SEPTEMBER 1991

The Institute of Petroleum

PETROLEUM REVIEW

United Kingdom

'Green' issues dominate onshore exploration

Eastern Europe

Patterns of petroleum storage and distribution by Edward J Osterwald

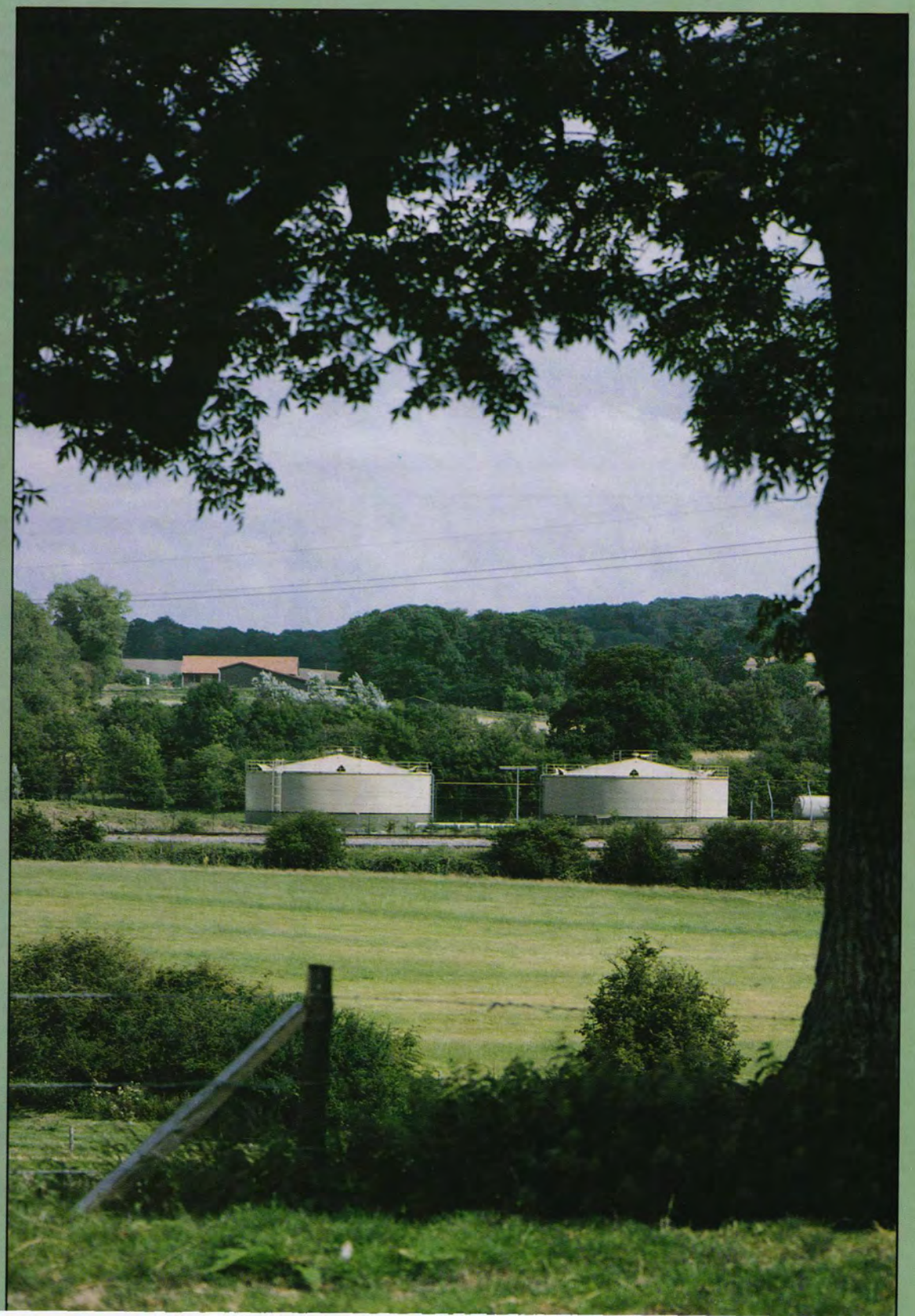
Trends in the market for automotive and industrial lubricants by James Mills and Manuel Poupon

Namibia

Large areas have been opened up for exploration

Europe

Growth of unleaded petrol market by Dr Ian Berwick



Energy Economics Group

The following meetings of the IP Energy Economics Group have been arranged:

