secretary John Wakeham confirmed that responsibility for offshore safety would be transferred to the Health and Safety Executive from 1 April.

29 March

Goal Petroleum has announced pre-tax profits of £10.58 million for last year, more than double the group's 1989 profits.

French state-controlled oil group Total has won its $134 million bid for a 50 percent stake in Argentina's El Huemel oilfield.

2 April

Wood Group Engineering Contractors have taken over AHT Inspection for an undisclosed sum. AHT is the largest oil industry-related inspection company in East Anglia.

Calor Group has said that it plans to invest up to £17 million in a joint venture to market and distribute liquefied petroleum gas in Poland, Hungary and Czechoslovakia.

Pertamina has awarded seven oil and gas exploration and production contracts to companies in Indonesia, the United Kingdom, The Netherlands, Japan and the United States.

3 April

Command Petroleum, an Australian oil group, have made a significant find on the southern slopes of the Highlands area of Papua New Guinea, north west of Port Moresby.

Total has taken a 25 percent stake in Compagnie Europeene des Petroles (CEP), a small French exploration and production company.

4 April

The rise in sales of unleaded petrol in the United Kingdom now appears to have stagnated — the market share for lead free petrol has stayed around 38 percent since November last year.

Oil and gas exploration drilling in the United Kingdom sector of the North Sea doubled in the first quarter of this year with companies completing 45 wells.

Chevron UK is selling a number of 'non-core' interests in the southern North Sea — its 50 percent stakes in blocks 50/26a, 48/7a and 49/14a and its 25 percent interest in 48/9a to Arco British.

5 April

Refiner, Singapore Petroleum Corporation, is speeding up the development of the first phase of its Sing $100m oil terminal in the offshore island of Sebarok because of the strong demand for oil storage capacity.

Caspen Oil has purchased the entire issued share capital of Ghiselli Energy Corporation (GEC) for an initial consideration of 750,000 new Caspen shares.

Saudi Arabia and Iran are to maintain the volume of oil stored at sea at present record levels, giving support to the spot tanker market.

Oil and gas reserves in the BP operated Forth field in the UK North Sea have been upgraded by more than 50 percent after appraisal drilling.

Chevron is to close its Alaskan refinery at Nikiski because of marginal profitability and the cost of complying with new US oil spill legislation.

6 April

Soviet oil production is expected to decline by another 6 percent to less than 11 million barrels per day, according to the International Energy Agency.

Conoco has concluded a multimillion dollar deal for offshore standby safety vessels to work on a long-term contract in the southern North Sea.

The world's oil needs should increase 0.5 percent this year to 65.9 million barrels a day after stagnating in 1990, with most of the new demand coming from Western Europe and the developing Asian countries, according to the International Energy Agency.

8 April

Work has begun on the North Sea's largest pipeline project — Zeepipe which is due to start carrying gas from Norway's Sleipner East field to the Zebrugge terminal in 1993.

10 April

British Gas has made an onshore oil find in Tunisia, the second on territory that came with the acquisition of Tenneco's oil and gas operations outside North America.

London's International Petroleum Exchange has launched a futures contract based on naphtha.

Elf Aquitaine has made a significant gas/condensate discovery close to Ultramar's Franklin prospect.

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Offshore safety move by HSE

Responsibility for offshore oil safety was transferred on April 1 from the Department of Energy to the Health and Safety Commission with Aberdeen named as the operations headquarters.

It was no surprise to the industry that Aberdeen did not get the entire new Offshore Safety Division despite the vigorous campaign that was waged by the Offshore Safety Partnership.

The partnership involving the City Council, the Chamber of Commerce, Grampian Enterprise Ltd and Grampian Regional Council sought to get the division located in Aberdeen but that was seen as unrealistic as it would have meant moving senior personnel from Bootle and London.

The news of the revamped and reshaped Safety Division was broken in Aberdeen however by Tony Barrell, its chief executive, who said the numbers of inspectors and back-up staff in the city would be increased from 14 to 100 — and 70 of those will be inspectors.

Tony Barrell also told the news conference that the Executive would be moving into big new offices in Aberdeen. He was gratified that funding for offshore safety would rise from £13 million in 1991 to £35 million over a four-year period.

'The main centre of operations will be in Aberdeen', said Mr Barrell: 'We are negotiating for accommodation and should be moving in by the end of October.

'There will be 100 staff in Aberdeen and overall the HSE expects to employ 400 throughout the country.'

However Mr Barrell admitted that staff recruitment would be a big problem as they are having to compete with the oil companies who are also seeking petroleum specialists.

'We will respond to the challenge of the job which is something quite new in terms of offshore safety and we're going to be tough.'

Joint research

BP Exploration and Statoil have announced a joint research and development programme in support of their international exploration and production activities. This is the second of three agreements between the two companies initially announced in August 1990. A first agreement covered joint exploration and development activities in West Africa, the Soviet Union and offshore China and Vietnam. Discussions are continuing in the third area covering joint marketing of gas in the United Kingdom and North Sea gas infrastructure development.

Joint venture

BP has announced plans for a joint exploration venture in Venezuela with the country's state-owned company Petroleos de Venezuela (PDVSA). The companies will also set up a joint study team to examine the costs of refining Venezuelan extra heavy crude.

Name change

Carless Petroleum Limited will change its name to Repsol Petroleum Limited with effect from 1 April.

Carless was founded in 1859 and widely credited with first registering the name 'petrol' as a brand name.

Edacom's Soviet Union first

Nokia Edacom has recently completed the installation of the first EFTPOS system in the entire Soviet Union. EDACOM AZS systems have been installed in Soviet–built petrol filling stations in Moscow, and in the Estonian capital, Tallin, a total of 15 in all.

Three commercial fleet systems have also been installed in depots of Moscow's main transport company, Glavmosavtotrans. Some stand alone pilot systems have also been implemented in other Soviet towns.

Usage experience so far is varied, but in Tallin, where all 10 filling stations are automated, there are over 5,000 credit cards in daily use, with a total of 1,000–1,500 card transactions a day being processed. In the largest filling station with 12 pumps, there are up to 500 card transactions a day.

In Moscow the usage of credit cards has been quite low, with only a few daily transactions.

Quick response to Genoa spill

Pollution experts from the Southampton-based Oil Spill Centre responded quickly after being asked to help tackle a 270,000 barrel oil spill off the coast of Italy last month.

Within hours of the spill, caused by the *Haven*, a Cypriot registered supertanker, the centre airlifted a 13 man team and 20 tonnes of equipment by Hercules to the Mediterranean port of Genoa.

A spokesperson said: 'We were asked to help late that Thursday afternoon. By three o'clock Friday morning the team and equipment were in Genoa.'

Since then the team has been using its booms and skimmers to help contain the six mile long slick offshore.

Good weather has helped the clean-up, co-ordinated by Admiral Antonio Alati, Harbourmaster of Genoa. But the disaster was compounded when the *Haven* exploded, caught fire and sank with the bulk of its cargo, 724,000 barrels of oil, still on board.

So far, oil has reached some Italian beaches and light winds are now blowing the slick towards the French coast.

Shetland stakes claim for frontier work

The Shetland Oil Industries Group is stepping up its campaign to win work from oil industry activity to the west and north of the Islands.

The role for Shetland companies was emphasised by the Group during a visit by Energy Minister, Colin Moynihan.

New licences which are due to be awarded soon by the government will open up areas to the west and north for exploration drilling.

Mr John Groat, Vice Chairman of the Shetland Oil Industries Group (SOIG), said: 'We recognise the need to continue to provide the right facilities and services at competitive rates. But we would also very much hope that the Department of Energy in its discussions with the new licensees will encourage them to look to Shetland for support operations.'

The group is also seeking a role for Shetland in the development and production of new fields in the areas to the west and north. Promising discoveries have already been made to the west.

Mr Moynihan was told the group wants development plans to incorporate delivery of oil from new fields to the Sullom Voe terminal.

Alba field contract plans

Operator Chevron UK has announced three Alba Northern platform contracts valued at £35 million.

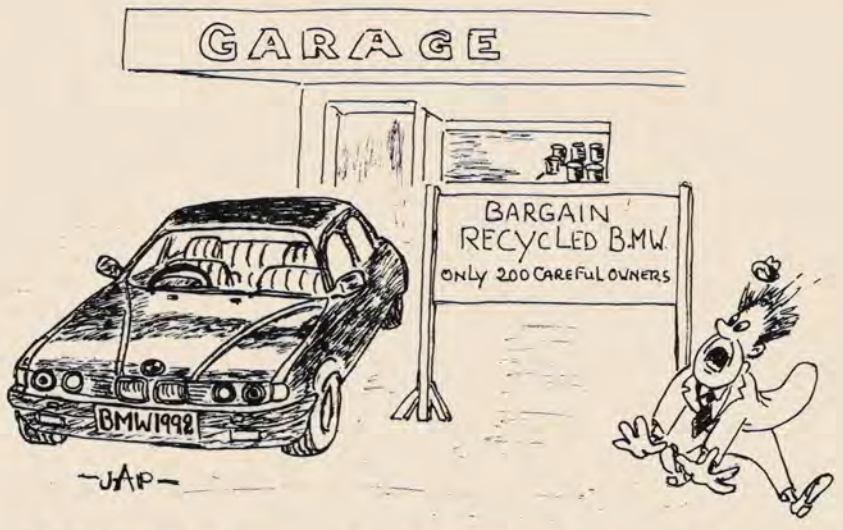
The £30 million platform installation contract has been awarded to Saipem UK Ltd. The template will be installed during this summer so that up to nine production wells can be pre-drilled. The installation of the jacket, piling and topsides will follow in 1993, when production is due to start.

The design and project management for the mooring system of the field's floating storage unit (FSU), to be located some 3 kilometres from the platform, has been awarded to Single Buoy Moorings Inc, which will design the internal turret mooring system of the floating storage system. Mooring lines radiating from the turret will secure the FSU to the sea floor and flexible pipe risers will conduct crude from the subsea pipeline to the FSU through the turret. Construction contracts will be awarded later this year. From the floating storage crude will be taken ashore by tanker.

Lloyds Register of Shipping will provide safety certification services. All three contracts are subject to the approval of the Alba Development Plan by the Department of Energy.

The Alba field, discovered in 1984, is located some 130 miles northeast of Aberdeen. It contains about 1 billion barrels of heavy oil, of which over 300 million barrels are estimated to be recoverable. Peak production levels from Alba Northern are expected to be 60–70,000 barrels a day.

The Alba field contains only a little gas which will be used as fuel. However, underlying Alba is the large Kilda gas/condensate discovery which is still being appraised and will be developed separately at a later date—this involves different companies and different blocks.



BMW is going 'green' by preparing plans to recycle its own cars in a bid to tackle the problems caused by the 2 million cars scrapped each year in Germany. The company already has a pilot scheme at Landshut, near Munich, which, apart from imaginatively reusing 75 percent of disassembled parts and plastics, also reconditions 16,000 engines, 8,000 rear axles and 13,000 starter motors a year.

Licence appeal withdrawn

The Morrison's supermarket chain has withdrawn an appeal against an 'Improvement Notice' to install a closed circuit television system at its Queensway petrol station, Morley near Leeds.

A Senior West Yorkshire Fire Service Officer said it was the first time they had been forced to take such a case so far.

An industrial tribunal in Leeds was told on 28 February, 1991, that the Petroleum Officer had first advised the architect designing the filling station to install closed circuit television in September, 1989.

The forecourt layout meant attendants at the control point did not always have a clear view of the pumps, which is a breach of the conditions of their Petroleum Licence.

Bolivian Sun

The Sun Company has announced a joint venture with Texaco to explore for hydrocarbons in the Andean foothills of Bolivia.

The 30 year agreement provides for hydrocarbons exploration in the 997,500 hectare Azero Block in the foothills of the Andes. The block is close to other hydrocarbon areas that are already in production.

Isle of Wight

Occidental Petroleum (Caledonia) Ltd has confirmed that the jack-up drilling rig Penrod 85 is to be towed to a location 2 kilometres off the south coast of the Isle of Wight to drill an oil exploration well. The estimated duration of the well is 10 weeks, after which the rig will be towed away.

Well 98/13–1 will be drilled to examine a rock structure about 7,500 feet below the seabed.

First approval

Kinetica, the joint Conoco and Powergen gas venture, has awarded a £4.5 million pipeline steel supply contract to British Steel after being granted the first UK government approval for an independently-owned large gas pipeline for third-party use.

The 51-km twenty-inch diameter pipeline will link Conoco's Theddlethorpe terminal with Powergen's new 900 MW combined cycle gas turbine power station at Killingholme, South Humberside.

Nova Scotia find

LASMO have announced that they have successfully drilled an exploration well off the coast of Nova Scotia. The well, Balmoral M–32, was drilled to a total depth of 2,525 metres and tested three hydrocarbon zones in sands equivalent to reservoir intervals in the nearby Cohasset field. The cumulative production rate from the three zones was 9,495 barrels of oil per day with minimal gas and water.

Gas strike

Elf have discovered a gas condensate accumulation in North Sea block 22/30c, 150 miles east of Aberdeen. The high temperature/high pressure well was drilled to a total depth of 5,731 metres. Production testing gave an initial flow rate of 13 million cubic feet per day of gas and 3,300 barrels of oil a day on a 20/64" choke.

German energy battle heats up

By Maurice Reynard

Ten months after the unification of East and West Germany in July 1990, European oil companies are hardening their positions in the battle for the potentially most lucrative and most accessible of the Eastern bloc's energy markets. The first skirmishes are being fought in the gas sector, but competition in filling stations and electricity supply is hotting up. Although the former East Germany is so far behind the West in energy infrastructure that there are good pickings for all, being first clearly counts.

In gas, the freeing of the former East German market is also having an impact on the West, as dominant Ruhrgas is seeing a challenge to its previous tight control over gas supply. The challenge comes from Wintershall, the energy subsidiary of the chemicals company BASF, which is planning major new pipelines through which it can import gas from Norway, the USSR, and possibly the United Kingdom. The new pipelines could supply industry in the eastern states of Saxony and Thuringia. Further, Wintershall is prepared to allow other gas companies to use its pipelines on a third-party basis — a form of operation to which Ruhrgas remains wholly opposed.

Wintershall is planning two trunklines which, if they go ahead, will become the spine of a distribution system which will give Ruhrgas strong competition in its own territory as well as in eastern Germany. The Midal pipeline, running from the Emden area south to Ludwigshafen, will land gas from the North Sea — probably Norway, but a connection to fields in the UK sector is feasible. The other pipeline, Stegal, will bring in Soviet gas from the German-Czechoslovakian border, intersecting with the Midal line at Kassel. Wintershall has already offered a 50 percent share in the Stegal pipeline to the Soviet gas authority, Gazprom, which has signed a contract to supply 8 billion cubic metres/year through the line.

Wintershall's challenge to Ruhrgas is remarkable for a company which, hitherto, was viewed primarily as a vehicle to provide a secure source of oil and hydrocarbon feedstocks for its parent's chemicals operations. Up to now, it has had no substantial operations in gas. But with its Soviet supply deal and its willingness to allow third-party access, it is already making waves.

New ownership

The former East German state gas utility, Verbundnetgas (VNG), will handle the distribution of gas to consumers in eastern Germany, but this company is being sold to the private sector and its future ownership gives clues to the balance of power in the new gas market. The Treuhandanstalt, the body responsible for easing former East German state organisations into new ownership, has already sold 35 percent of VNG to Ruhrgas and 10 percent to another gas company operating in West Germany, BEB.

The sale has led to some disquiet among other prospective participants in the company, who say that it gives three oil companies — Shell, Exxon and British Petroleum — strong positions in the new market. For Shell and Exxon each indirectly own 14.85 percent of Ruhrgas while BP has 25.58 percent. Further, Shell and Exxon each own 50 percent of BEB.

Of the remaining 55 percent of VNG which is now up for sale, Wintershall is to be offered 15 percent. Local East German authorities will be offered another 15 percent, and an East German gas company, Erdgas Gommern, will be offered 5 percent. This will leave four stakes of 5 percent which the authorities have earmarked for gas suppliers. One stake is being offered to Gazprom, the Soviet gas exporter which is eastern Germany's sole supplier at present. The other three 5 percent stakes are being offered to Norway's Statoil, British Gas and France's Elf Aquitaine. Both Wintershall and Statoil were disappointed that their shares were not larger, it seems.

Visitors to eastern Germany do not have to search hard for the reason behind the enthusiasm of Europe's gas companies for a presence there. The country's appalling pollution, evident as smoke in cities and mining scars on the landscape, is the result of relying on low-grade fuels — mainly lignite, which accounts for 70 percent of primary energy consumption, and poorly-refined oil, which accounts for 13 percent. The gas share of primary energy consumption is, at 9 percent, lower than the European average of 16 percent; the balance is made up of coal 4 percent, nuclear electricity 3 percent and other fuels 1 percent. It is gas which is best-placed to make inroads into the lignite share, suppliers say.

BP's Dresden service station

Rising imports

In the past, increased gas reliance would have been unacceptable to the East German authorities because it would have meant increased imports. Although poorly endowed with energy sources, the country's policy was to maximise energy self-sufficiency, seemingly regardless of the cost. In contrast, West German governments have not been shy of importing energy, placing emphasis instead on free-market policies which allow the country's energy to be sourced from suppliers of lowest cost. As such views move east, imports will rise.

The energy sectors of both East and West show some other interesting paradoxes. Successive East German governments were obsessed with security of supply, yet the country's energy consumption per head is one of the highest worldwide at nearly 8 million tonnes of coal equivalent per year. In West Germany, where governments tend to leave energy supply to the private sector, consumption per head is much lower at 6.2 million tonnes coal equivalent per year — yet industrial productivity per tonne of coal equivalent is nearly twice that of East Germany. And West Germany, despite its free-market policies, has made the running in environmental legislation, while the East's state-controlled system has allowed terrible environmental damage to take place.

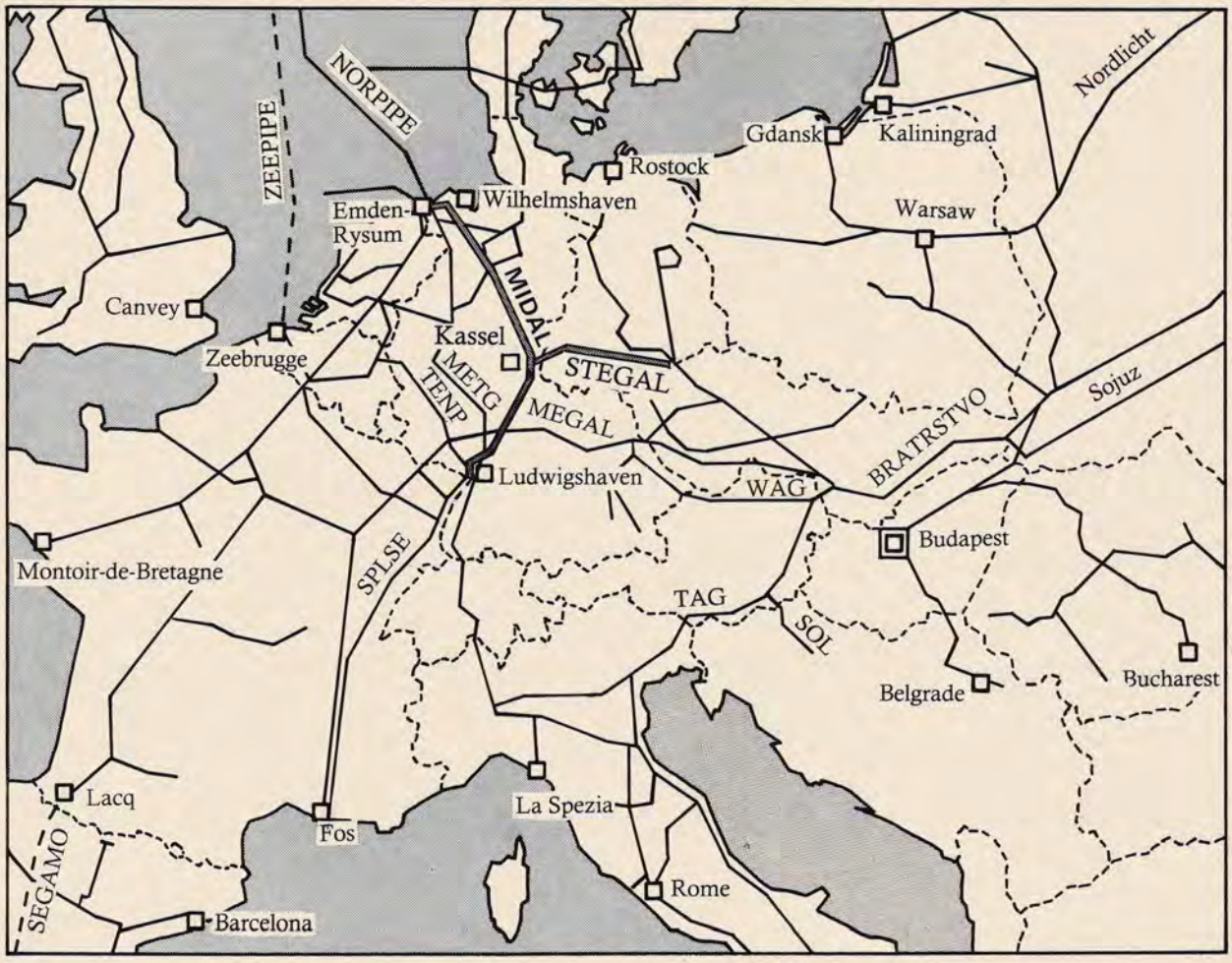
Lignite must take most of the blame for the environmental damage, although the authorities could have made efforts to use it more cleanly. But as well as being polluting, lignite is an inefficient energy source as some 4.3 cubic metres of soil have to be moved to obtain each tonne of lignite. (Each year, it has been calculated, the volume of earth moved in the former East's lignite mines is five times the volume moved to build the Suez Canal, and some 1.6 billion cubic metres of water has to be pumped off annually.) Much energy is therefore expended in extracting and processing the lignite. With some 44 billion tonnes proven, the former East Germany had the world's fifth-largest reserves of lignite, producing about 310 million tonnes annually and generating 85 percent of the former East's electricity from that source.

With inefficiencies in production of lignite being added to by inefficiencies in generation and transmission, the electricity sector is a prime target for modernisation. Again, there are interesting contrasts between former East and West. In the East, lignite-fuelled generating plants run at efficiencies of 22–24 percent while lignite-fuelled plants in the West achieve up to 38 percent. Transmission losses are also higher in the East, at 6.3 percent against the West's 3.8 percent. Nearly half of the generating capacity in the former East is reckoned to need replacing over the coming five years. Further, nuclear is not an easy option as an expert commission has said that the former East's four large nuclear plants at Greifswald, all of the Chernobyl type, have construction defects and should be shut down.

Fortunately, utilities in the West have a sizable surplus of generating capacity, so when facilities to link the two supply grids have been completed this year and next, the problem will be eased. Meanwhile, a West-East consortium of companies is building two large coal-fired power stations (one at Rostock and the other at Luebeck), and other plans are being developed.

Visible changes

Most visible of the changes in the East, however, are in the oil sector. Private-sector filling stations — brighter and more user-friendly than those of the former state organisation, Minol — are already springing up in key locations, and many more will be built when



The European gas pipeline network

companies can acquire the sites for them. (One problem is that local authorities are being slow to release sites for filling stations; another is that title to land in the East can be difficult to establish to the satisfaction of oil company lawyers, and unification has sparked off many disputes over land ownership). But progress is being made: so far, foreign firms have opened 21 filling stations, and another 34 are operated by joint-ventures between Minol and foreign firms. This leaves 1,184 filling stations operated by Minol.

But there is scope for many more. East Germans, accustomed to queue for their gasoline, are fast developing a tase for slick service, when and where they want it. With 3,000 passenger vehicles per filling station in the former East — twice as many as in the former West — it is estimated that some 2,000–2,500 new filling stations will have to be built, and the brand-leaders in the West are pushing hard to make sure that they at least maintain their shares of the enlarged market.

Aral, the West's market leader, is aiming for 500 filling stations in the East, and has signed an agreement with Minol covering the joint operation of around 100 outlets. DEA, the number-two marketer, has also signed a deal with Minol, as has Agip which has plans for 150 filling stations. Elf, aiming for 100–150 filling stations, is working on opening ten per year, Fina is targeting 80–100 and Conoco 130–150.

However, the accolade for opening the first 'greenfield' filling station, designed to full West European standards, in the East went to BP, which constructed an outlet at Dresden in only five months. Amazingly, it is only the third filling station in that city. Evidencing the attraction of the East, BP says it expects its Dresden facility to sell well over 20 million litres annually — or twice the volume sold by the company's best West German outlets.

New markets

Developing markets in the East will, however, lead to some headaches in the supply departments of oil companies in the West, as refinery capacity was already inadequate to meet demand in that part of the country. Rationalisation moves of the past ten years have trimmed western Germany's distillation capacity to 1.6 million barrels per day (mb/d), while product demand stands at some 2.2 mb/d — the difference being covered by imports from the Rotterdam area, carried by barges up the Rhine and by pipeline. This year, the Wilhelmshaven refinery, shut down by Mobil in 1985 and now owned by Beta, will be brought back on stream. Beyond that, however, prospects for an increase in capacity are not encouraging. A recent survey by the industry association, MWV, showed that no major additions are planned for the coming five years.

Refining capacity in the former East stands at 400 000 b/d, with more than 80 percent of the crude supplied from the Soviet Union through the Friendship pipeline. Capacity of the East's four refineries is just sufficient to meet present demand, and MWV expects only small additions to be made over the next five years. Increased product imports into unified Germany therefore seem a certainty. ■

Eastern Europe: a new market for the oil industry

By Dietrich Schultz, Senior Energy Consultant, WEFA Energy

Eastern Europe is a new market in two ways. Firstly it is a largely unknown market and secondly it offers new opportunities. This paper does not intend to exhaust the issue but highlights the main problems, whilst at the same time trying to provide a flavour of the market.

The 'East European' market used to include East Germany and the USSR. East Germany after the unification is a market so completely different from other East European countries that it has been excluded in this article. The Soviet Union, while playing an all important role as a supplier, had to be excluded as a market to make the issue more manageable.

Supply

Supply in Eastern Europe has made the headlines recently for several reasons most of them related directly to the main supplier, the Soviet Union. Firstly, there is the domestic problem of a decline in Soviet production. Then there is the economic issue of the switch to hard currency market prices. Finally the Gulf crisis is playing a role yet again. Iraq has been an important supply source.

Figure 1 shows the indigenous production in Eastern Europe. All countries produce crude oil but in Czechoslovakia, Poland and Bulgaria, the volume is very small. At the other end of the scale is Romania with a sizeable production of 13 million tons/year at its peak. The rest produce a fair share of their crude oil demand but still rely on large imports. The one exception, Albania, that has been self-sufficient up to now, although production is dipping quite sharply and the government is actually negotiating imports from the Soviet Union.

The imports to balance crude oil demand originated mainly from the Soviet Union **(Figure 2).** This has historic reasons — its political dominance in the area. It left Eastern Europe very vulnerable especially the countries with a high share of USSR crude oil like Czechoslovakia, Poland and Bulgaria. The dramatic fall in 1990 underlines this nicely. The 1990 data are partly estimates but I believe the actuals will not change much.

The recent announcement by President Vaclav Havel that Czechoslovakia had secured supplies of 11 million tons in 1991 seem to indicate that imports might not fall further. A continuing decline in USSR crude oil production could still jeopardize these contracts. An interesting factor is that only half of the above volume is covered by a contract with the central government in Moscow, the other half will be supplied by individual republics.

In Czechoslovakia the government has carried out an interesting exercise drawing up a scale of crude oil supply levels and its impact on the economy. The current level of below 13 million tons/year is hurting the chemical industry already and at 11 million tons/year minimum refinery throughput has been reached. A drop to 8–9 million tons/year will require the rationing of gasoline and diesel hurting

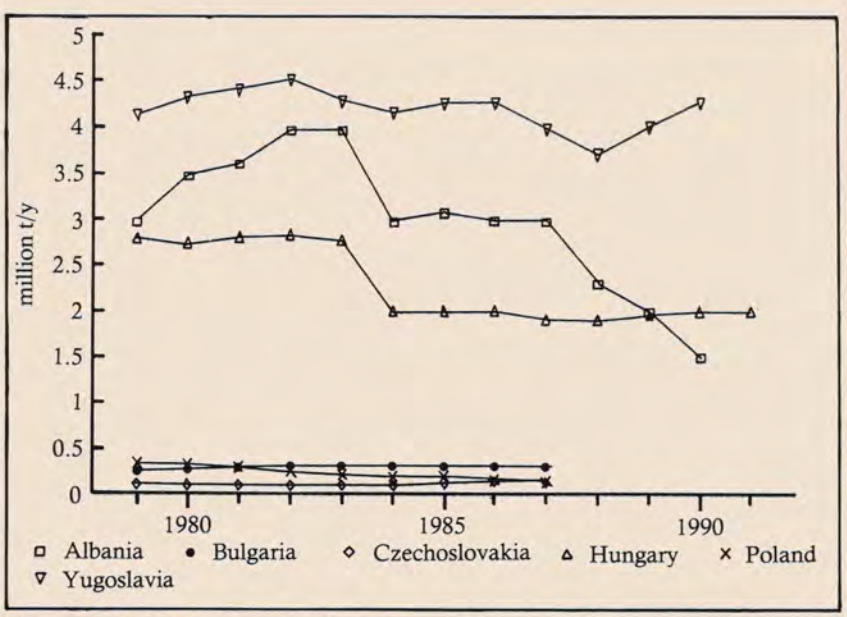


Figure 1: East European indigenous crude production

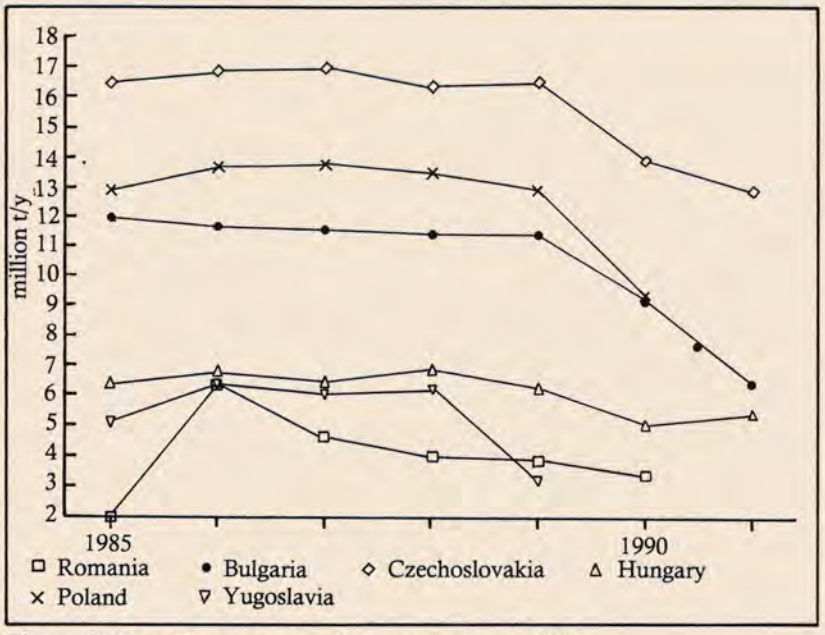


Figure 2: East European crude imports from USSR

the transport, building and agricultural industry. At the level contracted with the USSR central government, ie 5.5 million tons/year, the whole economy will collapse.

Supply cost

From 1 January the USSR is asking world market prices for their crude and payment in hard currency. Prior to this the price was based on a 5-year running average for Arab Light corrected for quality and location. Even more importantly the payment was based on a strong rouble, ie a very favourable exchange rate. This enabled East European countries to buy and refine Soviet crude oil and to sell the products into the western market at a very competitive price and in exchange for hard currency.

East European countries are in no position to pay hard currency for crude imports and contracts so far have mainly been based on barter deals. This causes more problems as the goods traded are in short supply at home. Demand by its own population for better food supplies has forced the Romanian government to stop deliveries to the Soviet Union as part of a barter deal. The Soviet Union stopped deliveries of petroleum products and Romania had to close all retail stations in January. Which again caused protests by the Romanian population.

A further consequence of the new price structure is that inland prices have to go up. Apart from gasoline and diesel, electricity and heating prices are soaring. At the end of last year drivers in Czechoslovakia and Hungary blocked the traffic in the capitals and forced the government to take back the recent price rises for gasoline and diesel. They will not stand a chance in the long-term to escape higher prices. Heating and electricity prices in Romania are increasing by several hundred percent.

The Gulf crisis

The Soviet Union was the main arms supplier to Iraq and received about 11 million tons/year of crude in return. This crude was not shipped to the Soviet Union but delivered to countries like India, Romania, Bulgaria or Yugoslavia instead of Russian crude. The UN embargo stopped that flow causing a 4 million ton shortfall in 1990. While the Soviet Union made up for the loss to India, it did not supply more crude to the East European countries.

Iraq was also trading directly with the East European countries. The Gulf war has meant that these countries not only have lost valuable income in hard currency or crude but that they are left with an estimated $5 billion of bad debts at a time when they desperately need hard currency.

New supply routes

The replacement of USSR supplies is not so much a question of alternative sources. There are plenty of suppliers around at market prices even on a barter basis. Saudi Arabia this year for the first time is negotiating supply contracts with East European countries. The problem is more often one of alternative supply routes. Much of the infrastructure is built around the two crude pipelines from the Soviet Union with 45 million tons/year capacity each. A glance at the map shows that there is very little coast line, none for some countries, to switch from pipeline supply to seaborne supply.

Some new routes are already emerging, however. In the north, Poland has a pipeline that links the port of Gdansk with the pipeline from the Soviet Union and is planning to build a second line. This allows imports through the Baltic Sea to be fed into the existing pipeline system albeit only upstream from Plock.

Czechoslovakia has a link to the Mediterranean via the Adria pipeline from Yugoslavia. The capacity is only 5 million tons/year and some experts expect it to be even lower. Slovnaft, the biggest refinery, is very close to the Austrian border and not far from Austria's own refinery at Schwechat. A pipeline link between both refineries would link Czechoslovakia to the TAL pipeline with plenty of spare capacity.

Hungary also benefits from the Adria pipeline. There is also the possibility to use the Danube as a major supply route. On its way from Austria to the Black Sea the Danube at some stage touches most of the East European countries. Romania, where the Danube joins the Black Sea, hopes to play a key role in the supply of Eastern Europe.

Consumption

Consumption in the centrally planned economies was a matter of political priorities which were to foster industry. As a result yield patterns in Eastern Europe are geared to fuel oil for industrial plants and power stations and naphtha for the petrochemical industry. Gasoline and gas oil yields above the average are a sign of attempts to create hard currency earnings from product export rather than high domestic demand.

Figure 3 compares East European consumption patterns with the UK pattern and that of OECD Europe. A comparison with the United Kingdom's very high gasoline share might not be fair but OECD Europe includes a number of countries with high fuel oil demand like Italy and Spain. The gap to make up 100 percent is mainly naphtha but not always. Albania, because of its heavy crude, produces a large share of bitumen for the export market.

The above pattern is not likely to change quickly. Consumption of gasoline and diesel will not increase till

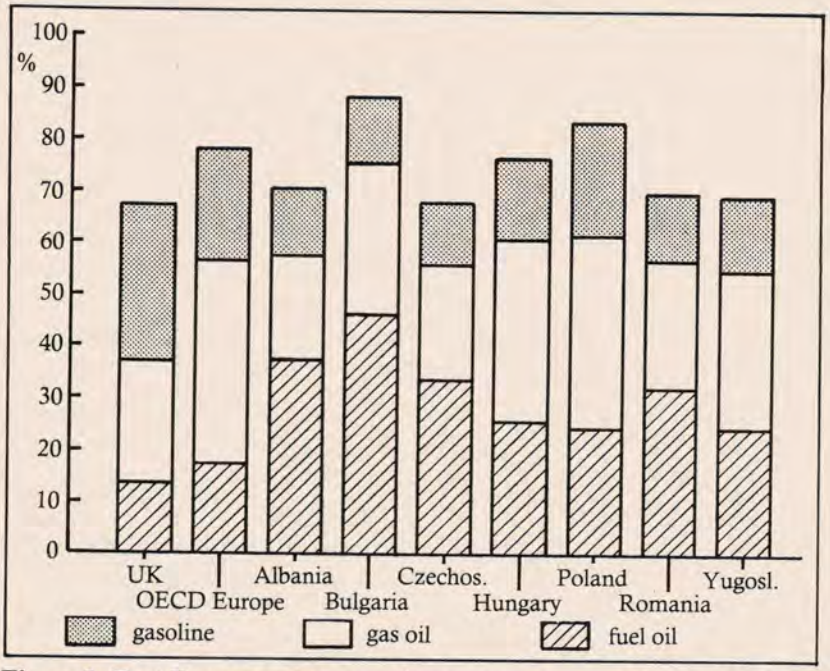


Figure 3: East European consumption pattern compared with Western Europe

the economies of Eastern Europe recover from central planning. The immediate problem is to provide fuel for a highly inefficient energy intensive industry and to meet the consumer demand for electricity and heating. Fuel oil will continue to play a vital role as alternative fuels are all causing problems.

Indigenous hard fuel, coal or lignite, is polluting the atmosphere and public pressure is forcing governments to reduce its use. Nuclear energy is running into similar problems after the Soviet Union demonstrated so successfully the risks involved in operating one of their reactor types. The best alternative fuel will be natural gas. Initially extra volumes will have to come from the Soviet Union but the way the European gas pipeline network is integrated volumes could be exchanged with other supply sources.

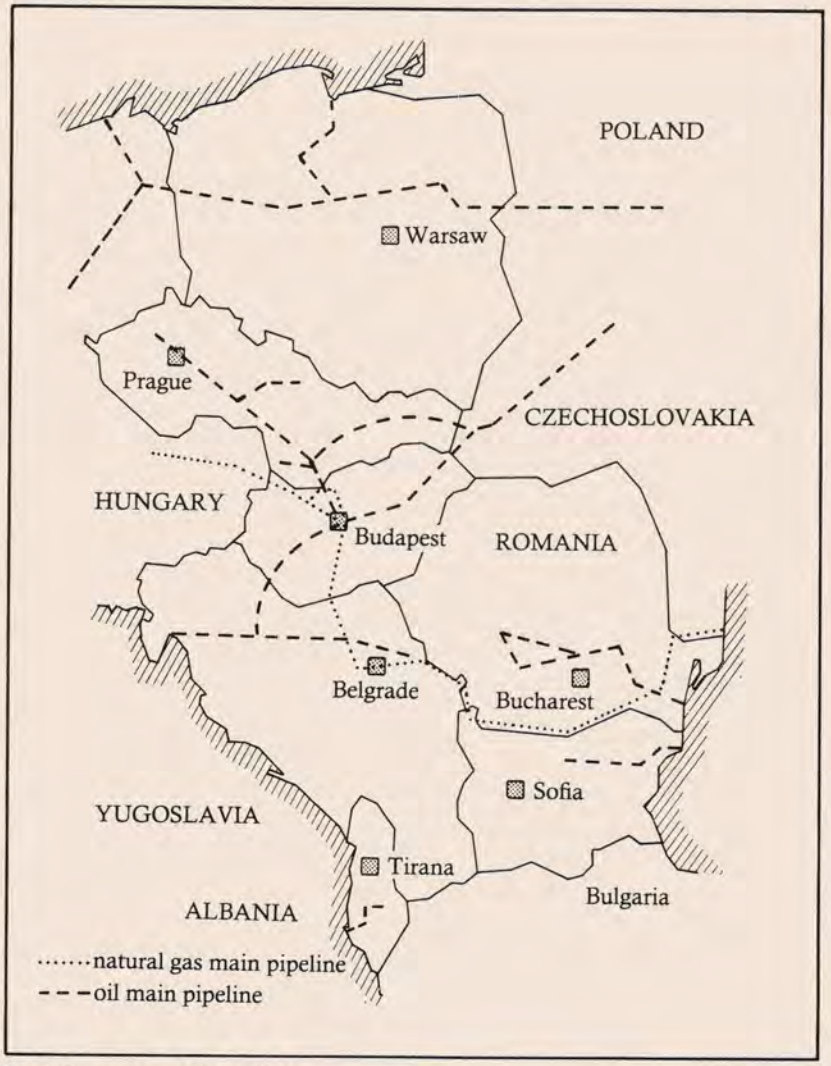
The added advantage is the low pollution level of gas. Some problems will arise because power stations have been frequently built next to refineries. They would have to be linked to the gas network and equipped with new burners.

The good news is that when the economy recovers the first sign is actually a drop in fuel consumption as the least efficient plants are being closed. East Germany has just experienced such a fall in fuel demand.

Refining

East Europe has a large number of refineries but very few big modern refineries. They are facing a problem evident elsewhere some 10 or 15 years ago. Over-capacity built to provide products for the export market and hard currency earnings is suddenly idle. The lack of cheap crude from the Soviet Union and the high cost of running some of the capacity make it impossible to keep them in operation. Some small refineries are reasonably economic to operate because they have very specialised functions. Eastern Europe is dotted with oilfields. Sometimes it makes sense to have the refinery right on top of the field, especially if it is heavy crude and difficult to transport. You can make money out of a distillation column which produces a little bit of lube oil, feedstock and bitumen even in California.

Refiners are now hoping to fill some of their spare capacity through processing deals with western companies. This makes sense. The only problem is that they will have to pay market prices for their own consumption, making it



East European oil market

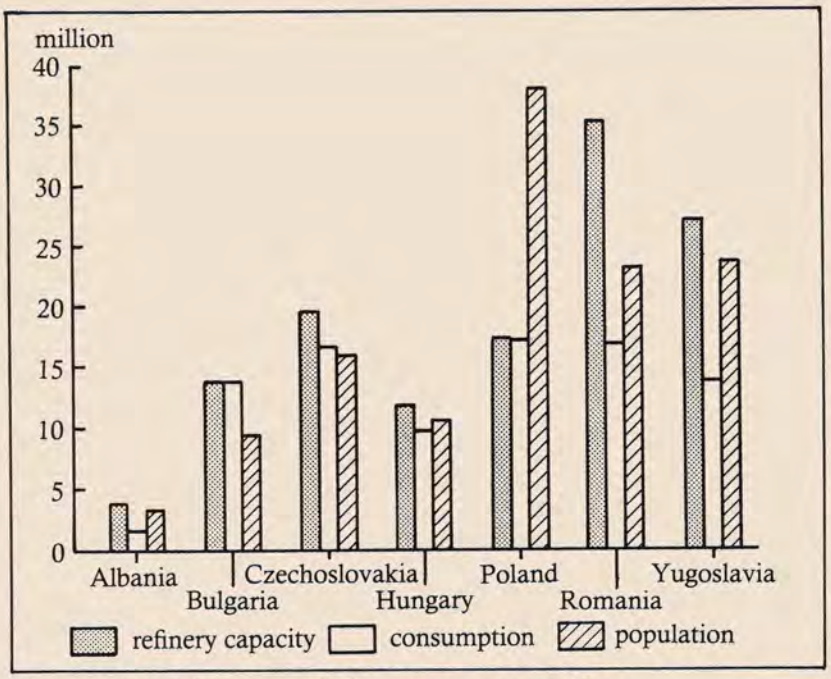


Figure 4: East European refining versus consumption

more difficult to face the competition of western refineries with a higher degree of upgrading and energy efficiency. Yugoslavia has managed recently to secure a processing contract with Marc Rich on the basis that they retain some of the product as payment.

Figure 4 shows refinery capacity, consumption and population for each East European country. It demonstrates the degree of overcapacity that exists. There are only two countries, Bulgaria and Poland, where capacity actually matches consumption. To be fair, a certain proportion of the capacity is probably not available in reality, as refineries have not been running to full capacity or maintaining capacity in their books that has fallen into disrepair.

The most noticeable over-capacity exists in Yugoslavia and Romania. The background is, however, quite different. Over-capacity in Yugoslavia is politically motivated. The regions in the past insisted in having their own refining capacity to demonstrate their independence. In view of current developments in Yugoslavia, they might have a point and we could soon have half a dozen independent states with over-capacity.

Romania, in contrast, has 13 refineries but the bulk of its capacity, 28 million tons/year, is concentrated in five modern cracking refineries. The spare capacity could be economically used to provide products for export into other East European countries. The Danube would be a very cheap transportation route. The danger is that Romania might not be able to maintain this spare capacity till such time that the East European market has developed sufficiently.

The other interesting message from this graph is that some countries rely far less on petroleum products than others. The obvious example is Poland with by far the largest population of all East European countries but consuming little more petroleum products than the small countries. The simple reason for this is that the Polish industry is coal-based. This has an unfortunate side-effect in that pollution levels in the industrial south are tremendously high. The government is under severe pressure to reduce pollution levels. The only solution is to increase the use of natural gas or fuel oil. The extra supply has to come from USSR imports, at least initially, not a very good timing.

I would like to close this paper with a question. What does the future hold for the refining industry in Eastern Europe? Europe is heading for a shortage of refinery capacity due to the decline in gas oil imports from the Soviet Union and the Middle East. Plans for new capacity, even new refineries, are being drawn up already, for instance in Germany. I believe a cheaper solution would be to use the infrastructure of existing but uneconomic refineries in Eastern Europe to build modern capacity. It is also the area where the long-term market growth can be expected. It would also require the extension of the pipeline systems to link into West European lines. Unfortunately the political instability in Eastern Europe discourages major investments by western companies at the moment. Petroleos de Venezuela's plan to buy three refineries in Czechoslovakia is a noticeable exception. It appears to me that East European's refinery industry has very little time to overcome this hurdle before decisions are taken to install the capacity in the west and ship products to Eastern Europe. ■

This article is based on a talk given to the IP London Branch in March.

Forecourt show preview

The forthcoming Forecourt Marketing and Equipment Show has a strong international flavour. With 1991 and the Single Market just around the corner, British, Continental and, in particular, American exhibitors appear to be viewing the show as a springboard into Europe.

The exhibition's organisers, Pinner-based Blenheim Pel, is promising the 'biggest and best' show yet. With an estimated 240 stands occupying around 16,000 square metres of space, and upwards of 9,000 visitors expected through the turnstiles, few will accuse them of hyperbole.

As in the past, the event is staged in the National Exhibition Centre near Birmingham. The three-day event opens for business on 4 June. At one time, the show was a colourful, exciting assortment of wildly diverse companies nestling side by side, but the 1991 event, like last year's, will be a more orderly affair. Forecourt equipment and car wash hardware will be located in Hall 8, while the adjoining Hall 7 will be home for the vast array of shop products that are today sold in forecourt stores. This year, Blenheim Pel has turned Hall 7 into what is virtually a show within a show, calling it the Convenience Retailing event.