Thursday 5 September

'The Impact of a Labour Government on Industry'
Speaker: **Manda Holdsworth,** Phoenix Plus

Thursday 12 September

'Global and Regional Energy Supplies: Some fictions and fallacies revisited'
Speaker: **Professor Peter Odell**

The meetings will begin at 5.30pm at the IP. Tea and biscuits will be available from 5.00pm. For further details contact: **Mrs Jane Thompson** on **071 636 1004.**

1992 IP Annual Dinner

The Institute of Petroleum's Annual Dinner in 1992 will be held at Grosvenor House, Park Lane, London W1, on **Wednesday, 19 February.**

IMPORTANT — PLEASE NOTE

Ticket application forms will be sent to all UK/European individual and collective (company) members as a loose-leaf insertion in their OCTOBER copy of Petroleum Review. Non-UK/European Members who wish to apply for tickets should contact **Caroline Little** at the IP at 61 New Cavendish Street, London W1M 8AR, as soon as possible. Tel: **071-636 1004.** Telex: **264380.** Fax: **071-255 1472.**

The closing date for receipt of ticket applications will be FRIDAY 25 OCTOBER 1991.

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Cover photo of Kelt Energy's Holybourne terminal. Photo courtesy of Kelt Energy.

. . . news in brief

12 July

Amerada Hess Corporation is to expand its refinery in St Croix, US Virgin Islands, already one of the largest in the world.

The UK Department of Energy has given the go-ahead for development of the Chanter field, operated by EE Caledonia—the North Sea's newest company formed when Elf and Enterprise Oil acquired the UK assets of Occidental Petroleum Caledonia.

16 July

Gulf Oil has purchased for around £17m 32 service stations in south Wales from the Action Service Stations Group. Gulf will now have 485 outlets in Britain.

BP has spent an extra £15m on additional safety measures for the Miller field topsides as a direct result of the Piper Alpha disaster.

17 July

Fletcher Challenge has bought a 71.5 percent stake in Southern Petroleum, a New Zealand oil exploration company for US$29.6m.

18 July

Occidental Petroleum has become the first US oil company to be awarded a production-sharing contract in Albania.

US oil company Conoco has revealed that last year's exploration programme increased the company's possible reserves by 400m barrels.

Work has started on a new multi-million pound bulk liquid fuel terminal at Gladstone Dock, Liverpool, to handle Orimulsion from Venezuela.

19 July

A revised code to improve off-shore standby vessel standards has been implemented by the Department of Transport and the Health and Safety Executive.

20 July

French oil company Elf Aquitaine has agreed to sell all its upstream production and distribution in Spain to the state controlled oil company Repsol.

22 July

Oryx Energy has announced that its North Sea natural gas production will increase substantially as a result of a redetermination of interests in the Audrey gasfield.

Oil finds at West Linpacan, Palawan, in the southern Philippines could be as prolific as the UK North Sea oil fields, claimed Charles Alcorn of the Alcorn Group speaking in Manila.

23 July

British Gas has strengthened its foothold in the eastern German market by acquiring a 25.5 percent stake in a new gas distribution company to serve the area of Leipzig in Saxony.

24 July

The Conservative Bow Group has unveiled a new environmentally led energy strategy which includes a call for further taxation incentives to encourage UK oil and gas field developments.

A group of Polish businessmen has acquired 50 percent of the biggest Israeli petrol distribution company, Pax, for $85m.

25 July

A contract worth £20m has been won by Aberdeen-based specialist Rockwater for work on the Amerada Hess Scott field.

Poland and the Soviet Union have concluded the preliminary stages of a barter deal under which Poland will pay for more than a fifth of its imported Soviet crude oil this year with medicines.

Norway has taken the first formal step towards staging a new offshore licensing round next year by inviting oil companies to indicate blocks they would like to see included in a hand-out.

26 July

French oil company Total has awarded a major five year £30m standby vessel contract to North Star Shipping. The contract is Total's North Alwyn field in the northern North Sea.

The European Commission has dropped an inquiry into a joint oil venture between Societe Nationale Elf Aquitaine and Enterprise Oil in the British sector of the North Sea.

27 July

Marathon Oil UK Ltd has received a $300m European Investment Bank loan to partly finance its North Sea developments.

The environmental group Green-peace is trying to prevent offshore oil and gas exploration drilling in environmentally sensitive waters off the north Dutch coast.

29 July

Kuwait shipped two million barrels of crude oil to western Europe, becoming an exporter for the first time since the invasion by Iraq.

30 July

Oman will begin drilling its first offshore oil well in October.