As car shows once were, the Forecourt show is a focal point for the introduction of new products. Predictably, many companies are keeping their innovations under wraps to gain maximum impact at the show, but on the equipment side, new lines are promised by Wayne Autocourt, Gilbarco and Edacom. The latter will unveil an advanced payment terminal, while Gilbarco has revealed that the show will be the launch pad for a new European range of pumps.

When the show was first staged in 1987, Elf was the only oil company to participate. Over the ensuing years, other brands cautiously moved in. This year there are seven, including regulars such as Jet, Texaco, Gulf and Q8. Shell and Total this year make their first appearance and Elf returns after a gap of several years. For Shell, the exhibition is seen as an important opportunity to promote the Shell Share Franchise.

In addition to a number of UK companies making their debut, there will also be a tidal wave of newcomers from overseas. The largest influx will be from the USA where more demanding environmental legislation has given US forecourt equipment suppliers what they perceive is a useful edge in pollution control experience and technology. With green issues dominating petrol markets across Europe, the Americans see significant opportunities awaiting them this side of the Atlantic.

Acknowledging the increasing industry-wide interest in environmental matters, this year's show will include a feature stand dedicated to forecourt products deemed to 'come under the umbrella of environmental protection.' Included is a wide range of products, such as vapour recovery pumps, tank overfill protectors, hydrocarbon-sensing cables etc, from companies like Gilbarco, Normond, Conder and Kalon Chemicals.

Together with the increase in foreign exhibitors, Blenheim Pol is convinced the show will attract overseas visitors in greater numbers than ever before. Since last year, the organisers have invested time and money into strongly promoting the show overseas and do not disguise their ambition to develop their event into Europe's largest and most influential forecourt exhibition.

To ensure visitors from overseas make the most of their few days in Birmingham, translation services are available together with a range of office facilities. For those worn out by walking the miles of aisle space, the organisers have thoughtfully installed an in-show television display in the hospitality area that will 'offer up-to-the-minute information on products on view.'

Research carried out over the past year has indicated a demand for a seminar to operate in conjunction with the exhibition, and Blenheim Pel has been quick to respond. It has organised two separate programmes that will be staged on the first two days of the show. The cost for delegates is £25 per day. Day one will be chaired by Jamie Thompson, Principal Petroleum Inspector for London, and will include speakers on vapour recovery, pollution control, driver-controlled deliveries, equipment maintenance and car wash. Mr Bruce Petter, the President of the Petrol Retailers Association will also give his view of the future of petrol retailing in the independent sector. On the second day there is a clear change of emphasis, with subjects ranging from retail security to EPOS to selling newspapers.

Belheim Pol has little doubt that its first foray into the world of forecourt seminars will be a success and it is already planning for 1992 and setting its sights on a London-based pan-European conference. Like all successful exhibitions, the Forecourt Show has prospered by actively reflecting the industry it serves. So, if you want to know what is happening in the forecourt sector, both now and in the future, open your diary at 4–6 June and make a date to be at the NEC. ■

Peter Noble

British Fuels' new forecourt display unit

A western oilman's view of the Soviet Union

By Dr Paul Jennings, Senior Economist, BP Exploration's USSR Group

The Soviet Union remains the biggest single producer of hydrocarbons in the world today. Current rates of oil production stand at just under 11 million barrels a day (b/d).

During the 1970s and 1980s, oil production in the Soviet Union steadily increased, reaching a peak of 12.8 million b/d in 1987. Since 1987 the production rates have been in gradual decline to the current rate.

The decline in production has been due mainly to three factors:

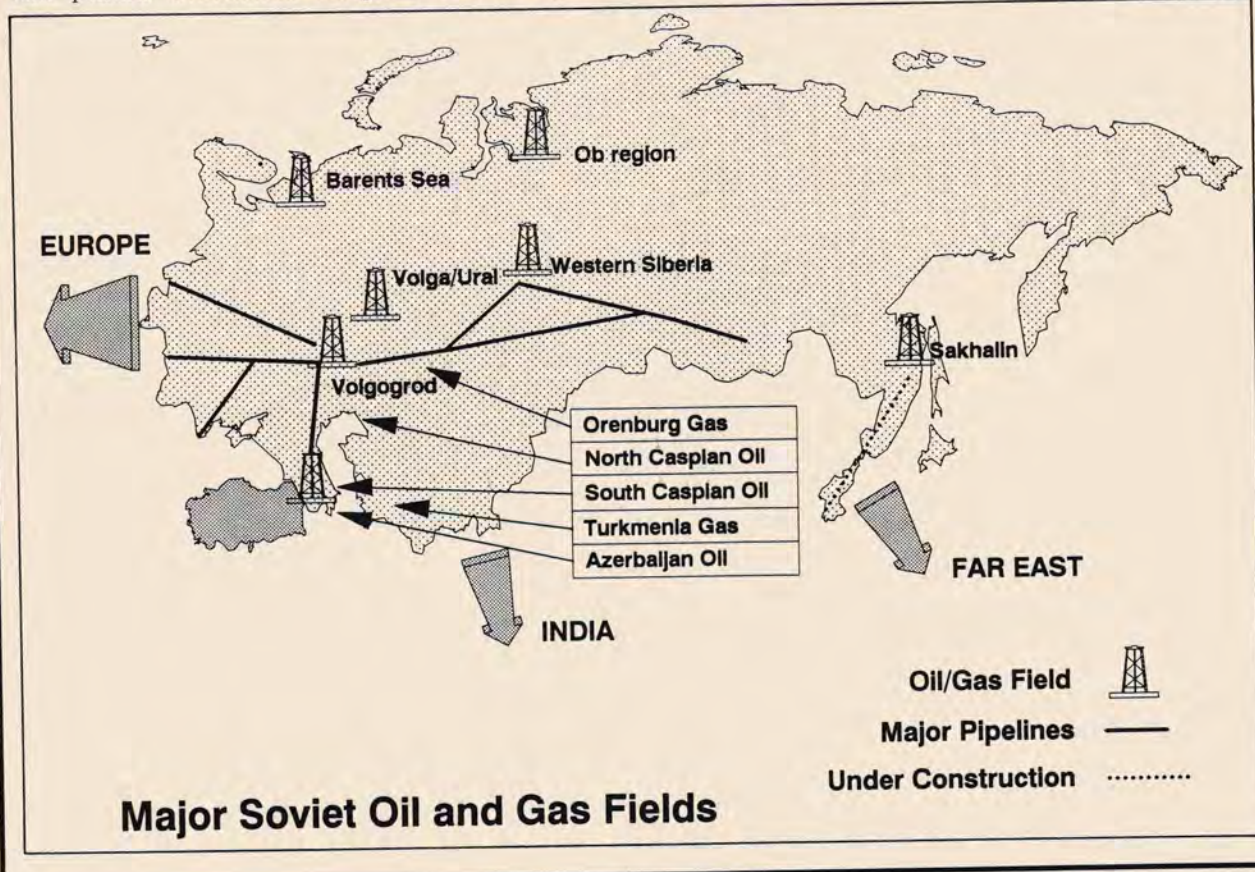
- natural decline of the giant Western Siberian basin,
- lack of application of new technologies . . . of oil and gas exploration and production,
- central government cutbacks in capital investment in the industry.

The Ministry of Oil has, along with the Ministry of Geology, recognised these problems, and combined with the new political environment brought about these now much over-used terms *glasnost* and *peristroika*, opened the doors to Western investment.

During the late 1980s, many Western oil companies beat a path to their doors at Marisa Tereza Embankment opposite the Kremlin and 4/6 Gruzinskaya.

The West had always been aware of the significant potential of the Soviet natural resources, but I believe that most Western companies were still shocked by the enormity of these resources and the problems of bringing them to the market.

One of the first companies to approach the Soviet Union was Chevron. In conjunction with an American consortium of non-oil companies, they were directed to Western Kazakhstan. Negotiations started with respect to the development of the Korolovskoye field. The basis of the deal was that the Soviet Union would utilise their share of the hard currency generated from the project to pay for



Major Soviet Oil and Gas Fields

goods supplied by the American consortium. Later the giant Tergiz field was added to the deal, which has taken at least three years to finalise.

The negotiations were initiated by Moscow with most of the benefits reverting to Moscow. As time has passed, the republic has started to flex its muscles, and the goal posts have moved. This single fact has been the cause of most of the delay.

The next major development in Western involvement came through two small data packaging companies, Jebco and PGI. These companies attached themselves to the Ministry of Geology and Ministry of Oil and Gas respectively. Data packages were marketed by Jebco on behalf of the Ministry of Geology for areas in Timan Pechora, North Caspian and Eastern Siberia. At the same time, PGI were marketing smaller packages from the Ministry of Oil and Gas in Western Siberia.

There was significant interest from the industry in these packages, but this exercise was not only successful in marketing data, it also drew our attention to the potential in the USSR. The flood gates were opened. Throughout 1990 you could not move in Moscow without bumping into oilmen. Every week there was a new batch of 'deals' being struck. To call them 'deals' would be misleading, in most cases they were one page 'protocols of intent', morally binding, but with virtually no legal status. It is important to note that when we say morally binding, the protocol is only binding on the man who signed it, and he could be over-ruled at anytime.

The main areas of interest for the western companies are:

- Western Siberia — Conoco, Shell and Mobil
- Timan Pechora — Texaco
- North Caspian — Unocal Amoco
- Azerbaijan — Unocal Amoco, BP/Statoil
- Sakhalin — Exxon, Japanese
- Turkmenia — Deminex, Repsol, Norsk Hydro, British Gas.

Major problems

If we ignore the logistical problems of travel and accommodation, the main problems are:

- Access and data — In many cases this will be through a third-party High Court but beginning to come down.
- Fiscal/commercial legislation — To date there is no Petroleum Legislation in place, therefore deals have to be struck using existing Foreign Investment Laws, which are by no means ideal.
- Ownership of resources — This is becoming a little clearer. The draft Union Treaty is moving towards republic ownership of hydrocarbon resources. But this is just step one. How will the Republics pass this ownership on? Will the western investor get title to production? This still remains unclear.
- Value of the rouble — currently ranging from 1.8 roubles to 25 roubles to $1. Which rate will be used for valuing investments?
- Pricing — We have seen recently some moves to bring prices closer to world values. However, combined with the exchange rate problem, internal Soviet oil prices are still extremely low.

All this apart, there are still a great number of opportunities being chased by the industry. The capital investment required will be enormous. To the Soviets it may appear that the only constraint to western investment is the opportunities available. However, if/when these deals start to be concluded, western companies may find that the major constraint could be the number of exploration discoveries required to justify these investments. ■

'We invest to run on Kuwaiti crude'

By Carol Reader

Kuwait Petroleum may have suffered all manner of disasters from last August onwards but the group is not daunted. Its spokesmen still sound confident as they now plan energetically for the reconstruction of their industry in Kuwait, regaining control of the damaged oil wells and the restoration of the three refineries and other facilities.

While the Kuwaiti government and many of its oil industry personnel were in exile, maintenance of the group's activities in Europe was the first priority — alternative crude and product supplies were immediately obtained from Saudi Arabia and the Rotterdam spot market and sufficient documentation provided to central banks to free the group from the banking restrictions, imposed immediately after 2 August by the United Nations and many national governments at the behest of the Kuwaiti government in exile.

The second priority was planning for the return to Kuwait and the revival of the increasingly devastated oil industry, the mainstay of the economy.

However, at the same time planning for the expansion of their business overseas did not stop. Kuwait Petroleum first came to Europe as a marketer of products in 1983, with the acquisition of Gulf's refining and marketing operations in the Benelux countries and Scandinavia. These operations spread to the United Kingdom in 1986. Last year they were still growing — expanding their business in Italy, adding more service stations and the refinery at Naples, giving the Q8 brand the third largest market share.

According to Ralph Brown, Director, New Business Development, Kuwait Petroleum International Ltd (KPI), speaking in London last month, 'Our mission is to go on expanding'.

Into Hungary

The latest target for Kuwaiti expansion is Eastern Europe, firstly Hungary. The Kuwaitis announced in January that they were going to take over 17 outlets in Hungary in a joint venture with AFOR, the Hungarian state marketing company. This is the company's first move into Eastern Europe, a market which had been intensively studied for the past two years.

Along with other western oil companies, KPI realised that as Russian crude production dropped and the former Eastern Bloc countries wanted more crude and products, there would be opportunities for new suppliers. Generally, the existing state-owned monopoly companies were short of capital, while at the same time there were insufficient service stations and often inadequate distribution systems, while the refineries were entirely dependent on Russian crude supplies.

Mr Brown told *Petroleum Review* that he saw four major structural problems facing petroleum marketing in Eastern Europe. Firstly, a physical shortage of distribution facilities. Secondly, a lack of a 'private' business sense. Few people in the Eastern economies have been educated in the basic management economics and skills, routinely used in the West. As a result not many people have the management skills, knowledge or experience to be able to operate a service station or other small business successfully. Most Eastern European service station chains are government monopolies, with no competition and the stations themselves operated by employees of the monopoly.

Thirdly, ownership of property. Theoretically, the great majority of people accept and even want private ownership but none has existed for 45 years, except in Poland. Many administrative problems surround the creation of private land ownership — how can state companies dispose of land and what about former owners?

Fourthly, the general lack and poor condition of facilities, described as being 'back in the 1950s'. Since there are not enough service stations, throughputs are abnormally large and queues are normal; the quality of fuels and service is poor or lacking — they are not 'customer friendly', as understood by marketers in the West.

Mr Brown said that he believed economic growth in most of these countries would be 'explosive' and that many changes were on the way. In his view, as economies became freer and more competitive, different service stations would emerge — more on western lines. However, it would be a slow business to introduce a dealer system because of the general lack of experience in managing a small business.

Western interest

Because Hungary has a fairly stable political climate, is strategically situated in central Europe and is increasingly short of crude and products, western companies have been keen to enter the market, while others like Shell and BP have been there for some years. Shell, with a presence for 40 years, has around 60 service stations, while BP has a joint venture with the state company, AFOR. AGIP is a newcomer, while Esso and Total have both moved in within the last six months. Aral's sign has appeared only in Budapest so far. OMV and Mobil are also showing interest.

Future developments

Problems, largely of a bureaucratic nature, still exist. However, petrol prices have been freed and now float with world market prices, while imports and exports are also freer.

There is also the government's stated intent to reorganise OKGT. This is the enormous state-owned oil and gas trust, with a work-force of over 45,000, that does everything in the oil industry from exploration and production, to transportation, distribution and marketing of oil, natural gas, petrochemicals and related services. The government is probably going to divide this trust into several parts to make it more manageable, more workable. The possibility of this split has been under discussion for months, with the result that this uncertainty over the organisation's future structure is holding up decision-making and possible moves by western oil companies.

Kuwait Petroleum, for instance, is still talking to the government about some sort of joint venture in refining. It has been having a discussion over a deal for the upgrading and operating of one of the four state-owned refineries — at Szazhalombatta, just outside Budapest. This refinery has been running entirely on Russian crude. One of the options for Kuwait Petroleum in the long term is to supply its own crude from Kuwait which could be imported via the existing Adria pipeline from the Mediterranean through Yugoslavia. Nasser Al Salem, Vice President of Kuwait Petroleum International, emphasised the point, saying 'We invest to run on Kuwaiti crude.' He added that upgrading the refinery would produce some surplus of clean products for disposal — perhaps to neighbouring countries.

HE Rasheed S Al-Ameeri, Petroleum Minister of Kuwait, after the signing of the Hungarian contract.

HE Al-Ameeri, Mr Istvan Matyas, Managing Director of Technoimpex and Dr Istvan Sokorai, Managing Director of AFOR.

In the past Hungary was mainly dependent on the Soviet Union for crude oil (Hungary still produces about 15 percent of its own requirements). The volume of cheap Soviet oil delivered in 1990 was around 100,000 b/d, 30,000 b/d less than planned, and even less is forecast for this year. Alternative supplies are urgently required — one contract recently signed is with Saudi Arabia.

These alternative supplies are costly — barter and soft rouble deals are at an end. Now the Hungarians must pay some three times more for their oil supplies than in the past — or even more during the early days of the Kuwait crisis.

Observers believe that Hungary is well equipped to make the move from a planned economy to a free market. At this stage with unemployment, recession and falling standards of living threatening, it is better placed than some of its neighbours. Its currency is more healthy than some and a cautious welcoming hand is gradually being extended to foreign private enterprise. ■

Focus on high technology lubrication for the car

Nick Wellman, who was recently promoted from Manager, Lubricants Division, Elf Oil (G.B.), to head of European Marketing of Automotive Lubricants, Elf Oil in Paris, discusses in an interview with *Petroleum Review* the background to a new concept in lubrication service that is developing in all western European countries — although not yet in the United Kingdom.

At the same time he describes how lubricants companies are stepping up efforts to bring the UK motorist up-to-date about the dramatic quality changes in lubricating oils technology over the past 30 years.

Geoffrey Mayhew: Is a change developing in the lubricants industry?
Nick Wellman: Yes it is. I think that the technology for typical mineral engine oils has nearly reached its peak. Engine manufacturers are continuing to search for mechanical solutions to prolonging oil life by reducing the volume of contaminants likely to reach the oil. It is clear that resistance to oxidation will then assume a greater importance.

What about developments of improved base oils?
I am sure that greater use of Very High Viscosity Index (VHVI) hydrocracked base oils will be seen in order to reduce volativity and allied emissions. At the same time, the market will demand more synthetic lubricants as the 'cult' for this segment grows in proportion to the number of high priced, high performance cars in use.

Does the public really appreciate the difference between different companies' products?
It is an interesting point, because companies are once again seeking to differentiate their products more and more from each other.

They are doing this, of course, by marketing improved mineral oil based products as well as high technology synthetic based products. At the same time, each company is looking for a marketing angle in which to promote the sales of those products.

Is this happening particularly in the United Kingdom?
It is. The United Kingdom is a fascinating market because it is so much more competitive than other European markets. Yet the consumer here, I think, has been less well educated about advances in lubrication than the industry would like him to be. This applies strongly to the motoring sector, and indeed the industry must take a share of the blame for the motorist's inadequate education.

The problem is that too many consumers, in overall terms, have not yet recognised that using high quality lubricants is a vital part of the maintenance programme of the vehicle, and one which can save him significant amounts of money in the long term.

Is it the same in mainland Europe?
In many other European countries the perception of the price to quality of product is more clearly appreciated than it is perhaps in the UK. In Germany and France, for example, the motorists tend to think that paying a higher price for the lubricant provides a better quality product. In the UK, there is a tendency to think that higher priced products are simply over-priced, and do not necessarily guarantee the

'In the United Kingdom, there is a tendency to think the higher priced products are simply overpriced'

How has this come about?
I think the origin of this goes back a long way — to the 1950s when the first multigrade lubricants were marketed, the 20W/50s. It is amazing how long, and how durable, this feeling of quality associated with 20W/50 has lasted.

That was, of course, a major innovation at that time, and its impact has left a perception in many minds that a thick oil will work better and longer in a car's engine. In the 1950s and 1960s it was indeed better than anything else. But the industry has seen dramatic improvements in vehicle engine design and manufacture, and the principles of those days are no longer good enough for today's lubrication.

I think it is quite frightening to see today, 30 years later, those products still being widely used in vehicles.

motorist the quality the price implies. This point of view is usually quite wrong.

The lubricants industry has recognised its duty to the consumer, the car manufacturer and to itself to help in educating the consumer in the understanding that the use of high quality, high technology products will be both beneficial and cheaper in the long run. The drive to do so is now being stepped up.

One of the areas in which Elf assists in this respect is through its close working relationship with Renault, and we do this on an on-going basis. There is a team of Renault and Elf technicians which is constantly seeking to improve and modify both engine

Nick Wellman

and lubricant design. The object is to reach the optimum performance available for a particular development.

Close collaboration between engine manufacturer and lubricants producer, coupled with a better message to the consumer, we think, is the way forward.

Is it the same with the lubrication of heavy goods vehicle engines?
The same attitude applies, and one of the ways in which oil companies can assist fleet operators to understand the benefits of proper lubrication is by offering them additional services — for example, wear and metal analysis.

What is that?
It is an effective method of monitoring the internal wear of an engine by taking a used oil sample at each oil change interval and subjecting it to analysis by a photospectrometer to count the particles of metals in suspension. These results are compared against engine wear models held in the computer database to see if any abnormal wear is taking place. Corrective action, then, can be taken sooner rather than later.

It means that, in a planned manner, inconvenient and expensive breakdowns can be reduced.

Is lubrication taken for granted by many consumers?
It is. It is often not a simple matter to get across an educational message in a way that is easily accepted by the motoring public. However, one good example of this recently, was when Shell produced an excellent campaign designed to emphasise the changed face of motor vehicle design and performance levels. I thought the message was simple and clear. For our part, Elf, in conjunction with Renault, have produced a number of quite detailed publications to try to explain why our specialist range of lubricants in Renault cars should produce better results over a long period of time.

Since the first 20W/50 lubricants were formulated and marketed, there has been a continuous development, including an improvement in both additives and base stocks, which enable lighter viscosity oils to be manufactured: the result being far greater wear protection properties. At the same time, improved fuels consumption and better starting in cold weather, etc, have been achieved. Indeed, the latest generation of lubrication oils reach all working parts of an engine within seconds of start-up.

The improvements since the 1950–60s have passed through a number of important stages, not all of which were accepted at once. I recall that when the first 15W/40 and 10W/40 lubricating oils were produced, there was consternation, even among motor manufacturers who, in some cases, were reticent to approve the use of these products in their engines.

Since then, continuous developments have taken place in mineral oils, using extra refined base stock and the use of synthetic-based products is increasing steadily.

Synthetic base products still represent a small part of the market, but it is in a fascinating state of development. In our own case we have very much linked this development to the enormous demands imposed by the high revving, high performance engines used in motor sport. Notably Formula One motor racing.

In this area, Elf was early in the field. We recognised even in 1966 the benefit of having a close association with Formula One as a means of a real test of our products, whilst at the same time keeping our name in front of an influential section of the public.

Support of major UK names in the sport has also enhanced our image and credibility. Jackie Stewart, probably one of the sport's greatest ambassadors, has worked closely with Elf since his days first with MATRA, and then with Ken Tyrrel, and finally up to and beyond his retirement. I believe he cherishes fond memories of the close association he had with Elf. But it goes beyond that. When we supported the JPS Lotus Team I remember Peter Warr saying that he was amazed at the way a company like Elf could react worldwide to meet the needs of technical problems which inevitably arise. For Elf, in these circumstances, we have to demonstrate our commitment and expertise on a continuous basis to people who rely on us and our support to get it right.

But the motorist is the real beneficiary. After each race samples of used lubricants are sent to our laboratories in Solaize, near Lyon, for full analysis. The results teach us important lessons about the use of our lubricants in the most testing conditions possible. Today, of course, the lubricants are essentially synthetic and we will be launching a similar product onto the market later this year.

The new Renault Clio

Do motorists' attitudes to lubricants vary greatly?
Motorists can be divided into several categories. There is the man who never checks his oil between oil changes; the man who will put anything in his engine provided it is oil; the man who only believes in thick oils or thin oils, or only in mineral oils or synthetic oils. The attitude range is enormous and serves to underline this tremendous need for better information, better guidance and education. Even with oil change intervals a difference can be noticed. Some stick rigidly to manufacturers recommendation, whilst others change more or less frequently perhaps depending on how they feel about their car at the time. It is a tremendous mix.

How should a motorist deal with the lubricant situation?
He should be more careful in following the recommendations in the handbook made by the manufacturer. For their part, manufacturers could be more careful in underlining the fact that these recommendations are important to ensure the maximum life of the vehicle. There is an interesting phenomenon in this respect.

In France, for example, a motor manufacturer will tend to work very closely with a particular lubricants manufacturer. Ths does not appear to happen in the UK, where most manufacturers carry out independent research and many also have a range of own branded lubricants apparently preferring not to ally themselves with a specific lubricants producing company.

In contrast to this, the co-operation between Elf and Renault is very strong. Indeed, it is evident in a specific range of products for a specific range of cars. In deciding what product he is going to use, the motorist knows he can rely on one oil range and that the quality has been underlined by the working relationship between engine designer and lubricants company.

Will there be changes in lubrication servicing?
The method of maintenance of motor vehicles could well change. For example, currently in the new car market in the UK some 50 per cent of vehicles are being sold to companies. The probability is that for the first two or three years, when in company ownership, these vehicles will be maintained by the supplying dealer or a well respected local garage.

But once these vehicles fall out of company service they may be maintained in a different way. As their age advances the likelihood of garage maintenance becomes less and less.

In that event, and even taking into account the best solution — which is that individual car owners have the time and will take the trouble to carry out themselves a proper maintenance service — the situation must give cause for concern.

'The co-operation between Elf and Renault is very strong'

What may happen?
It means that pressure for a low-cost fast service in the area of lubrication must grow greater. Probably for cars falling outside of the franchised dealer catchnet.

As a company Elf have recognised this trend. On a European basis we are introducing the Jiffy Lubrication Concept, branded Jiffy Lube. This is the establishment of specialist centres which give the motorist a 14 point service, including lubrication and change of oil, within the space of 10 minutes. No appointment is necessary, and the opening hours are extended for the convenience of customers.

The object of the enterprise is minimum downtime for the vehicle. There is no engine maintenance or petrol sales. The Jiffy Lube Concept originated in the United States in the late 1970s, where there are franchises across the country. Currently, Jiffy Lube accounts for approximately 30 percent of the oil change market in the US. Elf's position in Europe is that we have decided to operate it in all western European countries, with the exception of the UK at the present time. We currently have 24 Jiffy Lube Centres in Germany, Belgium, Holland and Italy as well as France; and we also have the franchise to operate in Switzerland, Spain and Portugal.

The concept calls for a change of oil at 3,000 miles, a huge safety margin against manufacturers recommendations, but it's more than that. With the other parts of the service including the checking of all fluid levels, and the inside cleanliness of the car, it is becoming a whole car care programme rather than just an oil change. It promotes the concept of really looking after your vehicle at quite reasonable costs. In the US, it is not uncommon for a successful franchise to be processing up to 200 cars in a day.

Recently I was in Canada, where Jiffy Lube has been launched, although not by Elf. While a dedicated car lubrication service has been available there for 15 years, it is only now beginning to grow, as the public accept a new idea in vehicle care.

Is the service really going to catch on in Europe?
We are sure it will, and while most of the Elf Jiffy Lube outlets will be franchised, we will have some which are company owned for test and monitoring purposes.

In our opinion it follows the increasing practice of people seeking to buy one item of service at one time. This started with food, which has led to the development of hypermarkets, and it has progressed to the marketing of a

Williams-Renault Formula 1

wider and wider range of services following the American experience.

When will it come to the United Kingdom?

I think it will come to the UK, in the fullness of time, but perhaps the market is slightly behind the others in being ready to accept it. The huge investment required, because such individual centres have to be developed to a very high standard of design if they are going to be able to maintain the desired level of rapid service, means that returns in a relatively low priced market are harder to achieve.

But one can see the beginnings already, in the form of quick oil changes being added to the services offered by fast fit tyre and exhaust centres. ■

Electrostatic hazards from fuels in plastic pipes

By R T Jones and G L Hearn, Wolfson Electrostatics,
Department of Electrical Engineering, University of Southampton

In fuel handling, electrostatic effects can be beneficial, as shown, for example, in studies at Southampton University in which applied electric fields improved the atomisation and combustion of doped petrol using a modified carburettor. Conversely, electrostatic effects can be hazardous as cleaner fuels, increasing throughputs and novel materials for pipework construction are continually introduced. It is this aspect of electrostatics that is discussed here.

Electrostatic discharge cracking a plastic pipe conveying highly charged Diesel fuel. The lightning-type spark can be seen puncturing the pipe and igniting escaping fuel droplets.

Electrostatic charge is generally produced in fuel being pumped along pipes, whether constructed from metal or non-conducting plastics. The charging process arises from the presence in parts per million (or billion) of ions in the fuel. Positive or negative ions selectively attach themselves to any interfacial surface in the fuel, such as the inner wall of the pipe, due to either electrostatic attractive forces or preferential chemical adsorption. As uni-polar charge accumulates on the wall, ions of the opposite polarity in the fuel are attracted. A charged layer then extends from the wall into the fuel, further contributed to by any dissociation of surface chemical species into ions. The net charge in the pipe, however, is zero when the fuel is at rest.

When the fuel flows, the ions in the boundary layer tend to be carried along, while the opposite charge on the wall dissipates to earth at a rate depending primarily on the wall material's resistivity. A streaming current is therefore associated with the flow of fuel. Its magnitude depends upon the differences between the positive and negative ions in their diffusion rates to the pipe wall, and their adsorption rates onto the wall. These properties in turn depend on the fuel's conductivity and flow characteristics, together with the wall's dimensions, conductivity, chemistry and surface roughness. The relative contributions to the streaming current of the ionic diffusion and adsorption rates at different pipework locations, or for different flow conditions, may alter, leading to changes in both the magnitude and sign of the current.

In a long metal pipe, the streaming current reaches a steady value when the rate of charge generation equals the rate at which charge dissipates to earth. Typical values are 10^{-7} to 10^{-10} amperes. Any filters, valves generally increase the streaming current, due to greater interfacial charge separation, higher fuel velocities and increased turbulence. Similarly, the presence of free water in the fuel can increase the current to several microamperes, again due to the charge separation arising from the large interfacial area of the emulsified mixture. For fuel entering a storage tank, the concentration of electrostatic charge introduced is given

by the ratio of the streaming current to the volume flow rate. The charge will be increased by splashing, foaming, turbulence or increased emulsification. If the charge does not immediately relax to earth, ie when the conductivity of the fuel is low or if the tank is plastic with no submerged earthed conductor, it is possible for an electrostatic brush discharge to occur from the fuel surface which may ignite the vapour in the ullage space. The probability of ignition, however, is generally low; Dr H L Walmsley (see *Petroleum Review*, December 1990) has estimated that under certain standard road-tanker filling conditions, one in 10^7 fills may cause ignition by an electrostatic discharge. The risk is low because the following conditions all need to occur simultaneously inside the tank:

a) The fuel surface acquires a potential greater than 20 kilovolts.

b) An object at a lower potential is close to the fuel surface so that an electrostatic discharge between the two can occur.

c) The vapour concentration exceeds the lower flammability limit; because the temperature is above the flashpoint, or because of the enhanced vapour concentration due to foaming or splashing, creating evaporating aerosol droplets in the ullage space.

d) The vapour concentration is less than the upper flammability limit, above which there is insufficient oxygen to support combustion.

e) The energy of the electrostatic discharge exceeds the energy required to ignite the vapour. In practice, the discharge energy often needs to be in excess to cause ignition.

Non-metal pipes

The electrostatic behaviour of fuels in metal pipework is reasonably well understood. In contrast, the charge levels and streaming currents developed in plastic and other insulating pipes depend markedly on the inner wall chemistry, and usually cannot be predicted for new pipe materials. However, in such pipes, the streaming current carried by diesel, kerosene and other insulating fuels may actually decrease with flow time, because charge cannot easily dissipate to earth and instead accumulates on the inner pipe wall. This charge then opposes further charge separation at the wall. The major hazard is then not the streaming current but the electric field set up through the pipe wall to the outside. Structural damage can result, such as pin-holing or cracks, particularly when the field is intensified by external contacting metal clamps, supports or other earthed components. Electrostatic discharges that puncture the wall can ignite escaping fuel. A solution to this problem, if the process allows, is to make the fuel more conducting, by adding a few parts per million of an ionic agent. A low resistance path to earth then prevents charge accumulation. For high conductivity fuels, above 10^4 picosiemens per metre, the streaming current becomes constant, as in metal pipes. Electrostatic hazards can be reduced by using pipes and valves of maximum bore to minimise the fuel velocity, and locating filters and other constrictions away from the vapour-air mixtures in storage tanks. Each conducting component in the pipework system should be earthed, otherwise charge may be induced by the electrified fuel and then released in the form of an energetic spark discharge to earth, possibly igniting flammable materials or causing physiological shock. Excessive charge generation by splashing, foaming and agitation of the fuel can be avoided by using storage tanks with bottom inlet ports, or with diplegs having submerged ends.

Safety guidelines indicating permissible fuel flow velocities, and necessary earthing procedures with plastic storage tanks are mentioned in British Standard 5958 Part 2. This standard is being revised and may include an increased threshold value of fuel conductivity of 1000 picosiemens per metre, below which electrostatic charge can accumulate to an extent that is considered potentially hazardous. ■

APEA Conference

Timor Gap permits released

Australia's oil exploration frontier was widened with the release of 21 offshore exploration areas, including three in the Timor Gap area, where the Federal Government has reached agreement with Indonesia for development. These releases in the joint Australia-Indonesia development zone will be in the Australian-administered block B area. Federal Resources Minister Alan Griffiths said exploration in this area and the jointly-administered block A would proceed in spite of moves by Portugal to challenge the legality of the bilateral border agreement between Australia and Indonesia.

The new block B releases in the Timor Sea (NT91/1), (NT91/2 and W91/12) are about 300 kilometres west of Darwin, Northern Territory, in water depths of more than 100 metres. Both areas are said to exhibit structural geology features similar to the more southerly areas which host the Jabiru and Challis oilfields. The release of this acreage is among the 21 blocks that will be offered this month.

The permit releases coincide with heightened interest in Australia's offshore exploration potential, which is expected to result in a second year of record drilling. The activity has been stimulated by a series of successes off the northwest coast of Australia, and a less punishing tax regime from Canberra.

As well as the Timor Gap permit areas, the blocks made available include five in the Bass Strait and 14 off Western and North Australia.

Bureau of Minerals geologist David Felvey told the 700 delegates at the 31st Australian Petroleum Exploration Association (APEA) conference in Melbourne that the blocks to be released encompassed some of the most interesting and varied potential oil and gas areas around the continent for many years.

Mr Griffiths told the conference that Australia has emerged as one of the world's preferred areas for oil exploration, gaining extra status in recent weeks because of the uncertainty created by the Gulf War. He said the local industry's odds had shortened considerably during the past year due to taxation changes and an improved success rate. The 1991 international new ventures survey of 66 international oil companies by the Robertson Research Group ranks Australia as the fourth most favoured country, and the fourth in terms of exploration expenditure. This represented a jump from 20th in the 1990 survey.

Bass Strait tax may be dropped

Hints were given to the conference that the Federal Government's resource rent tax (RRT) on Bass Strait oil and gas output could be changed in the next few weeks to exempt natural gas and ethane. Victoria's Minister for Manufacturing and Industry Development, David White, said the state had been lobbying hard against the RRT on gas and expected a resolution in the next two weeks. The state was totally opposed to the tax imposed in the 1990 Federal Budget last August, because of the additional costs faced by Victoria's Gas and Fuel Corporation and commercial, industrial and domestic users of gas. The tax on gas was inequitable — it did not apply to the North West Shelf — and would adversely affect the ability of many companies to compete on international markets.

Mr White said he rejected the Federal Government's position that it would be too administratively difficult to exclude gas, stating that Britain had done this when it introduced RRT into the North Sea.

His address was welcomed by delegates, particularly by the Bass Strait partners, Esso Australia Ltd, and BHP Petroleum. Esso has said that it is reassessing four oilfield developments, costed at $A1 billion, in the light of the RRT placed on Bass Strait last year. These fields include West Tuna, Bream B, Yellowtail, South Mackeral and Turrem.

By dropping the RRT on gas, the Federal Government could indirectly assist the reduction in the emission of greenhouse gases from brown coal-fired power stations in the Latrobe Valley, east of Melbourne.

Mr White said the Victorian Government might push ahead with the construction of a gas-fired power station, delaying further extension of its big Loy Yang power stations into the next decade.

An Esso spokesman said a highly efficient combined gas cycle power station would require 50 million cubic feet of natural gas a day, or an increase of 10 percent on the present Bass Strait output.

Several other gas-fired power stations are being considered — in Western Australia, South Australia and Tasmania.

The island state of Tasmania is the only state without a gas supply. Possible development of the Yolla gas field in Bass Strait is under negotiation at a cost of $A500 million. Tasmania would build a modular 250 MW station. Half the projected cost would be spent on an offshore platform and a gas pipeline. If Canberra cuts the RRT on gas for Esso-BHP fields, the joint venture would be able to supply Tasmania from its Longford plant in Tasmania.

The APEA chairman John McArdle said that the oil industry would need about $A30 billion to finance exploration and development in the decade ahead to meet government production targets. He said this level of spending was equal to present annual industry profits over a 33 year period. Such a big effort would only hold production at present levels for another decade.

Attack on Greens

The conference rejected criticism that exploration activities posed a threat to the environment, claiming that it was 'greener' than the greenest conservation movement.

The concerted defence of the industry's environmental record was in response to action by the Greenpeace movement which had claimed that the industry is environmentally bankrupt and controlled by multi-national companies concerned only with profits.

The conference went on the offensive. BHPP has threatened to take court action against Greenpeace for inhibiting its seismic exploration in the Otway Basin.

ORA Ltd group executive Dr Ian Gould said unless a limit was placed on environmental demands exploration and development dollars would dry up.

William Scholes

FORTHCOMING EVENTS

May

6th-9th
Houston, USA: 'Offshore Technology Conference'. Details: Mr F. Herbst, Offshore Technology Conference, PO Box 833868, Richardson, Texas 75083-3868, USA. Tel: (214) 669 0072. Fax: (214) 669 0135.

6th-10th
Singapore: Course on 'Economics and Operations of Bunkering'. Details: The Registrar, The College of Petroleum Studies, Sun Alliance House, New Inn Hall Street, Oxford OX1 2QD Tel: (0865) 250521. Fax: (0865) 791474.

7th-10th
Cranfield: Course on 'Instrumentation Systems for Engineers in the Process Industries'. Details: The Short Course Administrator, Department of Fluid Engineering, School of Mechanical Engineering, Cranfield Institute of Technology, Bedford MK43 0AL. Tel: (0234) 752766. Fax: (0234) 750728.

8th-11th
The Hague: Course on 'Corrosion in the Oil and Gas Industry'. Details: The Center for Professional Advancement, Oudezijds Voorburgwal 316A, 1012 GM Amsterdam, The Netherlands. Tel: 31 20382806. Fax: 31 20202136.

9th-10th
Turin: Conference on 'Safety and Technological Innovation'. Details: CSAO, Corso Massimo d'Azeglio, 42, 10125 Torino — Italy. Tel: 39 11 6508737. Fax: 39 11 6505704.

9th-10th
London: Conference 'Beyond the Crisis: The Gulf in the 1990s'. Details: The Royal Institute of International Affairs, Chatham House, 10 St James's Square, London SW1Y 4LE. Tel: (071) 930 2233. Fax: (071) 839 3593.

13th-14th
London: Conference on 'Satellite Developments in the Offshore Industry'. Details: IBC Technical Services, Bath House (3rd Floor), 56 Holborn Viaduct, London EC1A 2EX. Tel: (071) 236 4080. Fax: (071) 489 0849.

13th-14th
London: 'Tanker '91'. Details Linda McKay, Legal Studies and Services Ltd, Bath House (3rd Floor), 56 Holborn Viaduct, London EC1A 2EX. Tel: (071) 236 4080. Fax: (071) 489 0849.

13th-15th
Singapore: 'Asian Natural Gas III — New Markets and Distribution Methods'. Details: Institute of Gas Technology, 3424 South State Street, Chicago, Illinois 60616, USA. Tel: (312) 567 3650. Fax: (312) 567 5209.

13th-16th
Cranfield: Course on 'Mass Flow Measurement Coriolis and Alternative Methods'. Details: The Short Course Administrator, Department of Fluid Engineering, School of Mechanical Engineering, Cranfield Institute of Technology, Bedford MK43 0AL. Tel: (0234) 752766. Fax: (0234) 750728.

14th
London: Conference on 'The Profitable Forecourt'. Details: Caroline Little, The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR. Tel: (071) 636 1004. Fax: (071) 255 1472.

15th-16th
Oslo, Norway: 'The Sixth European Gas Conference'. Details: Norwegian Petroleum Society, PO Box 1897, Vika, N-0124 Oslo 1. Tel: (47) 2 43 00 50. Fax: (47) 2 55 46 30.

16th-17th
London: Conference on 'CHP: Creating Higher Profits'. Details: Judith Higgins, The Institute of Energy, 18 Devonshire Street, London W1N 2AU. Tel: (071) 580 0008. Fax: (071) 580 4420.

17th
London: Seminar on 'Flammable and toxic gas detection'. Details: Sira Communications Ltd, South Hill, Chislehurst, Kent BR7 5EH. Tel: (081) 467 2636. Fax: (081) 467 7258.

18th-20th
Dijon, France: Symposium on 'Mesozoic and Cenozoic Sequence Stratigraphy of European Basins'. Details: T Jacquin, Centre des Sciences de la Terre, Université de Bourgogne, 6, Bld Gabriel, 21100 Dijon, France. Fax: 80395066.

20th-21st
London: Conference on 'Environmental Issues in Future Offshore Development'. Details: IBC Technical Services, Bath House (3rd Floor), 56 Holborn Viaduct, London EC1A 2EX. Tel: (071) 236 4080. Fax: (071) 489 0849.

20th
London: Meeting on 'Gas in the Single European Energy Market'. Details: Mary Scanlan, BIEE, 9 St James's Square, London SW1Y 4LE. Tel: (081) 997 3707. Fax: (081) 566 7674.

21st
Chester: Course on 'Classification of Hazardous Areas Containing Potentially Explosive Atmospheres'. Details: Sira Communications Ltd, South Hill, Chislehurst, Kent BR7 5EH. Tel: (081) 467 2636. Fax: (081) 467 7258.

21st-23rd
Birmingham: 'Control & Instrumentation Exhibition 1991'. Details: Mr A. Thompson, MGB Exhibitions Limited, Marlowe House, 109 Station Road, Sidcup, Kent DA15 7ET. Tel: (081) 302 8585. Fax: (081) 302 7205.

21st-24th
Dunfermline: Conference on 'Advances in Marine Structures'. Details: Kay Russell, Elsevier Seminars, Mayfield House, 256 Banbury Road, Oxford OX2 7DH. Tel: (0865) 512242. Fax: (0865) 310981.

22nd
London: 'Biotechnology in the clean water industries'. Details: SCI Conference Secretariat, 14/15 Belgrave Square, London SW1X 8PS.

22nd-24th
Birmingham: Conference on 'Environmental Protection, Control and Monitoring'. Details: Alfons Westgeest, ISA International-European Region, 142–144 Avenue de Tervueren, 1150 Brussels, Belgium. Tel: (32) 27350165. Fax: (32) 27365294.

June

5th
Aberdeen: Seminar on 'Subsea Standardisation — Trend for the 1990's'. Details: Subsea Engineering News, PO Box 213, Swindon SN6 8UA. Tel: (079371) 303. Fax: (079371) 433.

Conder's been going over your head for years . . . now we're getting under your feet . . .

1991 Petroleum Retailing Conference

THE PROFITABLE FORECOURT

Tuesday 14 MAY 1991

To be held at the Cavendish Conference Centre, London

Each year the Petroleum Retailing Conference organised by the Energy Economics Group of the Institute of Petroleum provides a valuable forum for retail management from the oil industry, station operators and suppliers of equipment and services from both the United Kingdom and elsewhere in Europe to meet and discuss topics of current interest to the retail petroleum market.

This year the topic will be The Profitable Forecourt, a subject of great concern both to station operators and to their oil company suppliers in the present difficult economic climate. Participants will have the opportunity to hear and discuss the views of three station operators representing the perspectives of different sectors of the market. Other papers will consider the ways in which new developments in forecourt equipment, shop merchandising, Electronic Funds Transfer and overall design and image can enhance forecourt profitability to the mutual benefit of the station operator and his oil company supplier.

The Keynote Address will be given by Mr J Slavin, General Manager, Retail Marketing, Shell UK Oil.

Presentations will be included on:

Operators' Perspectives
The Oil Company Managed Network
The Independent Chain
The Dealer Operated Station

Improving Profitability through Innovation
Profit opportunities from car washing
Forecourt shops – designing to maximise the opportunity
Retail data communications – who pays for yours?

Design for Profitability

For a copy of the registration form 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

Please note that VAT is 17.5 per cent

FORTHCOMING EVENTS

6th
London: Seminar on 'Gas Monitoring'. Details: Sira Communications Ltd, South Hill, Chislehurst, Kent BR7 5EH. Tel: (081) 467 2636. Fax: (081) 467 7258.

10th-13th
London: Course on 'Managing Major Emergencies'. Details: Petroleum Training Federation, Room 326, 162-168 Regent Street, London W1R 5TB. Tel: (071) 439 2632. Fax: (071) 287 5483.

11th-12th
Birmingham: Course on 'Understanding Newer Techniques of Heat Treatment'. Details: Wolfson Heat Treatment Centre, Aston University, Aston Triangle, Birmingham B4 7ET. Tel: (021) 359 3611 ext. 5212. Fax: (021) 359 8910.

11th-12th
Manchester: 'Firex North — Exhibition and Conference'. Details: Caroline Fletcher, Paramount Exhibitions and Conferences, 17–21 Shenley Road, Borehamwood, Herts WD6 1RT. Tel: (081) 207 5599. Fax: (081) 207 2598.

13th-14th
Rome, Italy: Conference on 'Energy Outlook'. Details: Amanda Jenkins, Conference Organiser, DRI Europe Ltd, Wimbledon Bridge House, 1 Hartfield Road, Wimbledon, London SW19 3RU. Tel: (081) 543 1234 Fax: (081) 545 6248.

18th-20th
Birmingham: RoSPA International Safety & Health Exhibition. Details: Glenis Kendall, RoSPA, Cannon House, The Priory Queensway, Birmingham B4 6BS. Tel: (021) 200 2461.

24th
London: Conference on 'Energy Investment — Limiting the Risk'. Details: Mary Scanlan, BIEE, 9 St James's Square, London SW1Y 4LE. Tel: (081) 997 3707. Fax: (081) 566 7674.

24th-25th
Florence: 'European Refining Conference'. Details: Ms Mireia Mangual, Wefa Energy, 60/62 Margaret Street, London W1N 7FL. Tel: (071) 631 0757. Fax: (071) 631 0754.

26th-28th
London: Course on 'Introduction to Oil Industry Operations'. Details: Caroline Little, The Institute of Petroleum.

July

1st-3rd
London: Course on 'Introduction to Petroleum Economics'. Details: Caroline Little, The Institute of Petroleum.

8th-10th
Honolulu: '14th IAEE International Conference'. Details: Mary Scanlan, BIEE, 9 St James's Square, London SW1Y 4LE. Tel: (081) 997 3707. Fax: (081) 566 7674.