31 July

Denison Mines reports that it has entered into an agreement to sell all its oil and gas properties in Egypt for $13m in cash.

1 August

UK oil production fell to 1.7m bpd in the first half of 1991, the lowest level for eight years.

The European Community has cleared BP's acquisition of Petromed, Spain's smallest oil refiner.

Japan's Mitsui Oil Co Ltd has signed a contract to buy an annual 180,000 tons of liquefied petroleum gas from Australia's Santos Ltd.

3 August

Onshore natural gas reserves have been confirmed in Echague, Isabela, on the main northern Philippines island of Luzon.

Thailand is laying 33.6km of underground pipe to link two oil depots in Bangkok with Don Muang International Airport.

5 August

US oil company Atlantic Rich-field has announced a major reorganisation which includes a 17.5 percent cut in its 20,000 US workforce.

6 August

Total, the French state-owned oil company, has proved an extension of Markham, the gas field straddling the British and Dutch sectors of the North Sea.

Amerada Hess, the US oil com-pany, has set up a gas marketing arm in the United Kingdom to compete with British Gas in selling gas to industrial and commercial customers.

7 August

Trafalgar House has undertaken to divest itself of parts of the Davy Corporation which threatened its £114m takeover of the engineering group.

9 August

Eastern Germany's first new power plant since reunification is to be constructed at Rostock. The coal-fired station is due to come on-stream in 1994.

Whessoe has acquired Connex Pipe Systems, a US-based fabricator of high integrity piping systems for about £5.5m.

12 August

The South African units of Royal Dutch/Shell Group and British Petroleum have announced a £92.3m expansion for their jointly-owned refinery in Durban.

Onshore explorers face-up to green field issues

By Mark Scruton

Oil production onshore in the United Kingdom, despite its small size, plays a significant role within the British oil industry.

Even though the onshore accounted for only two percent (36,550 barrels a day (b/d)) of the production offshore (1.8 million (b/d)) last year, it is an important market because it gives the opportunity for smaller independents to play a major part in exploration.

It is these independents that appear to be most confident as the Department of Energy considers the applications for licences in the fourth onshore round announced last May.

But in some ways the signs are that the heightened public awareness about environmental issues will make it increasingly difficult for companies to develop projects — especially in areas which have not previously seen drilling exploration.

Although the independents play a major role, onshore production is dominated by British Petroleum. More than three-quarters of the onshore total last year was from the largest field with BP Exploration's operated Wytch Farm (28,353b/d) and the company operated Welton field (3,301b/d) second. The third largest operator was small independent Kelt Energy with its Humbly Grove field (890b/d).

Since then production at Wytch Farm has increased to over 60,000b/d giving BP Exploration, with its 50 percent stake, the lion's share of the onshore market. (Now at nearly 72,000b/d.)

Economic factors

Onshore exploration is attractive to the smaller independents because although potential daily output is small in comparison to North Sea standards, costs are dramatically lower and distribution, once oil has been found, is easier.

Equally, one of the reasons why larger companies are pulling out of the market is because of the present tax regime. Unlike offshore, they cannot offset the cost of exploration onshore against Petroleum Revenue Tax (PRT). This essentially makes it more expensive for PRT payers to explore onshore while making the economics more attractive for smaller companies who do not pay PRT.

The Department of Energy admits that over the past few years there has been a trend for some of the larger companies to dispose of their onshore licences.

There are numerous examples of this. Since 1988 BP has sold fields to Pentex, Cairn Energy has taken over all Conoco's holdings and Carless Petroleum has sold out to Kelt.

This trend continued during 1990 despite some small independent companies, notably Pentex and Cairn Energy, bringing new fields on stream.

Official figures show that at the end of 1990 there were 215 onshore petroleum licences covering an area of 35,522 square kilometres, a lot less than 1989 when there were 268 licences over an area of 46,014 square kilometres.

Fourth round

Now the government has announced plans for a new fourth round for licences onshore, a move which some companies claim will give encouragement to the onshore industry.

According to Bill Gammell, chief executive of Cairn Energy, a small independent which is very active onshore, the fourth round of licence awards should provide encouragement for the UK onshore industry.

He said: 'The fact that there is now the ability to convert existing licences to work programmes as well as apply for new acreage is a positive step forward for the industry.'

Mr Gammell believes that onshore activity is the province of the niche player where smaller companies with existing production, such as Cairn, can maximise the profitability of the reserves find. He said, 'Cairn is a specialist independent company with an existing production base that finds onshore activity attractive, particularly since Cairn has operating capability.'