8th-11th
Cranfield: Course on 'Pumps in Service'. Details: Short Course Administrator, Department of Fluid Engineering and Instrumentation, School of Mechanical Engineering, Cranfield Institute of Technology, Cranfield, Bedford MK43 0AL. Tel: (0234) 752766. Fax: (0234) 750728.

8th-12th
New York, USA: Seminar on 'Modern Developments in Boiling Heat Transfer and Two-Phase Flow'. Details: Office of Continuing Education, Rensselaer Polytechnic Institute, Troy, New York 12180–3590. Tel: (518) 276 8351.

14th-20th
Warwick: 'Ninth International Conference of Women Engineers and Scientists'. Details: Conference Associates and Services Ltd ICWES9, Congress House, 55 New Cavendish Street, London W1M 7RE. Tel: (071) 486 0531. Fax: (071) 935 7559.

30th-2nd August
Darwin, Australia: Conference on 'Oil and Gas in the World's Fastest Growing Economy — The Timor and Arafura Seas'. Details: Mr B. Jones, Deputy Director, Special Projects and Marketing Division, NT Dept. Mines and Energy, GPO Box 2901, Darwin 0801, Australia. Tel: (089) 89 5295. Fax: (089) 89 5289.

September

4th-6th
Bradford: Course on 'Particle size measurement and sampling'. Details: Dr L. Svarovsky, Reader in Chemical Engineering and Powder Technology, Department of Chemical Engineering, University of Bradford, Bradford, West Yorkshire BD7 1DP. Tel: (0274) 733466. Fax: (0274) 727859.

16th-19th
Oxford: Seminar on fire fighting foam 'Foam System Selection and Design Criteria'. Details: Resource Protection Ltd, Suite 3, Lloyd Berkeley Place, Pebble Lane, Aylesbury, Bucks HP20 2JH. Tel: (0296) 399311. Fax: (0296) 395669.

17th-19th
Birmingham: International Water Exhibition 'IWEX '90'. Details: Paul Tweedale, Turret Group plc, Turret House, 171 High Street, Rickmansworth, Herts WD3 1SN. Tel: (0923) 777000. Fax: (0923) 771297.

18th-19th
Sutton Coldfield: Symposium on 'Offshore Safety and Reliability'. Details: SARSS 91, The Safety and Reliability Society, Clayton House, 59 Piccadilly, Manchester M1 2AQ. Tel: (061) 228 7824. Fax: (061) 236 6977.

20th
Oxford: Seminar on 'Gaseous Extinguishing Agents — Applications and Protection Alternatives'. Details: Resource Protection Ltd, Suite 3, Lloyd Berkeley Place, Pebble Lane, Aylesbury, Bucks HP20 2JH. Tel: (0296) 399311. Fax: (0296) 395669.

24th-27th
Bradford: Course on 'Solid-liquid separation'. Details: Dr L. Svarovsky, Reader in Chemical Engineering and Powder Technology, Department of Chemical Engineering, University of Bradford, Bradford, West Yorkshire BD7 1DP. Tel: (0274) 733466. Fax: (0274) 727859.

26th
London: Conference on 'The Power and Efficiency of Marine Propulsion'. Details: Caroline Little, The Institute of Petroleum.

The UKCS — meeting the challenge

By DC Harding OBE, Chief Executive, BP Exploration Europe

I have been reflecting on my choice of title. Perhaps instead of 'The UKCS — meeting the challenge', it should be 'The UKCS — grasping the opportunity'.

Let me begin by outlining where BP Exploration actually stands in relation to the UK Continental Shelf.

- We are involved in 28 out of a total of some 80 producing fields; we are operators in 14 of those fields.
- In 1990, we produced over 420,000b/d of oil (23 percent of the UK total) and 640 MMSCFD of gas (15 percent of the UK total).
- We have interests in 15 pipeline systems, eight of which we operate.
- We have interests in 22 percent of UKCS licensed blocks, 13 percent on a net acreage basis.
- In addition to an extensive portfolio of UKCS discoveries and pre-projects, we are involved in a number of projects involving a BP spend of around £1 billion this year. These include the Miller oilfield, the Bruce gas/gas condensate field and the expansion at Grangemouth of one onshore oil processing facility. On a non-operator basis, we also are participating with others in the development of East Brae and Pickerill.
- Last year we were involved in 87 well drilling programmes and the initial perception is that we had a highly satisfactory success rate.
- Finally, we employ over 6,000 staff in the UK upstream business.

On the final point, the importance of our industry to the UK economy was underlined by an independent study which we commissioned in Scotland last year. This estimated that when all the multiplier effects are fully allowed for, BP's spend as an Operator led ultimately to an equivalent of 60,000 jobs in Scotland and 125,000 jobs in the United Kingdom. Clearly, if these figures were grossed up for the upstream industry as a whole, we become very significant indeed within the context of the UK economy.

Against that background, let me begin to pick up on a number of interrelated themes which will define the current circumstances and hence the challenge or the opportunity:

Maturity

Up to the end of 1990, some 16 percent of the designated UKCS area had been licensed and around 2,200 exploration and appraisal wells had been drilled. Some 16 billion barrels of oil equivalent (bnboe) has been produced to date, and some 17bnboe remains in proven and probable reserves. While estimates of yet-to-find vary enormously, our own views suggest around 13bnboe. In crude terms therefore, reserves remaining to be discovered are probably around 40 percent of what has been found or produced to date. The old rule of thumb which suggests that 85 percent of reserves in a province are found in the first 15 percent of drilling is no bad guide, and I recently noted a report by Kleinwort Benson which calculated that 89 percent of UKCS reserves have been found in acreage licensed between 1966 and 1972.

Maturity also means that while there are substantial remaining reserves, discoveries are likely to be in smaller and often technically more difficult accumulations. Thus the average size of discovery today — and I am aware of a number of exceptions — tends to be around 50 million barrels: this compares with an average size of around 100 million barrels in the mid 1980s, around 500 million barrels in the mid 1970s and around 1 billion barrels in the early 1970s at the beginning of that decade of discovery.

Herein lies the essence of the challenge of the UKCS. These smaller discoveries, and many existing development prospects, will be expensive to develop on a cost per barrel basis and investment decisions will be finely balanced. We need to develop a small field mentality, and for some of us at least, that is no simple process. And by saying 'some of us', I include operators, non-operators, contractors, service companies, suppliers, and

regulatory authorities, for a new approach to our offshore industry may be necessary.

Maturity in the UKCS, however, is not all a downside factor and I would not want to present it as such. There are a number of positive advantages.

- There is still high value to be realised in the sector against our national background of political stability.
- The industry has a detailed insight into the geology of the area and of operating in the environmental conditions of the North Sea.
- There is a well developed infrastructure of pipelines, terminals and production facilities.
- We have an established and experienced supply industry and workforce, current industrial relations problems notwithstanding.
- Liberalisation of the natural gas market offers some very specific opportunities in a province where gas is becoming increasingly important.

Costs

BP Exploration has recently completed a study on the question of costs — and the results have been quite revealing. The study identified two separate cost effects — oilfield inflation and cost push.

Oilfield inflation is a persistent and underlying real upward pressure on unit costs as a province matures. For example, unit production operations costs in both the UKCS and the United States have increased more or less steadily by about 5 percent each year over and above base inflation for the past 10 years. There may be two principal reasons for this:

The first relates to the natural distribution of hydrocarbon finds. As the easiest and biggest discoveries tend to be made generally first, and certainly developed first, and as size and quality subsequently declines, so unit exploration and development costs increase: these factors are only partially offset by technology and improved skills.

Second is the problem of increasing unit operating costs. As fields come off plateau production, the unit operating costs trend increases due to the high proportion of fixed costs and the increased expenditure required to maintain production — for example, water and gas handling, artificial lift and infill drilling. Additionally, older fields require more inspection, more maintenance and more upgrading to meet new standards, all of which cost

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money and which could lead to a shortening of economic life.

Cost push, on the other hand, represents the rise in upstream costs caused by a sustained adjustment from one equilibrium oil price level to another. Cost push seems to be driven by two main factors:

- Industry activity levels responding to increased oil price or other stimuli and driving up demand levels for finite resources.
- Supply and service companies in the oil industry seeking to share in the increased rent, thus recovering ground lost in the downturn in the second half of the 1980s.

Overall, we calculate that the first factor, oilfield inflation, impacts on operating expenses per barrel produced at between 3–6 percent per annum and on overall oilfield costs at 3–4 percent per annum: for basic cost push we foresee impacts at about 1 percent per annum on production operations, and at 1–2 percent on overall costs.

It takes little stretch of the imagination to realise that both effects are with us in the UKCS today. Province maturity is an established fact, while the effect both of price perceptions and activity levels is equally to the fore. With regard to the latter, one only has to look at the Department of Energy's own statistics on developments. In 1990, Annex B approval was given to 18 developments, compared with 11 in 1989; associated expenditure was £5.3 billion. Beyond that, the department's own survey of investment intentions shows capital expenditure being sustained in 1991 and 1992 at levels of £4.7 billion and £4.8 billion respectively.

The significance of cost pressures, however we define them, is self-evident. They have a direct bearing on our current profitability, on the economics of potential developments — many of which I have already described as being in the marginal category — and on our ability to fund such developments. It is on that note that I will turn to the next part of my framework, namely that of oil prices.

Oil prices

The general perception — certainly in the minds of the public and politicians — is that prices have moved in our favour in the recent past. Assuming, that is, that anyone can make any sense at all of the latest price fluctuations!

In reality, the facts are less straightforward. In 1990 money, the annual average price of oil in 1980/81 was $46 a barrel: over the period 1986/89, it had fallen to an annual average of $16 to $21 a barrel. At no time therefore — even at the height of the latest blip — has the price come near its real level in 1980. Today's price in fact is less than 50 percent of its real level in 1981; in sterling terms the position is even worse. Clearly we need to ensure that these facts are more widely understood and appreciated.

Taxation and funding

It is of course, meaningless to look at the price position in isolation from issues such as taxation and its impact on the availability of funds for future investment.

Investment in more than 50 oil developments in the North Sea took place in the period 1975 to 1985, over which the tax system evolved with Petroleum Revenue Tax (PRT) increasing from 45 percent to 75 percent. As a result of that investment, the companies net cash flow after tax and reinvestment was around £5 per barrel in the first half of the 1980s when the price of oil averaged £30 per barrel in 1990 terms. In the second half of the 1980s, when the price of oil averaged £12 a barrel, net cash flow was only £2 per barrel. In 1986 in fact, the North Sea was a net consumer of cash.

None of this suggests a bonanza but a fairly sombre outcome resulting from investment and a tax system both of which were predicted on the expectation of a higher oil price than that which materialised.

Moreover, and not withstanding the cost increases to which I referred earlier, the mature fields are set under current arrangements to continue to bear a heavy tax burden. A recent study estimates that between 1991 and 1996 seven UK fields are expected to

provide half of government revenue. Over the same period, fields which pay all three taxes (royalty, PRT and Corporation Tax) are expected to account for 40 percent of UK production, but as much as 72 percent of government take.

While the UKCS tax system is attractive in many ways — and has been responsive to certain pressures in the past — we all must be concerned at the burden borne by producing fields and the implication of this for funds flow and future investment. So, let me return later to the question of tax.

Opportunity cost

The UKCS cannot and will not be considered on a purely stand-alone basis by the major companies and this assessment is underlined by the recent upheavals in world geopolitics and shifts in balance of power. Nowadays, neither technical, geographical, or political inaccessibility can be seen as a long-term impenetrable barrier as witnessed by the number of companies including my own, who are in discussions with the old Communist bloc.

It is therefore very much the case that the UKCS is in competition for investment funds with other parts of the world. Certainly, that is the basis on which I am working in submitting my investment approvals. We must always see the UKCS in its world context. The yet-to-find volumes — which are around 15bnboe if we include NGL's — compare with equivalent estimates of 42bnboe for the USA, 170bnboe for the Arabian Gulf, and over 200bnboe for the USSR.

Levers

In presenting these themes and building the framework for considering our challenge, I have touched on a number of pressure points or possible threats to the future of the UKCS. I have also, however, identified opportunities. If we are to retain the UKCS as an attractive investment option relative to other areas of the world, then it is essential that we are clear in our minds as to what we have to do to meet the challenges of maturity. There are a number of levers available to us.

Technology

Technology has a role in all of the following key areas:

- reducing costs
- increasing opportunities
- improving efficiency
- enhancing safety

Technical progress has contributed to all or some of these objectives. Examples include 3-D seismic survey techniques, horizontal drilling, subsea completions, heavy lift capability. The trend to unmanned or minimally manned facilities is another important example, particularly given the all important implications for a safer working environment.

Technology must be applied so as to enhance our operating skills at all levels, extend the safe life of existing assets at an acceptable cost and address the challenge of the economic development of small fields. However, we must not fall into the trap of seeking technical progress for its own sake.

In meeting these objectives, there are a number of related activities which we need to bring into clearer focus. These include:

- The more extensive and productive use of joint venture research projects.
- A better understanding of research priorities and the role of research in achieving operational and developmental objectives.
- Improved cross networking within the industry, both within the UKCS itself, and also across national frontiers.
- We need a better acknowledgement of our collective needs.

Taxation and regulation

I mentioned earlier that the tax system was beginning to bear heavily on relatively few producing fields that this was likely to continue over the next five years or so. At the same time the UKCS has moved towards maturity and costs are escalating.

Unlike geological factors, however, the fiscal system is not an immutable 'given'. If the will and understanding is there, it can be changed and tailored to circumstances. In fact, given that the role of the fiscal system in any province is to capture for the public purse a due share of economic rent — there is a strong case in logic for arguing that the system should be more flexible in recognising and responding continuously to those factors which determine economic rent — particularly with respect to mature fields — and in releasing cash for reinvestment. I do not advocate constant changes but rather a process of evolution in line with the lifetime cycle of the province. It is up to us as individual companies and as an industry to state our case clearly and to make representations regularly and adequately.

We face the obvious difficulty that current high levels of activity militate against change. In these circumstances, it is up to us to draw attention to the underlying fundamentals, to the national economic benefits which arise from our activity and the importance of maintaining momentum in the UKCS.

While on the theme of government's role, let me also briefly mention the importance of regulation and approval. This may also have to change in response to province maturity, for example, in a more relaxed attitude towards phased developments or combined production and appraisal, or in the whole complex area of ring fence determination and incremental investment.

While I believe that there is an increased awareness of these issues within the regulatory authorities — and hence a better appreciation of the difficulties which we face — it is again down to us to state our case with clarity and authority.

Safety

A third, and a key lever, is that of safety — and in placing it third on my list, it is by no means a sign that I regard it as unimportant. The latest Brown Book in Appendix 13 shows that taking incidents on installations and vessels together, there were 248 fatal accidents and 725 serious accidents reported in the UKCS between 1979 and 1989.

We regard these statistics as unacceptable and we are all of us doing everything in our power to bring about a drastic improvement.

I do not see a conflict between safety considerations and the need for greater efficiency and profitability. While safety related work is presently imposing a direct cost to the industry — and therefore feeding directly in to the bottom line — over a longer period, a safe working environment is an essential prerequisite for efficient and profitable working and an even greater impact on the bottomline. This will bear both on our ongoing operations and, indeed, on future projects in which safety can be further enhanced through the application of new technologies.

'We might transform challenge into opportunity'

Our facilities have to be designed and constructed so as to be as safe as is possible. But this will be to no avail unless we simultaneously address the human factor. Thus it is the individual and collective efforts of our management and staff which will ultimately bring about the improvement in safety performance which all of us seek. This point quite simply cannot be over-emphasised.

BP's way

With the cultural changes underway in the BP Group and within my own Glaswegian HQ, we are trying to put an organisation and a behaviourial style in place which will enable us to meet the challenges of a changing world. We aim to be less bureaucratic and more responsive to changing circumstances: we aim to be less hierarchial and to increase personal responsibility: above all, we aim to release the full potential of our most valuable resource — people.

In moving forward in this way and as part of the same process, we have been conscious of a need to look outside our own organisation, and to review the way we related to key external bodies — namely our partners, and our contractors and suppliers.

Conclusion

In my opening remarks I posed the question as to whether the future of the UKCS represented a challenge or an opportunity. Let me now attempt to set out my answer to the question.

I am forced to the view that the UKCS is unambiguously and at the same time both an opportunity and a challenge.

Although most certainly in its mature phase, the UKCS does offer 'a favourable situation' or a 'good chance to do something' — an 'opportunity' according to the Oxford Dictionary. There are substantial reserves yet to be produced and yet to be found: and we have experienced staff both within our own organisations and within the various sectors with which we do business.

But is is simultaneously a challenge. Discovery sizes have been falling in line with the expectations of a mature province, cost push and oilfield inflation effects are amply evident, and at the same time, tax bears heavily on current production.

In order to succeed we must above all contain costs — both as they affect operations and prospective developments. In this context I am talking not of picking around the edges, but more of a quantum leap.

I have identified some of the levers whereby we might transform challenge into opportunity. These included the judicious and effective development and application of technology. But equally important were the human factors — the ways in which we do business and the way we relate one to the other. We have to realise that our collective strength is much greater than the sum of our separate parts — in cooperation lies progress and profits.

Finally, I alluded to the role which government can play in ensuring the continued momentum of the UKCS: this applies both in the fiscal area, and also in the general area of regulation, control and approval. Pressing such a case when the industry is investing on an almost unprecedent scale may give the impression of 'crying wolf' — but then it is up to all of us to make sure that the underlying fundamentals are adequately presented and fully understood. I believe that we can get our act together, and that we can continue to develop the UKCS, both in the interests of our shareholders and in the interests of the UK economy. ■

Acknowledgement
Mr Harding's address was given to the IP Exploration and Production Discussion Group during IP week in February.

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Kuwaiti oil sector: damage and reconstruction

By Naji Abi-Aad, Energy Consultant

Although heavy damage had been done to every sector in Kuwait during its seven-month occupation by Iraqi forces, early assessment indicated that the deliberate sabotage to the oil industry had been the most worrying legacy of the conflict.

Immediately after the liberation of the Emirate in late February, the Kuwait Petroleum Company (KPC) started to implement the first stage of a crash programme for rehabilitating or reconstructing the oil sector. This 90-day 'emergency' period will be followed by a phase of consolidation work which is projected to restore its oil industry over the next five years.

Oil production

As contractors mobilise to start the reconstruction operation under the supervision of Bechtel Corporation, Kuwaiti officials confirm that the damage to the country's oil wells has been worse than expected.

Indeed, a total of about 800 wells in Kuwait and its part of the Neutral Zone were deliberately sabotaged and set alight by the Iraqi forces or by allied bombers. However, most of the wells, especially those at Burgan and Magwa fields, could not burn for very long since output there relies on water drive, and because their low levels of associated gas would make it difficult to keep wellhead fires burning. In addition, most of the Neutral Zone wells set ablaze have already killed themselves because they are on artificial lift. Consequently, the number of wells still burning has been declining, and at the end of March totalled around 500.

Currently, about 6 million barrels of oil are being wasted every day, compared with the pre-invasion 1.8 million b/d production and 2.5 million b/d output capacity. Until the complete extinguishing of fires, oil worth $40 billion could be burned or wasted, reducing the country's oil reserves (estimated at 94.54 billion barrels in early 1991) by 3 to 5 percent.

The pressure decline in the fields and the water contamination caused by the over-rapid flow of oil from reservoirs might require the use of secondary and enhanced recovery techniques. This could increase by fourfold the cost of production which, according to early 1990 estimates, averaged $0.55/barrel.

Iraqi saboteurs had also caused varying degrees of damage to as many as 13 of the 26 oil gathering facilities serving the oilfields. Field storage tanks in the Neutral Zone among others were also badly hit. Their combined capacity amounted to 900,000 barrels including 230,000 barrels in Wafra, 100,000 barrels in South Umm Gudair and 25,000 barrels in South Fuwaris.

Before the invasion, Kuwait had been producing from 12 oilfields with a total of almost 900 wells. This included the five fields and 500 producing wells in the Neutral Zone which is shared equally with Saudi Arabia. On the Kuwait side of the Neutral Zone onshore operations are undertaken by the Wafra Oil Company, whereas the Arabian Oil Company of Japan is the operator offshore.

The main producing structure in Kuwait had been Burgan field which in July 1990 accounted for more than half of the producing wells. Its pre-invasion output capacity was estimated at 1.5 million b/d, whereas Raudhatain and Sabiriyah fields had a combined capacity to produce half a million barrels daily.

Another 400,000 b/d had been available from the Neutral Zone. The Khafji field produced half that total from around 165 wells. Another four oilfields, two onshore and two offshore, were responsible for an aggregate output of 200,000 b/d.

The most urgent requirement for KPC is to regain control of the sabotaged oil wells, some 500 of which are also burning. This operation, coordinated by the American company, O'Brien Goins and Simpson, will first require that the oil producing areas be cleared of mines and booby traps and will need huge amounts of cooling water and explosives as well as various

types of special equipment. Consequently, it is likely to cost many millions of dollars to regain control of all the wells, although it is hoped to have most of them under control within the next 12 months.

After sufficient wells are back under control and any fires involved have been put out, KPC's second priority will be to increase the current 50,000 b/d output, in order to feed power plants and enough refining capacity to stop the need for product imports. The target for the fourth quarter of 1991 is set at around 150,000 b/d.

By mid-1992, the government hopes to reach an output of 500,000 b/d, mainly from fields in the north (Raudhatain and Bahra). In addition the country's share in Neutral Zone production is expected to resume this month. At any rate, normal production from all fields at over 2 million b/d may not be possible before late 1993 or early 1994. This could require drilling around 500 new wells, each costing an average of $2.5 million.

Refining

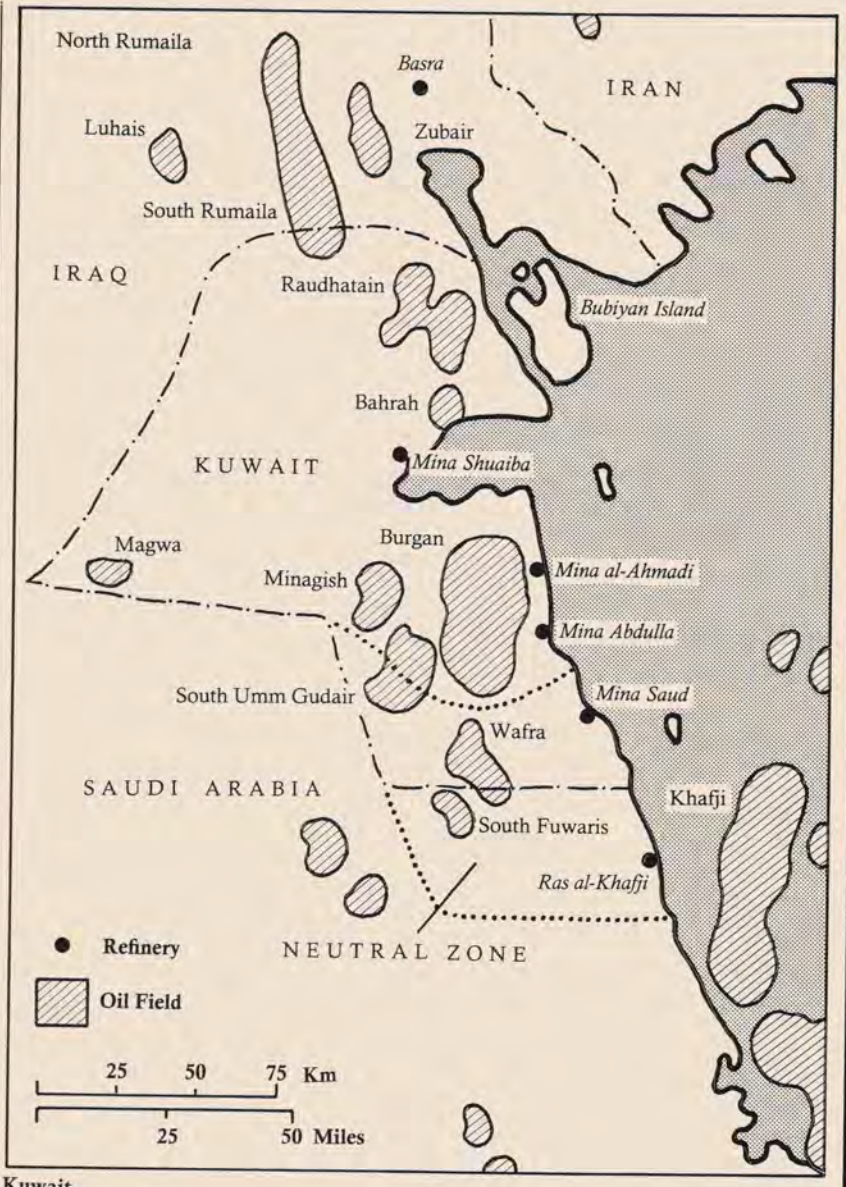
KPC also needs to reconstruct and rehabilitate the country's three refineries, namely Shuaiba (200,000 b/d), Mina al-Ahmadi (300,000 b/d) and Mina Abdullah (220,000 b/d).

According to industry reports, the Shuaiba refinery was badly damaged by Iraqi sabotage. Located on the outskirts of Kuwait City, the refinery processing units and control equipment were systematically looted, its crude and gas feeding systems destroyed and nearly all its storage tanks heavily burnt.

At the Mina al-Ahmadi refinery, the 13 million-barrel tank farm was damaged and much of the plant's $100-million ancillary facilities were stolen or damaged.

The Mina Abdullah plant was stripped of its process control equipment and inventory of spare parts, but only received damage to its tank farm. Like the other two refineries, the plant consisted of complex units installed during an extensive modernisation programme in the second half of the 1980s.

According to Kuwaiti officials, only about 20 percent of the three plants' 720,000 b/d capacity was directly damaged. However, this year, KPC will not be able to process domestically more than 130,000 b/d, mainly in Mina al-Ahmadi where work has already started to restore crude oil flow. Only after concentrated and costly repair work, could about 500,000 b/d of refinery capacity be usable by the end of the year or in early 1992.



Kuwait

Oil exports

The final stage of the reconstruction programme is the restoration of crude oil exports. KPC will need to repair the damage to the three export terminals, and pipeline network connecting them to oilfields and refineries.

The most damaged oil terminal has been Mina al-Ahmadi's Sea Island which, together with certain pumping facilities, was destroyed by allied bombers to stop the discharge of crude oil by the Iraqis into the Gulf.

Before the invasion, the terminal at Mina al-Ahmadi consisted of two piers in addition to the Sea Island. The 'T'-shaped South Pier runs seaward for 1.3 km with eight crude berths, whereas the North Pier, 5.6 km north of the southern one, had four berths. Sea Island, 12 km east of the piers, had two berths handling vessels of up to 326,000 dwt. Crude oil was fed to the Sea Island by a 48-inch submarine pipeline to four arms, each loading at a rate of up to 19,500 tons/hour. A single point mooring (SPM), located 2.4 km east of the Sea Island was equipped with three strings of floating hoses, two 16-inch strings for crude loading and one 12-inch string for bunker loading.

The terminals at Mina Abdullah and Shuaiba were also hit by the hostilities, though not seriously. Mina Abdullah terminal to which crude was fed by pipelines from the Raudhatain, Minagish and Burgan fields, consisted of two oil loading berths which can accommodate tankers of up to 150,000 dwt. The terminal at Shuaiba, serving the refinery nearby, had four petroleum product berths, loading vessels of up to 70,000 dwt. ■

Gulf War sequel: Asia Pacific speeds exploration

By WA Scholes

The Gulf War has further boosted the growing trend towards greater exploration activity in the Asia Pacific region and has accelerated the move towards diversification of petroleum supplies and downstream products by countries of the region.

Most countries in the Asia Pacific region are now offering improved contract terms or permits. Australia offers incentives for increased exploration, New Zealand is considering new petroleum legislation to attract international companies, and Papua New Guinea is currently enjoying an exploration boom in frontier areas under its user-friendly tax regime.

Australia's Federal Resources Minister, Alan Griffiths, claims the new incentives for offshore exploration offered by his government have brought 16 new international companies to bid for permits in Australian waters.

Exploration blocks for the Timor Sea Area A Zone of Cooperation (ZOC), a joint development area between Indonesia and Australia, are expected to be offered before the end of this year. Estimates of the oil or gas potential in the ZOC run as high as 7 billion barrels of oil or gas equivalent. However, only 20,000 line km of seismic and five exploration wells have been drilled in there but discoveries in the adjacent Timor Sea blocks under Australian control make the ZOC highly prospective.

New Zealand, too, is releasing more exploration permits. John Luxton, the new Energy Minister, recently released 13 petroleum prospecting licences covering Taranaki, Northland and the Wanganui basins. The successful bidders included BP Development, Sun Oil New Zealand, the Petrocorp-Shell-Todd consortium, Albion International Resources, Aberdeen Petroleum, Pacific Star Resources, American New Zealand Exploration Co, and JFP Energy Inc, a company which has been associated with exploration in New Zealand over the past five years.

Expenditure on offshore petroleum exploration and development in Australia in 1991 could top $A1.4 billion, according to the latest activity survey by the Australian Petroleum Exploration Association (APEA). The APEA report forecasts expenditure on offshore petroleum exploration in 1991 of $A330–547 million, compared with $A70–92 million onshore. Between 43 and 62 offshore wells will be sunk in 1991, of which as many as 55 would be wildcat, the balance being appraisal wells.

APEA's executive director, Keith Orchison said: 'What's driving our exploration effort at the moment is the discovery rate.' Last year saw a number of significant commercial discoveries off the northwest coast of Western Australia. These may contain more than 300 million barrels of oil between them. Mr Orchison said that rights to a large number of permit areas would soon expire, compelling the permit holders to undertake drilling programmes in order to decide which parts of their areas to relinquish.

Another factor which points to more active exploration is the federal budget changes made to the resources rent tax regime applying to offshore exploration. However, Mr Orchison said these changes, which included wide deductability for exploration expenditure, were yet to be legislated for and would take some time to affect the industry. 'We would hope that in 1990–91 we are building a foundation from which exploration will increase to a very large extent,' he said.

Oil and gas exports have joined the ranks of coal and iron ore as top revenue generators. APEA predicts that the Australian petroleum industry will earn $A2.47 billion from exports in the year to 30 June, putting it close to the wool industry which is expected to earn $A2.9 billion. This will make the petroleum industry the seventh largest commodity exporter, after coal, gold, wool, wheat, iron and steel and meat.

'Australia is currently 80 percent self-sufficient in petroleum'

Australia is currently 80 percent self-sufficient in petroleum requirements and the Federal Government policy is to maintain the highest level of self-sufficiency, getting away as far as possible from reliance on Middle East supplies.

Southeast Asia

An estimated 60 percent of the world's population lives in the Asia Pacific, a population of more than 3 billion. It is estimated that for every point of growth in GNP, the region needs an increase of about 0.8 percent in energy demand. Southeast Asia is currently reporting the highest economic growth rate in the world.

The Asia Pacific oil demand is projected to expand at an average of 3 percent a year, with South Korea,

Taiwan, Thailand, the Philippines, India and Pakistan likely to grow above the region's average, while Singapore and Malaysia will be lower than the average due to oil substitution by natural gas.

The Gulf War has given further impetus to the proposed ASEAN pipeline, a $10 billion project to harness the region's resources for the benefit of all member countries.

Exports from the main Asia Pacific oil producers, such as Indonesia, China, Malaysia and Brunei, could expand from the current exports of 1.8 million b/d of oil when the new exploration discoveries are developed.

The region's dependence on Middle East countries for oil imports is at present 73 percent of total demand or 12.7 million b/d.

Brunei

Brunei Shell produces oil at the rate of 150,000 b/d from onshore Seria and Rasau oilfields; offshore South West Ampa, Fairley, Champion and Magpie fields. All the production reaches the Seria dehydration plant (capacity 240,000 b/d) and is exported through the terminal. Elf-Aquitaine/Jasra plan to develop the offshore Brunei Blocks A & B oil discoveries this year. It is planning to drill more wells.

With a little more than two years left to run in Brunei Darussalam's 20-year LNG sales agreement with Japan, the eyes of the international gas industry are turning toward the sultanate. The sales contract, covering the export of five million tons per year of LNG, is the first in a series of contract renewals that will be negotiated in Asia during the 1990s.

Preliminary discussions will start at a time when high international oil prices and uncertainty in the Gulf are forcing Japanese importers to step up efforts to secure oil and gas imports from non-Gulf sources.

Brunei Shell Petroleum and four affiliated companies handle Brunei's LNG trade at present. Brunei Shell Petroleum is responsible for exploration and production of oil and natural gas, along with refining and crude oil trading. A second company, Brunei LNG, is concerned with liquefying the gas it buys from Brunei Shell Petroleum.

Malaysia

With half of Malaysia's recoverable oil reserves, Terengganu now produces 61.7 percent of the country's crude oil output. When Petronas Carigali's Dulang offshore oilfield off Terengganu goes into production this month, Terengganu's contribution to oil production is expected to reach 65.5 percent.

Malaysia has estimated recoverable oil reserves of 2.94 billion barrels of which 1.46 billon barrels are located offshore. In 1989 Malaysia's crude oil production averaged 560,000 b/d. The 1990 target was set at 595,000 b/d, but since the Gulf War the government has revised the target to 605,000 b/d, and again to 640,000 b/d, responding to urgent requests for oil from Bangladesh, Pakistan and the Phillippines. Since the Malaysian government revised the profit sharing contract terms, foreign companies have honed in on offshore Malaysia.

Whereas in 1985 only EPMI and Petronas Carigali were operating offshore Terengganu, seven oil companies now operate.

These are Home Oil (PM 2) (now taken over by Lasmo Oil of Canada); International Petroleum Ltd. (PM 3) (Hamilton Oil has since taken over the block); Esso Production Malaysia Inc (PM 5 and PM 8); Western Mining Corp (WMC) of Australia (PM 7); Petronas Carigali (PM 6 and PM 12); Japex/Taiyo Operating Co (PM 10) and Texaco Exploration Penyu Inc (PM 14). EPMI also hold important producing acreage under a 1976 profit sharing contract.

The bulk of Terengganu's production comes from EPMI's operation. The company's contract areas have proven reserves of 1.27 billion barrels of oil in 13 oilfields, including the Dulang field which is operated by Carigali under a unitisation agreement. Esso operates currently 24 production and two compressor platforms in 12 oilfields off Terenggau's coast.

Petronas, the state-owned oil corporation, will offer blocks in Malaysia's 10,000 sq km deep water offshore areas in the middle of this year. Areas with a depth of more than 200m are considered deep water. According to Petronas President, Tan Sri Azizan Zainul Abidin, some improvement in the terms of the production sharing contracts for the deep water areas will be made. Petronas is also considering additional incentives for deep water exploration.

Crude from offshore Terenggau is transported via a network of subsea pipelines to a pumping station at EPMI's Tapis field. Crude is then pumped to shore via a 24 inch, 77.5 km pipeline to the Terengganu crude oil terminal at Kertih.

Petronas Carigali's contract areas have proven reserves of 193.1 millon barrels of oil. First production from the Dulang oilfield will be in the range of 20,000 to 30,000 b/d. Five other smaller oilfields discovered by Carigali have not yet been developed.

Petronas Carigali also operates the Duyong gas field, which went on stream in 1985. This field, together with the associated gas from EPMI's fields, supplied all gas requirements under Stage 1 of the Malaysian Peninsular gas grid. Several companies have reported finds, with EPMI indicating that its Larut discovery may be significant. Larut, located 250 km offshore Kuala Terengganu, is in block PM 5, one of two blocks EPMI won in 1988. Production tests at Larut-1 flowed more than 3,000 b/d at depths between 1,650 m and 1,980 m below sea level.

'The Asia Pacific region promises to be the world's busiest offshore area'

China

China forecasts its offshore oil production will rise to eight million tonnes a year by 1995, and 11 oilfields going into production over the next five years. China's offshore oilfields produced only 1.2 million tonnes last year but, with the South China Sea's Huizhou 26–1 and Weizhou 10–3N fields expected to come on stream this year, annual capacity is set to reach 1.8 million tonnes.

The announcement came as United States-based Amoco Corp signed a supplementary agreement with the China National Offshore Oil Corp (CNOOC) to develop further China's biggest offshore field, Liuhui 11–1, south of the Pearl River delta.

The agreement calls for a total investment of about $500 million and production is expected to start in 1995. With the crisis in the Gulf reaffirming the need for diversified origins of supplies of oil, nearly all the world's leading oil companies are again taking a long, hard look at China.

This is despite the fact the initial oil rush of the early 1980s yielded only small deposits of relatively heavy

crude. British Petroleum is drilling a well in Bohai and hopes to sign a number of exploration contracts for fields to the southeast of Hainan Island.

ACT, the Italian-US consortium, is operating in two oilfields, Huizhou 32–2–2 and Huizhou 21–1, located due south of the Pearl River delta, and hopes to bring Huizhou 26–1, with an expected annual capacity of 1.3 million tonnes, on line by the end of this year.

Australia's BHP Petroleum has signed a joint agreement to study two potential oilfields in Bohai. China has also granted the first licence for a foreign oil company to prospect inland.

A consortium headed by New Zealand's Petrocorp Exploration acquired the right to drill for oil in a 15,900 sq km site in the Dongting Basin. This is in part of the East China Rift System. Oil companies have been looking at potential inland sites in 10 provinces for some time.

Apart from the three main existing fields, Daqing, Shengli and Liaohe, which rely on antiquated equipment to extract a rapidly dwindling supply of oil, the only big source of inland oil is in the remote northwestern region of Xinjiang.

In February, China announced the discovery of an oilfield in Xinjiang's Turpan-Hami Basin which was said to be 1.5 times the size of Taiwan and the region has now become the focus of the country's exploration for the 1990s.

Japan aims to diversify feedstock supply

BHP Petroleum has been approached by one of Japan's major petrochemical companies to supply natural gas condensate from the North-West Shelf project under long-term contract, the first step to diversify Japan's sources of feedstock supply. It is the first time that a Japanese company has moved to lock in supplies of condensate, an alternative to naphtha as a basis for plastics production.

The approach to BHP by Mitsui Petrochemical Industries is a part of a plan to diversify dramatically its raw materials sources and end its heavy dependence on naphtha supplies from the Middle East. A Mitsui spokesman said the company would raise the level of LPG and condensate used from 5 percent of total feedstock to 10 percent by the end of the year and to 40 percent by 1993.

But Australian condensate producers would have to follow the lead set last year by Santos Ltd, to convert condensate into naphtha before export. This is because of the recently imposed surcharge of $2.50 a barrel on all Japanese imports of either crude oil or condensate. The surcharge does not apply to naphtha.

Condensate from the North-West Shelf project, operated by Woodside Petroleum Ltd, is prized by the Japanese as a potential replacement for naphtha. However, the North-West Shelf project does not have the infrastructure to export its condensate as naphtha. Condensate production will increase substantially when the second platform is brought into production in 1993 utilising gas from the Goodwyn field. Woodside's Managing Director, Charles Allen, said the question of condensate sales under long-term contract was not yet being pursued as a firm proposal.

However, delegations from Mitsui Petrochemical and another Japanese petrochemical manufacturer recently visited Australia seeking supplies from Australian producers.

Both Mitsui and another company, Showa Denko, have been making spot market purchases since naphtha prices soared after the invasion of Kuwait but this is the first move to secure long-term supplies. Other major producers are expected to follow.

The Japanese government is pressing the industry to diversify its raw materials away from naphtha and toward LPG and NGL and to find sources of supply outside the Middle East. A significant shift by the Japanese petrochemical industry towards condensate will be a valuable expansion of the export market for the North-West Shelf project, which will peak at more than 80,000 barrels of condensate a day.

The North-West Shelf gas project could be expanded to include production of liquid petroleum gas in addition to its large-scale liquefied natural gas exports to Japan.

The LPG option has been under almost continual consideration by the Shelf project partners, since the project was originated more than a decade ago. The sale of LPG was a primary consideration in the early planning stages of the project but a detailed study of the early gas reserves caused the partners to defer any decision to include LPG in the initial development phase.

Now that LNG exports are rapidly building towards their peak, the partners are again seeing how to create additional revenue from the reserves within the project.

One option again under consideration is LPG. But the six North-West Shelf project partners must ensure that any decision to produce products from known reserves contained within the project fields does not interfere with its ability to honour its long-term LNG supply contracts with the Japanese buyers, as these contracts remain the project's single most important lifeline.

The Japanese buyers have spent almost as much money in building receiving terminals and facilities to handle the Shelf's LNG as have the Australian partners to supply the LNG. To extract the butane and propane, which form the major constituents of LPG, could leave the remaining gas stream vulnerable to variations in the specifications demanded by the Japanese LNG buyers.

Stripping the LPG from the gas may also mean altering the way in which the gas fields are managed and in the way hydrocarbons are extracted from those fields.

The gas from the North Rankin gas field is unusually dry or free of gas liquids which produce the LPG components. But the Goodwyn gas field, which will come on stream in 1993, contains far more liquid hydrocarbons, thus making the extraction of LPG more viable.

The recently discovered Wanaea oil-and-gas field contains large volumes of LPG which may become available to the partners for export. Japan offers the potential for vast sales of Australian LPG, given that LPG is such a widely used fuel source for domestic cooking, heating and industrial use. Australia already exports LPG to Japan from Bass Strait and from the South Australian facilities in the Spencer Gulf operated by Santos Ltd.

China has already earmarked large sums for oil exploration in the Tarim Basin during the next five years but it is clearly not confident of raising all the needed funds. The oil companies' new enthusiasm for Chinese oil is also tempered. The key problem remains verifying the government's claims that huge deposits of economically viable oil actually exist.

CNOOC plans to boost exploration and development of offshore petroleum resources by opening blocks to foreign oil companies in the South China Sea and in the East China Sea. China has signed a total of 59 profit sharing contracts since 1978 — currently 29 of them are in operation in its continental shelf.

Texaco and CNOOC signed a joint geological study to access hydrocarbon potential in the area east of Bohai Bay.

Indonesia

Indonesia is projecting an increase in production, exports and imports of crude oil and related products, according to Faisal Anda'o, the head of the state oil company, Pertamina. He told a parliamentary hearing in Jakarta that crude production would increase from 1.36 million b/d in fiscal 1990–91, ending on 31 March, to 1.54 million in 1991–92. Condensate production, however, was likely to drop to 164,000 b/d in 1991–92, compared with the current 179,000. Exports of crude and condensate were expected to increase from the present 796,660 b/d to 849,420 b/d in 1991–92. Exports of oil products, including naphtha, benzene and paraxylene, are also expected to increase from the present year's 54.38 million barrels to 60.12 million barrels in the coming fiscal year. (See *Petroleum Review*, April 1991).

Indonesia formerly imported oil from Iraq, before the UN trade embargo. Imports of petroleum products, mainly from Singapore, are also expected to rise slightly from the present 20.2 million barrels to 21.44 million barrels in the coming fiscal year, the oil official said.

Indonesia plans to build additional LNG capacity to meet the rising demands within the Far East region.

Pertamina is aggressively marketing projects for additional sales to its current customers in Japan, Korea and Taiwan for shipments beginning in 1994/95.

Japan's MITI recently raised its projections of Japanese demand for LNG by the year 2000 to 46.3 million tons per year. This is 13.5 million tons above 1988 consumption and 8.3 million tons per year increase over the previous forecast for the year 2000 made by MITI in 1987. Higher demands are also expected from Taiwan and Korea.

LNG plant, North West Shelf project

Expansion to a sixth and possibly a seventh LNG processing train at PT Badak, Indonesia's LNG complex at Bontang, East Kalimantan, is likely.

Whether the other current LNG facility, PT Arun, located in Aceh province of northern Sumatra, will also be expanded by one or two additional trains and/or a new grassroots facility established nearer gas fields in the South Natuna Sea is currently under consideration by the Indonesian government. Its goal is to extend existing sales contracts and sign six million tons per year of new long-term contracts to increase LNG production to 26 million tons per year.

A key factor in future gas developments will be the development of the country's largest known gas resource located off Natuna Island in the South Natuna Sea.

Estimates of Indonesian recoverable oil reserves vary between 6 billion barrels and 22 billion barrels. Pertamina has signed 14 profit sharing contracts this year and expects to sign another eight before the end of this year, against a total of 19 in 1989 and 10 in 1988. As a result of these contracts, a substantial increase in exploration drilling activities during the next three years (number of exploration and appraisal wells expected to increase to about 190 in 1993) are forecast. Pertamina has extended current profit sharing contracts to Conoco, ARCO, Maxus, Total, Caltex, Tesoro, Mobil, Stanvac, Asamera and PSC.

Pertamina is also planning to offer more exploration blocks in the next two years in areas such as offshore western Sumatra, Natuna Sea, Java Sea, onshore south Java, south Kalimantan, south Sulawesi, Irian Jaya and Riau-Sumatra. Pertamina is also placing emphasis on enhanced oil recovery to obtain an increase in oil production. Britain has given Indonesia about $10 million for oil and gas research aimed at assisting these studies.

Busy search

Based on the number of new platforms planned for new offshore field developments, the Asia Pacific region promises to be the world's busiest area. Some 299 new platforms are planned within Asia/Australia regions out of a total of 703 platforms. This represents 42.5 percent of all platforms planned for construction up to 1995.

Already identified are 718 new potential offshore fields world-wide, excluding North America, which are planned for development to 1995. These fields incorporate a total of 703 platforms, 487 subsea completions and 21,806 km of subsea pipeline of at least 6-inch diameter.

The Asia Pacific is the second most active area of the world for new offshore developments with 229 fields identified. Europe leads with 265 developments and Africa is third with 102 fields.

The Asia Pacific incorporates India within the study and the most active countries with planned field development are: Malaysia with 52 fields, India 41, Australia 36, Indonesia 35, China 29, Thailand 13 and Brunei 12. ■

New technology centre opens in Aberdeen

By Dr David Curry, Managing Director, The International Drilling and Downhole Technology Centre, Aberdeen

Maximising hydrocarbon extraction while minimising field development costs is critical to the long-term future of the oil and gas industry. Advances in developing new and innovative technology will be fundamental to this future but in order to secure these, the correct facilities must be available.

In 1988, the Scottish Development Agency's (now known as Scottish Enterprise) Oil and Gas Group developed the concept of an offshore technology park where at least 80 percent of the industry's R & D needs could be catered for.

The International Drilling and Downhole Technology Centre (IDDTC) is a new facility on offer at Aberdeen's Offshore Technology Park since January. It is the only open-access centre in the United Kingdom which can provide a rig and wells which have most of the features likely to be found in North Sea wells both now and in the foreseeable future.

IDDTC already has a high-pressure vertical well and large diameter hole complete and fully operational. Drilling on a horizontal well is likely to start later this year.

The most visible of the centre's facilities is the United Kingdom's largest land rig, a unit which provides capabilities which match those seen in both fixed and mobile offshore drilling rigs. Rated to 25,000ft with a 2,000 HP drawworks and two 1700 HP mud pumps, the rig has a static hookload capacity of 1,600,000lbs and 10,000psi rated well control equipment.

Rig instrumentation is state of the art. A digital driller's console provides remote data display with the real benefit of logging all drilling parameters for subsequent analysis by the client. Installed on skid rails, the rig can be moved over any of the existing wells or indeed, can drill additional wells should they be required.

The high pressure well has the capacity for downhole fluid injection, making it particularly suitable for the study of kick development and for testing well control equipment and techniques.

With a usable depth of 4,700ft, the high pressure well has 14″ casing and fully retrievable $9\frac{5}{8}$″ casing hung inside the 14″ casing. A 1″ coiled tubing line runs down the annulus and is ported into the $9\frac{5}{8}$″ casing through a full-drift injection sub. A retrievable plug seals the $9\frac{5}{8}$″ casing. If pulled, this allows fluids to be circulated down the annulus and into the $9\frac{5}{8}$″ casing. Together with the coiled tubing this offers a wide range of possibilities for simulating kicking or producing wells. Two permanent surface read-out pressure and temperature gauges are installed, one at 4,700ft just below the coiled tubing injection port and one at 2,320ft. Bottom hole pressures in excess of 12,500psi are achievable.

The large diameter hole is 300ft deep, with $18\frac{5}{8}$″ diameter casing set at 264ft. Destined to become the top hole for the horizontal well, a large diameter hole serviced by a powerful rig is proving a valuable addition to the centre's range of facilities. Already it has been used for cutting casing equipment and further utilisation is planned with new wellhead equipment. The horizontal well is likely to be redesigned to retain the benefit of a large diameter upper section.

Once drilled, IDDTC's horizontal well should be the first open access well of its type. There is a clear call for testing under operating conditions the new completion and production equipment and techniques demanded by horizontal wells.

In addition to the rig and wells, the centre is able to offer a range of support equipment including a cement pumping unit, wireline unit and wireline mast. The workshop and office building houses two client workshops and a 20-seat conference room.

Various facilities

The centre functions principally by providing its facilities to clients for them to use in developing, testing and demonstrating oilfield equipment for a wide range of applications, including:

- Drill bits
- Directional drilling
- MWD
- Kick detection and well control
- Surveying
- Electric logging, especially production logging
- Completion operations
- Casing cutting and milling
- Wireline operations
- DSTs
- Production operations
- Coil tubing operations
- Gas lift
- Electric submersible pumps

There is real scope for 'dry run' testing of services or operations to test whether they can be performed successfully under operating conditions. Within three days at the centre, one operator discovered a readily resolved equipment problem that could have caused 24 hours rig downtime offshore. The client estimated that downtime would have paid for at least 15 days testing at IDDTC, so the cost benefit

was clear. One day of downtime or lost production offshore can pay for weeks or months of testing.

From time to time IDDTC will also offer for sponsorship multi-client projects to address specific topics of interest to the industry. A DEA(E) project is currently being discussed that will test drilling fluid lubricants under operating conditions but with a control of variables that is unattainable in the field.

As well as providing an environment for new technology development, the facilities also have a niche role to play in training — particularly in well control. The centre will not be running training courses but the facilities are amongst the best in the world for 'hands on' well control experience and it is hoped that the existing training schools can make full use of this opportunity.

Funding

The budget cost of establishing IDDTC was £8.7 million, which has been secured from the public sector, oil

David Curry

operator and service and supply company pledges.

The Scottish Development Agency made a £750,000 donation and made available £1.6 million as a loan on preferential terms. Grampian Regional Council has donated £500,000 and also provided the land for the entire Offshore Technology Park.

Oil companies supported IDDTC in two ways, either by making donations of cash, equipment or services, or by sponsoring research to be conducted during the drilling of the wells. Service and supply company support came almost exclusively through the provision of equipment or essential services free of charge, or at greatly reduced prices.

The IDDTC is a wholly independent company. Its independence guarantees commercial confidentiality at all times. As a limited-by-guarantee company, any profit made by IDDTC must be reinvested to improve and extend the facilities on offer.

It was originally intended that the Offshore Technology Park would act as a catalyst towards research and development of new and innovative technology. This is now being achieved, particularly in the case of the IDDTC. During the last two months, the centre has been used for 12 days per month by a range of operators and service companies, illustrating the growing awareness of its facilities. ■

Institute News

New Members

Airey, Ms EP, 4 Milner Place, London N1 1TN.
Alexander, JF, Consul, 60 Inglefield Street, Glasgow G42 7AT.
Al-Qahtani, H, Saudi Aramco, PO Box 4218, Ras Tanura Najmah, Saudi Arabia.
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Armstrong, GWA, 43 Broomhill Avenue, Aberdeen AB1 6JL.
Asante, J, Caleb Brett Int, East Saxon House, 27 Duke Street, Chelmsford, Essex CM1 1HT.
Bale, MP, Shell Companies of Indonesia, SW 193030 Centre, PO Box 2634, Jakarta 10001, Indonesia.
Barber, IT, 40 Elmcroft Place, Westergate, Chichester, Sussex.
Barber, TL, 4 Beales Lane, Walton Park, Milton Keynes MK7 7HB.
Batson, PE, 10A Hollywood Lane, Wainscott, Rochester, Kent.
Bushby, RD, Tile Kiln, Tile Kiln Lane, Uxbridge, Middx UB9 6LU.
Carver SS, SGS Dubai SA, PO Box 12993, Dubai, UAE.
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Dolman, A, 22 St Daniels Drive, Pembroke, Dyfed SA71 5QQ.
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Green, EE, PPQC — Shipping Section, PHRC Ltd, Nigerian National Pet Corpn, PO Box 585, Rivers State, Nigeria.
Greenfield, Z, Vice President Crude Oil & Products, Delek the Israel Fuel Corp Ltd, 6 Prof Kaufman Street, PO Box 50250, Tel Aviv 61500, Israel.
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Heus, R, 19 Tennyson Avenue, Twickenham, Middx TW7 4QX.
Hilldrup, RW, Brown & Root Vickers, 150 The Broadway, Wimbledon, London SW19 4DG.
Johns, CE, Sun International E & P Co Ltd, Sun Oil House, 80 Hammersmith Road, London W14 8YS.
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King, HC, 49 Copthorne, County View, Luton, Beds LU2 8RL.
Laws I, 32 Killingworth Drive, High Barnes, Sunderland, Tyne & Wear SR4 8QN.
Macapagal, Dr C, McDermott Int'l Inc, PO Box 3098, Dubai, UAE.
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Miller, KJ, 32 Redwing Lane, Gateacre, Liverpool L25 4RX.
Murray, PF, 18 Luffness Gardens, Tullcross, Glasgow G32 8DB.
Olorounfemi, MA, Director, Research Divn, OPEC, Obere Donaustrasse 93, 1020 Wien, Austria.
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Small, Dr J Jr, 2 Brendon Close, Esher, Surrey KT10 9EH.
Summerland, SC, Suite 3, Mount Liell Court (East), The Leas, Westcliff on Sea, Essex SS0 8HH.
Trowsdale, NM, 97 Windsor Drive, High Wycombe, Bucks HP13 6BQ.
Veger, R, Petro Survey Assistance, Houttuinen 31–33, 3311 Ce Dordrecht, Netherlands.
Welch, P, 108 Stanford Avenue, Brighton, East Sussex BN1 6FE.

Institute News

New Collective Member

Romcontrol SA is an independent inspection company operating in Romania (or in other countries on request) engaged in the quality and quantity control of imports and exports or goods in transit. This covers the assessment of quantity, the control of loading or discharge operations and of transportation, and the handling and storage of product. Other services include laboratory analysis, expert appraisal, engineering consultancy and tender evaluations. Its work is conducted according to international standards and best industry practice.

Romcontrol SA has a long experience in superintending the inspection of crude oil and petroleum products. It surveys all aspects of the loading or discharge of cargoes, including the vessel and shore terminal, in order to identify and minimise possible cargo losses.

Romcontrol SA has its own fully equipped laboratories for performing the analysis and testing of petroleum and petrochemical products.

Around the Branches

Aberdeen
14 May: 'North Sea safety' paper to be presented by the Department of Energy.

London
22 May: 'Analysis of crude oil transit losses' by Captain D L Smith, Shell Marine.

Shetland
14 May: 'Alternative Energy', Shetland Hotel.

Southern
16 May: Visit to BP Wytch Farm.

South Wales
16 May: Visit to British Airways Nantgarn Works.

West of Scotland
12 June: Golf Match.

Annual survey of the average lead and sulphur contents of petroleum products delivered into the UK market in 1990

	Petrol lead content (grams/litre)					Sulphur content (% mass)						
				Premium motor spirit								
	2-Star	4-Star	Un-leaded	Leaded	U/leaded	Regular kerosene	Aviation kerosene	Auto diesel	Gas oil	Fuel oil (1) Light	Medium	Heavy
1986	0.141	0.142	—	0.04	—	0.04	0.01	0.21	0.27	1.8	2.0	2.1
1987	0.140	0.142	—	0.02	—	0.06	0.04	0.22	0.29	1.7	1.8	2.1
1988	0.138	0.143	0.002	0.04	—	0.03	0.03	0.19	0.25	1.4	1.8	2.0
1989	—(2)	0.143	0.002	0.05	0.03	0.04	0.03	0.19	0.21	1.8	2.2	2.2
1990	—	0.143	0.002	0.05	0.04	0.04	0.03	0.19	0.21	1.7	2.0	2.2

Based on weighted average figures provided by UK Petroleum Industry Association.

(1) Fuel oil figures exclude deliveries for export, bunkers and public authority electricity generation.
(2) Following the duty increase imposed in the 1989 March Budget 2-Star petrol rapidly disappeared from the market.

Deliveries into Consumption

UK deliveries into inland consumption of major petroleum products —Tonnes — February 1991

Products	*Feb 1990†*	*Feb 1991**	*Jan–Feb 1990†*	*Jan–Feb 1991**	*% change*
Naphtha/LDF	302,150	308,330	612,400	703,710	14.9
ATF—Kerosine	452,960	384,260	942,750	830,070	−12.0
Motor Spirit	1,856,700	1,676,770	3,773,670	3,609,700	−4.3
of which unleaded	559,400	646,910	1,124,340	1,382,990	23.0
Super unleaded	59,300	72,460	117,390	158,310	34.9
Premium unleaded	500,100	574,450	1,006,950	1,224,680	21.6
Burning Oil	216,980	249,100	430,930	590,190	37.0
Derv Fuel	846,420	781,610	1,661,540	1,706,070	2.7
Gas/Diesel Oil	753,870	810,880	1,521,840	1,736,440	14.1
Fuel Oil	926,330	1,188,100	1,995,080	2,036,790	2.1
Lubricating Oil	62,406	57,100	129,040	130,010	0.8
Other Products	754,224	403,680	1,276,830	828,630	−35.1
Total above	5,948,680	5,859,830	12,120,720	12,171,610	0.4
Refinery Consumption	447,960	456,710	971,050	998,040	2.8
Total all products	6,396,640	6,316,540	13,091,770	13,169,650	0.6

†Revised *Preliminary

Conference Report

Oil Price Information 1991

An unusual start was given to the Information for Energy Group's annual Oil Price Information Seminar, held at the Institute in February, by the Chairman, Peter Wildblood. As Chief Executive of the International Petroleum Exchange (IPE), he was able to ad-lib impressively on the role of the IPE and the futures market in helping to overcome price instability during the Gulf war. The need for this was the prevailing instability in public transport, which had delayed all three speakers. Mr Wildblood explained how keeping the market open helped to maintain liquidity and gave members the freedom to limit their losses by hedging. Much bigger losses had been sustained where markets had been panicked into closing.

Fortunately, Mr Wildblood was soon able to move on to the introduction of the meeting, explaining that good price information was essential to oil trading. The information must be timely, accurate and relevant, and the user needs to understand how it is collected to be able to assess its value to him.

Adrian Binks, the editor of *Petroleum Argus*, took up these points in discussing the problems of reporting the oil market and the sources of price information. There is some suspicion about oil company retail prices in relation to bulk prices, not only among the ordinary public, but even in government. If a price reporting service has a report of a bulk deal, it will always try to confirm the quoted price from another party. Both parties to a bulk deal may want a level of secrecy, but this is hard to achieve in practice. It also has to be recognised that traders may have an interest in trying to influence price reporting, if contract prices are based on a basket of reported prices.

At 6.30 pm (the end of the day), the price for the day is made on the evidence collected. There are a number of possibilities. The range of buyer/seller prices for crude and other products can be quoted, as *Petroleum Argus* does, and this is useful in a volatile market. Another approach is to report the high and low in deals done, with the attendant problem of whether to weight deals done at the beginning of the day. The final problem is that if the market is very slack, any price reported will be unrealistic.

Mr Binks concluded by surveying the price reporting services, many of which were demonstrated on-line before and after the meeting. Amongst regional services, an increase in importance of the Pacific Rim can be noted.

Given the current expansion of power generation from gas and its promotion as a clean fuel, it was timely to hear James Ball, of Gas Strategies, explaining why gas prices aren't just oil prices in disguise. Oil companies would like to be able to simply convert gas to its oil equivalent, but there are too many differences to make this approach valid. Unlike oil, gas is 'piped, packaged, private and political.' There is less price transparency — for example, the export price of Russian gas is not revealed. Most large deals are confidential. The price is dominated by long-term contracts, and the commodity is bundled with a service, as in the supply of domestic gas.

Gas is expensive to transport, as a given volume contains much less energy than oil. Transport therefore contributes more to the cost. No LNG carriers are at sea with unsold cargoes, and trade between strangers is rare. The 'price' is thus ultimately set in a specific market, which is probably influenced by short-term political goals.

Mr Ball believed that reporting of gas prices was Stone Age, even though prices do not move very often. Sellers can rarely charge the full value, in terms of what an alternative fuel would cost the customer. He gave some examples of how prices are set in different markets and showed how the gas price has moved in relation to the prices of some other fuels.

The final paper in a thought-provoking morning was given by John Hall of John Hall Associates. His theme was how to survive as a UK fuel buyer, based on 20 years' experience following the UK wholesale market. He gave a fuel buyer's perspective on the upstream oil price, showing that there was a price upheaval on average every seven years, although the one caused by the Gulf war was a little late.

Comparison between Brent prices, which are widely quoted, and Rotterdam prices shows that there is usually a constant relationship between them. An exception was the dry summer of 1989, when low water levels in the Rhine restricted traffic movement and pushed up the Rotterdam price.

Through comparison of the price movements of different downstream products, Mr Hall showed that in a volatile market, such as the one we experienced at the end of 1990, automotive fuel held its price much better than heating fuels. Demand for the latter is seasonal and depends on the weather, while the demand for petrol and Derv is constant and they have no alternatives.

Recent events have underscored the insecurity of the wholesale buyer. In the prior stable period, a lot of traders moved away from contract on to the spot market. Mr Hall always advised against spot buying, because the first person to come unstuck in a crisis is the spot buyer, but he recognised that it is hard to argue against a strong trend.

Despite the loss of Kuwaiti production, there was still too much oil around. The failure of the oil price to behave as expected in the past few months shows how any old rumour can cause the price to go up or down. The conclusion had to be that the future remained uncertain.

The display of price reporting services from ICIS-LOR, Saladin Computer Systems, Telerate, Reuters, Platt's, *Petroleum Argus*, Future Source UK and Energy Market Consultants was yet more colourful than in previous years. Despite the prevailing fears about international travel, there was a good attendance from many countries. ■

Judith Mirzoeff

Qatari gas: the North Field development project

The North Field gas field was discovered in 1971 but its true potential was only confirmed at the beginning of the 1980s. Stretching over an area of 6,000 sq km, this field is regarded as one of the biggest in the world, with total reserves in place estimated at 10,765 billion cubic metres. The gas is contained in four layers, one on top of the other, in the Khuff formation.

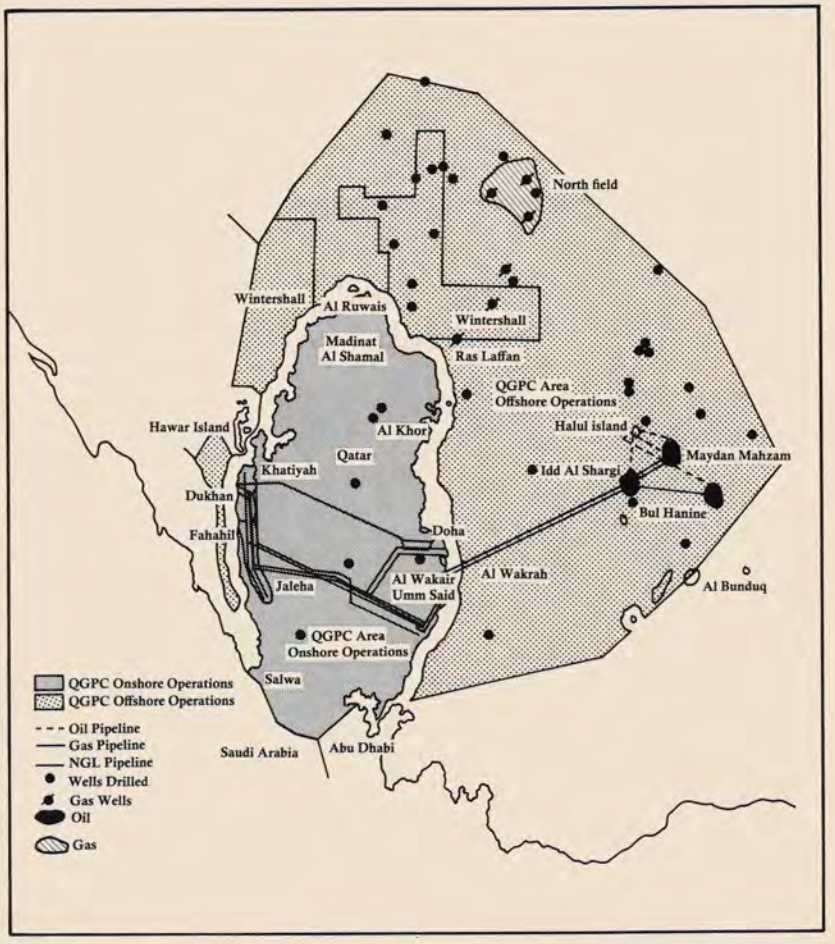
The first projects for developing the North Field were drawn up in 1984. According to the development plan set by Qatar General Petroleum Company (QGPC), the first phase is scheduled for completion this month, the second phase is to be implemented and completed in 1996–97.

It has been recently reported that the development work as well as most expansion and upgrading plans linked to the North Field project were held up during the Gulf crisis and are pending settlement of territorial disputes with Iran. In fact, what Iran calls the South Pars field extends well beyond the median line into Qatari territorial waters, while Qatar regards that whole structure as being part of its North Field. However, an official at QGPC confirmed in January 1991 that the first phase of the project was on schedule.

Phase I

In May 1987, Qatar signed a contract with Bechtel and Technip giving them total responsibility for the first phase of the North Field development programme. The contract covered the completion of engineering studies, procurement, construction supervision and assistance in the commissioning of the installations.

The facilities of the first phase consist of six platforms, including two well-head platforms and a production platform with two 11.33 million cubic metres per day (cu m/day) gas separator trains, linked to the coast by two 80-km submarine pipelines running to Ras Laffan — one 34 inches in diameter for carrying dry gas and one 12 inches in diameter for condensates. From Ras Laffan, the gas and NGLs are to be carried by two 140-km under-



Oil and Gas Operations in Qatar *Source: QGPC*

ground pipelines to Umm Said, where two NGL plants are already in operation and a third, NGL-3, is being built as part of the development scheme.

Once completed, the NGL-3 plant will process 21.24 million cu m/day of lean gas and 50,000 barrels a day (b/d) of condensates. At the outset, the project provides for the construction of a 70-km pipeline for carrying some 8.5 million cu m/day of surplus gas to the Dukhan oilfield where it will be reinjected.

It has also been decided to install a gas desulphurization unit at Umm Said to extract Hydrogen Sulphide. QGPC plans to extract some 60,000–70,000 tons/year of sulphur for export, at the same time as improving the quality of the gas.

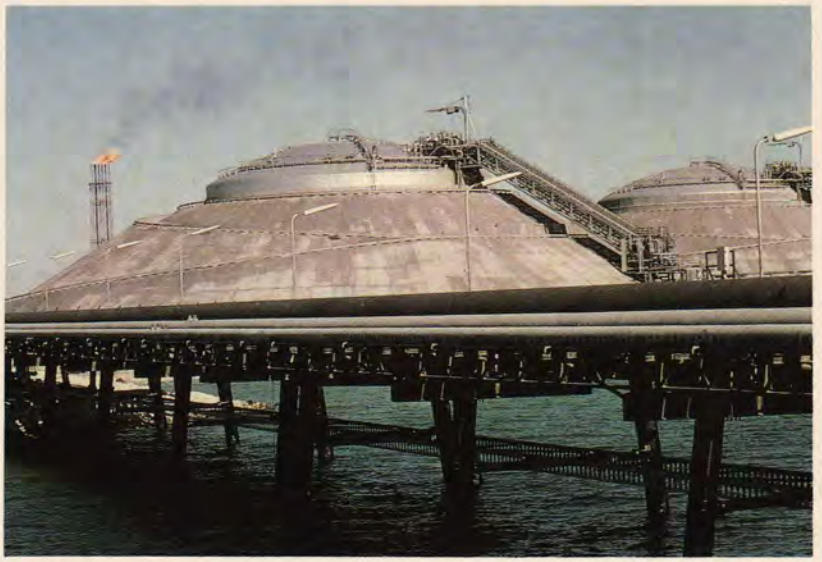
As of December 1990, the drilling of the 16 production wells at the North Field had been completed and production tests were under way on some of them. The first phase of the project is scheduled to come on stream by mid May 1991.

Cost and financing

It is already clear that the actual cost of the first phase will exceed the original estimate of $1 billion, and could amount to as much as $1.3 billion. The offshore installations are expected to account for about 40 percent of the total cost of the scheme, with the on and offshore pipeline system representing a further 40 percent, and the processing facilities at Ras Laffan and Umm Said the remaining 20 percent.

QGPC retains 100 percent control of the project and therefore its financing, rejecting the proposals of Marubeni, Amoco and Wintershall which had successively suggested taking charge of the financing of the first phase in exchange for the right to lift the condensates and LPG that will be produced.

To finance the first phase, QGPC decided to set aside the proceeds from the export of 30,000 b/d of crude oil, a volume that was subsequently raised to 40,000 b/d — worth $330 million at 1990 prices. The rest of the cost is covered by a commercial bank loan of $400 million, signed in December 1989 and subscribed by a syndicate of nine banks and financial institutions, including the Arab Petroleum Investments Corp, Gulf International Bank, Gulf Investment Corp, the Bank of Tokyo, Mitsubishi Bank, Chase Investment Bank, Qatar National Bank, Riyadh Bank and National Westminster Bank.



Gas liquefaction plant *Courtesy: OPEC*

Umm Said plant *Courtesy: OPEC*

Phase II

The second phase of the North Field development project was to be implemented by Qatargas (a joint venture between QGPC, BP, Total CFP, Mitsui and Marubeni) once the work on the first phase has been completed. However, it has been recently decided to postpone the second phase until 1996–97 when Far Eastern and European demand for gas is expected to have grown.

Phase II calls for the construction of a liquefaction plant with two 2 million-ton/year LNG trains, whose layout and design will enable capacity to be expanded in additional tranches of 2 million tons/year.

The LNG plant will be located near Umm Said and will include a loading jetty for export.

According to Qatargas, seven LNG carriers, each with a capacity of 135,000 cubic metres, will be needed to deliver 4 million tons/year of LNG to the market.

To finance the $3–4 billion second phase (and other subsequent phases), QGPC has indicated that it will continue to set aside part of its oil export receipts.

Gas production

The annual level of production of the North Field will start in 1991 at 4,652 million cubic metres of non-associated dry gas. This will increase to 6,977 million cubic metres in 1992, and 12,477 million by 1997 following the implementation of phase II. The expansion of the second phase in 2010 will add a further 2.75 billion cu m/year.

On the other hand, the associated gas output is expected to decrease slightly from the current 1,551 million cubic metres over the next 20 years. Accordingly, the annual expected production of gas is forecast to total 8,528 million cubic metres in 1995 and 13,976 million between 1997 and 2010, with further expansion still possible.

Gas consumption

The government is planning to boost the domestic utilization of natural gas, which is projected to meet more than 80 percent of Qatar's total energy needs over the next 30 years.

According to official forecasts, domestic gas consumption is expected to total 7,360 million cubic metres in 1995, and 7,391 million by the year 2000. In the first two decades of the new century, the domestic gas demand is projected to increase by an average rate of 1.6 percent annually. It will consequently amount to 8,549 million cubic metres in 2010, and 10,079 million in 2020.

The gas demand will be almost equally distributed between the power generation and water desalination sector, and the industrial sector.

Several industrial projects using gas as feedstock or fuel are currently under study. Some of the schemes being considered include the expansion of the Qatar Fertilizer Company (Qafco) complex, and the construction of a 193,000 ton/year aluminium smelter.

Also a master plan for gas industrial utilization, associated with the first phase of the North Field development project aims at optimizing the use of the existing industrial area at Umm Said to accommodate many new industries, and the construction of a new industrial city at Ras Laffan.

Gas exports

Most of the gas output generated from the first phase of the North Field development project is intended to make up the increasing shortfall in associated gas needed for domestic demand. Around 1 billion cubic metres will be available for export; however, after carrying out the second phase of the project, Qatar wil be capable of exporting 6,656 million cubic metres in 1997, 6,585 millions by the year 2000 and 6,048 millions in 2005 — and even more in later years.

Export plans

Originally, it had been envisaged that the North Field would be developed almost entirely for LNG export, but with many such schemes now competing for markets and Qatar's distance from potential buyers, the LNG plan has been relegated to the second phase.

To secure export outlet for its gas, QGPC signed in February 1991 a letter of intent with Chubu Electric Co, the third largest electric company in Japan, for the export of 4,700 million cu m/year of gas in LNG form (4 million tons/year). Under this agreement, QGPC undertook to begin deliveries by 1997 and continue for 25 years, during which exports could be stepped up to 7 billion cu m/year (6 million tons/year).

Meanwhile, a Gulf Cooperation Council project for a regional pipeline grid which would allow Qatar to sell gas to other Gulf states with gas shortfalls has been under consideration. However, with the conflict over Kuwait since August 1990, the GCC gas grid is now considered unviable.

Similarly, a long-mooted pipeline to feed Dubai's industrial zone at Jebel Ali with as much as 28 million cu m/d, is now in question, not least because regional political instability would drive industries from Dubai and consequently reduce demand.

	Production			Consumption	Export availability
	North Field's non-associated gas	Associated gas	Total	Total	Total
1991 (a)	4,652	1,551	6,203	5,250	953
1995 (a)	6,977	1,551	8,528	7,360	1,168
1997 (b)	12,477	1,551	14,028	7,372	6,656
2000 (b)	12,477	1,499	13,976	7,391	6,585
2005 (b)	12,477	1,499	13,976	7,928	6,048
2010 (c)	15,227	1,447	16,674	8,549	8,125
2015 (c)	15,227	1,447	16,674	9,283	7,391
2020 (c)	15,227	1,447	16,674	10,079	6,595

Source: Data compiled from the official publications of QGPC.

Natural Gas Balance 1991–2020 *(million cu m/year)*

(a) including the production of Phase I
(b) including the production of Phase II
(c) including the production of Phase II expanded by 2.75 billion cu m/year.

Other alternatives

Other alternatives — including natural gas pipelines to Europe and Pakistan — have also been considered. In March 1985, Qatar signed an agreement with Turkey for carrying out a joint feasibility study of a proposal for laying a 4,500 km, 30 billion cu m/year gasline from Qatar to Western Europe via Turkey. Such a pipeline could cost around $12 billion (1987 $) and would supply all countries on its route, including Turkey, Bulgaria and Austria.

In January 1991, it has been reported that a consortium headed by the Sharjah-based Crescent Petroleum has a letter of intent to construct a 1,600 km natural gas pipeline linking Qatar and Pakistan. The project will have an estimated cost of $3 billion. ■

Shareholders of Qatargas: QGPC (70 percent)
BP (7.5 percent)
Total CFP (7.5 percent)
Mitsui (7.5 percent)
Marubeni (7.5 percent)

Planned capacity: Two liquefaction trains of 2 million tons/year each, making 4 million tones/year of LNG (5.5 billion cu m/year of gas). Can be expanded by 2 million tons/year of LNG (2.75 billion cu m/year of gas).

Location selected near Umm Said for:

- Liquefaction plant
- Four storage tanks
- Loading jetty to accommodate seven 135,000-cubic metres LNG tankers

Estimated cost: $3–4 billion.

Phase II (Qatargas) plans

Woodside breaks record

Drilling engineers in the North West Shelf Gas Project believe they have created a new world record on the North Rankin A production platform by drilling a well which reaches out over 5 kilometres from the rig.

Although the well started off vertically to a depth of 300 metres, it was steered on a north-easterly direction and for most of the length it is like a shallow inclined tunnel.

The total length of the well is 6,180 metres and reaches down to a gas-filled sandstone 3,000 metres below the seabed and 5,009 metres to the north-east of the platform.

The previous record, set in Norway last year, reached 5,002 metres.

Long reach wells now make it possible for drillers to reach distant hydrocarbon accumulations from an existing platform, previously not technically possible.

Attention to safety was the highest priority and no lost time injuries were recorded during the project.

Operator Woodside Offshore Petroleum's Executive General Manager, Peter Brown, says the achievement is significant to the drilling industry as it demonstrates Australia's 'home grown' capability and places more oil and gas reserves within the reach of existing platforms.

The other participants in the LNG Phase of the North West Shelf Project are BHP Petroleum (North West Shelf) Pty Ltd, BP Developments Australia Ltd, Chevron Asiatic Limited, Japan Australia LNG (MIMI) Pty Ltd and Shell Development (Australia) Proprietary Ltd.

Micrelec new features

Micrelec have incorporated a range of new features in their latest version of the MASTER SERIES forecourt automation system.

Updated software gives the MASTER SERIES the ability to accept an increased number of credit, debit and fuel cards, process discounts and surcharges on shop and fuel sales, control the content and length of shift-end reports and provide extended report, and 'C' store information.

Available in several configurations, MASTER SERIES all include: A RECAL universal pump controller with the ability to operate up to 16 petrol pumps; a DATAPOS point-of-sale terminal that is highly sophisticated but simple to operate and DATAPRINTER report and receipt printer.

For the busier service station with high volume petroleum and shop sales, Micrelec has developed the LINKED SYSTEM. This enables two RECAL pump controllers and DATAPOS point-of-sale terminals to be connected. Transactions are fully interchangeable to allow customers to be served at either paypoint.

New hydrogenation process

ABB Lummus Crest and Criterion Catalyst Company L.P. have announced the introduction of the new SynSat™ Process, which provides an economically attractive route to aromatics reduction and deep desulphurization for diesel fuels.

Based upon extensive research, Criterion has developed proprietary catalysts which are optimized for diesel aromatics saturation at low pressures. These catalysts have been combined with Lummus Crest's Arosat® Process, a commercially demonstrated process licensed by Lummus.

The SynSat process, short for Synergetic Saturation, is being offered to the petroleum refining industry as the most economical route for meeting both existing and proposed regulations for maximum aromatics content in diesel fuel.

The lower pressure approach of the SynSat Process results in significantly lower capital investment.

For many refiners, this lower pressure will allow a relatively inexpensive unit revamp where capital investment may be only 30–40 percent of that required for conventional high pressure technology.

Simon re-equips Kuwait firefighters

Simon Access, a member of the Simon Group, has already completed delivery of an order to re-equip Kuwait with nearly £4 million worth of fire-fighting equipment since the end of the Gulf war.

The order from the Kuwait Emergency Recovery Programme was turned around extremely quickly in view of the situation in Kuwait. The contract involved the organisation of special production schedules at Simon-Dudley and Simon Gloster Saro in the United Kingdom and Simon-LTI in the United States.

The order comprised two Super Snorkel SS600 machines from Simon-Dudley, two high-performance fire-fighting trucks from Simon Gloster Saro and three 100ft ladder towers from Simon-LTI Inc in the USA.

The units supplied are of the latest 'state-of-the-art' design and are acknowledged by fire brigades the world over to be the most advanced of their type available.

Forecourt payment

The new forecourt payment terminal from Edacom Data Systems

An advanced Forecourt Payment Terminal (FPT) from Edacom Data Systems is set to give petrol filling stations operators the opportunity of offering even higher levels of customer service.

The EDACOM FPT enables fuel-only customers to pay for their purchases without having to go into the forecourt shop.

By using an Edacom FPT, 16 hour sites can easily be converted into 24 hour sites, with no additional staff overheads. The FPT can also be linked to more than one pump. Ergonomic in design and of modular construction, the EDACOM FPT is fully weatherproof and also suitable for wall mounting. The terminal includes a key pad with 16 keys, a magnetic card reader, a 4 line 40 character liquid crystal display and a 20 characters per line printer.

Refinery toxic waste solution

A process that reduces toxic petroleum wastes by 85 percent or more while recovering valuable oil has been developed and patented by researchers at Battelle's Pacific Northwest Laboratories.

American oil refineries annually produce more than 720,000 metric tonnes of emulsified petroleum sludge, which contains heavy metals such as chromium and lead. Recent government regulations are making disposal of this material difficult and expensive.

The Petroleum Sludge Treatment (PST) process involves heating the sludge under high-pressure conditions. Under pressure, the emulsion breaks apart at relatively low temperatures and separates the sludge into three distinct layers of oil, water and solids.

The separation occurs rapidly within a single vessel. The oil and water then can be recycled to the refinery, leaving only the solids for disposal. The solids remain toxic because of the chromium and lead content but the amount that must be treated and contained can be reduced by 85 percent to 95 percent, according to laboratory test results.

Oil refineries historically have disposed of the oil and water emulsions by land farming or spreading the sludge in trenches, a practice banned in November 1990 by the US Environmental Protection Agency. It approves incineration as a means of disposing of the waste but this has not received wide acceptance.

With Battelle's system, it is estimated that disposal costs can be cut to just one-fifth to one-tenth the cost of traditional methods. Additionally, the process is expected to pay for itself since 10 percent to 40 percent of the sludge is oil which can be recovered and returned to the refinery.

The separation process was discovered when researchers added heat and pressure to petroleum sludge in hopes of producing methane gas. This method did not produce gas but scientists noticed the sludge had separated into three layers. Battelle has completed bench-scale tests on petroleum industry sludge samples in an autoclave. The results were the basis for a US patent issued last November. Scientists now hope to build a demonstration plant.

Smokeshield for evacuations

A fire on a rig could mean an evacuation in a hurry. But even with adequate fire exits this can still take time — time which might be vital in getting people to safety. The lightweight and compact Smokeshield smoke hood can help give people that time. The hood, made by Dowty, provides head and eye protection using high-temperature resistant polyimide film. Smoke particles are removed from the inhaled air by a multi-element filter.

The cat's whiskers

Stena Offshore Limited has been awarded a contract potentially worth £7 million by McDermott/ETPM Inc for pipelay support on the Amoco Cats Pipeline. The 36 inch pipeline stretches 410 km (255 miles) from the Amoco Cat's platform to Tees-side.

Onshore work started in February 1991. The project will involve crossings, pipeline abandonment/recovery assistance, pipeline tie-in and testing. Offshore work begins in June 1991 with one crossing and is expected to last 30 days. Work on the hyperbaric welded tie-in at the Cats riser platform (with an optional intervention valve), is expected to be completed in the third quarter of 1992.

The Amoco Cats project brings the total number of hyperbaric welds performed by Stena Offshore to 17 and now makes them the world's leading subsea intervention valve installer with a total of nine installations to date.

Active detonation arrester prevents damage to plant

The collection of waste and toxic gases for disposal has presented industry with the problem of high speed explosion risks, frequently resulting in detonation with the potential of severe damage to plant and personnel.

Now, two high technology explosion protection companies; Colnbrook-based Kidde-Graviner, and sister company Fenwal Safety Systems of Boston, USA, have jointly researched and released details of an active detonation protection system designed to operate in less than 25 milliseconds.

Because of environmental pressures there has been widespread installation of waste gas and solvent recovery processes for the chemical and petroleum industries. These recovery processes collect and dispose of harmful gases but in doing so, present a significant explosion risk.

Such gas recovery systems usually consist of a pipe network connecting the process to the collection device. The pipes can often be many hundreds of metres in length, with multiple points of extraction linking into a common pipe terminating at an incinerator.

Recent tests on their new protection system were done against the most violent explosion that could be generated in a 450 mm pipe over 150 metres length. The tests were completely successful, detecting and preventing explosion propagation.

Using high speed explosion suppression combined with rapid action valves, the system effectively isolates pipes both chemically and mechanically, providing users with a proven and reliable system that protects both personnel and plant, without impeding normal operation of the vapour recovery processes.

The Institute of Petroleum

Preliminary Notice

THE FOURTH OIL LOSS CONTROL CONFERENCE

REAL AND APPARENT LOSSES IN REFINING AND STORAGE

A two-day conference to be held at the Institute of Petroleum, London, on

30 & 31 October 1991

The subjects to be covered include: Loss Accounting, Crude Oil Measurement, Water in Crude Oil, Oil and Gas Metering, Estimation of Refinery Fuel Consumption, Tank Calibration, Refinery Loss Statistics, Tankage Evaporative Losses, Fugitive Losses from Plant and Machinery.

Please note the dates in your diary. Further details will be provided shortly. Contact: Caroline Little, The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR. Tel: 071-636 1004. Fax: 071-255 1472. Telex: 264380.

TECHNICAL ASSISTANT

An Assistant is required in the Technical Department of the Institute of Petroleum. He/she will assist Technical Officer — Standardisation and Technical Officer — Measurement, as required, particularly in new British Standards work which is being undertaken by the Institute.

The work will involve semi-technical activities. However, he/she will be working under the supervision of experienced Technical Officers who will explain and assist on any technical points that arise.

Candidates should have a flexible attitude and be self-starters capable of working without direct supervision. Expected educational qualifications to at least A level or equivalent.

Some previous use of a word processing system will be desirable, since PC systems will be used when these can improve the efficiency of operations.

The Institute is situated in Central London, close to Oxford Street underground station. A contributory pension scheme is in operation and benefits package is available.

Starting salary about £14,000 with annual increments depending on performance.

Apply to J Hayes, Technical Director, at The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR.

Comments were submitted to the Commission of the European Communities on the Commission's Green Paper on Standardization: Action for Faster Technological Integration in Europe. The IP's thrust was that the oil industry is international in its activities and that attention should be focused on the adoption of ISO standards where they exist. We also proposed that specialised industry committees should be set up to formulate policy and strategy for standardization in individual major industries in conjunction with their customers.

The Institute's Consultant List is now operating successfully with over 200 members offering services in over 40 categories of expertise. To date about 100 lists have been supplied to enquirers.

Exploration and Production

The third edition of the Drilling and Production Safety Code for Offshore Operations was published in March.

Work continues on the development of a Code of Practice concerned with the control and testing of high pressure high bottom hole temperature (HPHBT) wells. The scope of the work is now concerned only with offshore HPHBT wells. A fourth draft stage has been reached.

Work continues on the final stages of the Oil Muds Code of Practice. A draft of this code has been passed to the E & P Forum with the objective of obtaining their recommendation of the code.

Refining and Marketing

Discussions have been held with the Association for Petroleum and Explosives Administration (APEA) and the London Fire and Civil Defence Association (LFCDA) on the latter's proposal that double skin underground steel tanks be installed at new service station developments. This proposal is linked with a requirement that the annular space between the tank walls is positively monitored for leakage. Further meetings are to be held with the local authorities to discuss the lifespan of underground steel tanks and testing procedures.

Following a technical presentation on electrostatic risks on road tanker loading by Dr H L Walmsley of Shell's Thornton Research Centre to a large audience at the Institute and considerable discussion of the Chairman's position paper on the subject in Marketing Sub-Committee, all the companies represented indicated that they were either already putting anti-static additive into middle distillate or are making preparations to do so.

With the continuing increase in the amount of exchange deals and pick-up arrangements, the need has been recognised for a compatibility standard for road tanker on-board computers which is being prepared by an ad hoc working group.

Significant technical input has been provided to government and CONCAWE concerning EC proposals for Stages 1 and 2 vapour recovery.

Work is now starting on incorporating comments received from various UKPIA and IP Committees into the Users' Guide to Potential Safety Hazards of Hydrogen Sulphide in Heavy Fuel Oil.

Measurement

Petroleum Measurement Paper No 4, Code of Practice for the Proving of Loading Gantry Meters, was published in January.

Technical comments were submitted on two draft standards which will be published shortly as the first API/IP joint standards in the field of petroleum measurement — Manual of Petroleum Measurement Standards, Chapters 2.7 and 2.8, Calibration of Barge Tanks, and Calibration of Tanks on Ships and Ocean Going Barges.

The proceedings of the Workshop on 'Problems Encountered During Independent Inspection of Crude and Petroleum Product Shipments' have been prepared and are awaiting approval by the presenters before being issued to delegates.

Arrangements are being made for the Fourth IP Oil Loss Conference which will be held at the IP on 30/31 October 1991. The title of the conference is 'Real and Apparent Losses in Refining and Storage'.

Standardisation (Test Methods)

1991 Standard Methods for Analysis and Testing of Petroleum products was published in March. This edition has been printed in A4 size and includes four ISO methods, which replace the previous IP methods. In addition °F has been deleted from all but the density methods, new Density of Water tables based on the ITS 90 temperatures have been provided and a new Foreword includes New Method Format and Presentation sections.

The proposed move of the Secretariat of the PTC/13 Analysis committee with its technical responsibility for BS Petroleum Test Methods, from BSI to the IP has reached the stage of a Draft Deed of Agreement, this is currently being considered. A Technical Assistant is to be recruited for this work.

Health & Environment

An Autumn conference on 'Automotive Fuels — Environmental and Health Implications' is being organised by the Environment Committee and the IP Advisory Committee on Health.

A preliminary report of the IP Epidemiological study of refinery workers has been produced for the ACH Steering Group. The study appears to confirm the 1980 study conclusions that there is no incremental health risk associated with working in refineries.

The American Conference of Government Industrial Hygienists have been advised that the ACH does not support the proposal to reduce TLV exposure level for benzene to 0.1 ppm. The ACH will produce a critique of the ACGIH documentation which was developed to support the proposal.

J Hayes, Technical Director

. . . people

Offshore Certification Bureau have appointed **Dr Andrew Smith,** below, as Scottish Area Manager. Mr Smith has 18 years experience which includes appointments such as HM Chemical (Fire and Explosion) Inspector (HSE) and Health, Safety and Environmental Adviser to Occidental.

Mr Hugo Johnson has been appointed Director of Operations for the London Office of the Society of Petroleum Engineers (SPE). Mr Johnson will be responsible for coordination of SPE programmes and activities in Europe, Africa, the Middle East, and India.

British Columbia Petroleum Corporation has made two new appointments to the corporation's board. **Mr Henry Thiel,** a former oil industry executive who has acted as an independent consultant and **Mr John Allan,** Deputy Minister of British Columbia's energy ministry.

Offshore contractor, Rockwater, has appointed **Mr Iain Grainger,** below, as Commercial Manager Projects Group. Formed in October last year, the Projects Group is one of five business units and concentrates on targeting major field developments around the world.

Carless Refining and Marketing Limited have made four new managerial appointments: **Mr Hugh Leonard** has been appointed Marketing Manager for the company's new toll processing operations. **Mr Steve Bannington,** has become the UK Sales Manager for the company's Solvents and Chemical Division. **Beverley King** has been appointed to the position of Feedstocks Manager with responsibility for sourcing feedstocks for processing at the company's Kilpatrick and Harwich refineries. **Mr Leslie Smith** has been made Product Manager responsible for the company's range of printing ink distillates.

From left to right: back row—Leslie Smith, Steve Bannington,; front row—Hugh Leonard, Beverley King.

The Vice-Chancellor of Exeter University, **Dr David Harrison,** CBE has been elected President of the Institution of Chemical Engineers. Also elected at the meeting were four Vice-Presidents, **Mr William Chatman,** Chairman and Chief Executive, Foster Wheeler Ltd, **Professor Peter Heggs,** Head of Chemical Engineering Department, University of Bradford, **Mr Gordon Campbell,** Executive Director, Courtaulds Ltd and **Mr John Collier,** Chairman, Nuclear Electric plc.

Total Oil Marine plc has appointed **Mr Douglas Edwards** as a Director of the company. Mr Edwards has been with Total for 17 years, most recently as Commercial Manager in London. Prior to that he worked in the Finance Division, the Gas Division, and the Exploration and Production Division of the Group.

Mr Norman Chambers, Chief Executive Officer of Rockwater, has been elected Chairman of AODC — The International Association of Underwater Engineering Contractors — with **Mr Bernard Vossier,** Managing Director of Comex UK, as Vice Chairman. **Mr Malcolm Williams** has been elected Honorary President of the Association.

Scully UK Ltd have appointed **Kevin Dawson** as their new Sales and Services Manager for the United Kingdom and Eire. Prior to this appointment, Mr Dawson, as a director of a Scandinavian UK-based company, was responsible for sales of electrical components into a wide variety of original equipment manufacturers accounts.

Mr Ralph Ragsdale has been appointed to the newly created position of Technology Manager — Refining, for Bechtel Corporation. Mr Ragsdale, who has 30 years experience, will be responsible for securing access to refining technologies, providing specialised expertise and monitoring the application of technologies for the corporation's refining projects.

Mr Derek Randall has been appointed executive director to the board of John Wood Group plc. He will also become managing director of the group's joint venture engineering design company, Foster Wheeler Wood Group Engineering Ltd, where he has been general manager for the last three years, under secondment from Foster Wheeler Ltd.

Mr Nigel Preston, below, has been appointed Senior Asphalt Engineer for Shell Bitumen UK. He succeeds **Mr David Whiteoak** who has joined Shell International Chemicals to work on polymer modified bitumens.

Humphreys and Glasgow International plc have announced the appointment of **Mr Dan Murphy** as Managing Director of one of its two new operating companies, H&G Offshore Engineering Ltd. Prior to joining H&G, Mr Murphy held a senior management position within Occidental Petroleum with North Sea development project responsibilities.

Mr George Goodsir has been appointed Chief Counsel of OMV's London operation. Mr Goodsir was formerly Director of Occidental Petroleum (Caledonia) Ltd in Aberdeen.

Mr Frank Crawley, below, previously with BP Exploration/ Britoil, has become a consultant in safety engineering and loss prevention for WS Atkins Engineering Sciences Limited.

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