Successful fields

There have been some notable successes during the past year or so in the East Midlands and the south. In 1990 three onshore fields — Long Clawson, Wareham and Whisby — were given production approval and so far this year, things have been just as good.

Kelt UK Ltd was given the go-ahead to start phase production of its Singleton field this May. The oilfield is Kelt's third onshore field to obtain production consent and is situated north of the West Sussex village of Singleton, near Goodwood, and some 11 miles east of Kelt's existing Horndean oilfield.

The first phase of production is planned to average 300b/d. Subject to Department of Energy consent for further phases of development, production could rise to around 1,000b/d and result in the recovery of 2.25 million barrels over a 10 year period.

Produced oil will be held in storage tanks on site prior to shipment by road tanker to Holybourne rail terminal near Alton, Hampshire, which also takes the production from Horndean and Humbly Grove.

Incidentally Kelt used to have a 7.5 percent stake in BP's Wytch Farm (worth about 4,500b/d) which it acquired when it took over Carless Petroleum in 1988. But, in order to reschedule its debt, Kelt has sold the stake to a consortium led by banker American Express.

Another small independent, Pentex, has been given the go-ahead to develop

Kelt's Holybourne crude oil loading terminal.

its Rempstone field. First discovered in 1985, the field is located 10 miles southwest of Nottingham.

The economic development of this field is made possible by Pentex's Gainsborough gathering centre in the East Midlands, acquired from BP Exploration in 1989 when it bought 12 percent of BP's existing onshore licence acreage and seven percent of its British onshore oil production (an average production of 1,100b/d from eight small fields).

The first phase of the production at Rempstone is planned to add an initial rate of 80b/d to this figure, building up to a plateau of 350b/d next year. The produced oil will be transported by road for processing to Gainsborough along with production from Pentex's newly producing fields of Long Clawson, near Leicester, and Kirklington, Nottinghamshire. (Approved in October 1990 and March 1991 respectively.)

Long Clawson, discovered in March 1986, cost £2.6 million to develop and has an initial rate of 350b/d. Total recoverable reserves are thought to comprise 2.73 million barrels of oil with a field life of 10–16 years.

Ultramar have also had a success with its first UKCS 100 percent operated field at Stockbridge in Hampshire. The Stockbridge oilfield was discovered in 1984 and production started in January 1990 at a rate of 850b/d.

Ultramar made the decision for a phased development programme on the field. Phase I has included bringing six existing wells into production, assessing their performance and improving productivity by propfracing and additional perforations. Production is now up to 1,600b/d, with the potential of being able to produce up to 2,000b/d. Presently, oil is transported by road tanker to Holybourne oil terminal operated by Kelt.

Ultramar is about to embark on Phase II. This will be a detailed reservoir study of the field to assess the application of infill horizontal wells. If viable this will initiate an additional drilling campaign.

British Gas struck oil at Beckering, approximately 10 miles northeast of Lincoln. The well was drilled to a total depth of more than 5,000 feet and two drill stem tests were carried out over a depth range of oil bearing sandstone. Oil flowed at 120b/d with minor amounts of gas. Further appraisal of the well will be undertaken subject to government approval.

British Gas also had a 25 percent stake in the Whisby field near Lincoln which came on stream last year. The well, operated by East Midland Oil and Gas Company, produces 76b/d and oil is transported by road to Immingham.

Wytch Farm

The continuing onshore success story is the soaring increase in crude production at BP's Wytch farm, all part of a £450 million project which includes drilling 41 new wells — 30 oil producers and 11 water injection —

Ultramar's Stockbridge field.

Cairn Energy's Palmers Wood field.

and the construction of a new gathering station at Wytch Heath, close to Poole Harbour. (See *Petroleum Review*, September 1990).

At the same time a 16-inch 56-mile pipeline was laid from Purbeck to new export facilities at Hamble where part of the former products-handling terminal has been converted for crude oil exports.

Twenty-one of the new wells will be drilled from two sites on Furzey Island, a small island in Poole Harbour. There are also proposals to drill the additional wells from an artificial island about a mile off the coastline following the appraisal of the eastern projection of the Sherwood reservoir.

This extension accounts for one-third of the estimated total reserves of 300 million barrels of oil equivalent (crude, condensate and NGLs), which makes Wytch Farm BP's sixth largest oilfield in the United Kingdom.

Output has risen in phases from an initial level of 10,000b/d to a 'plateau' level in excess of 60,000b/d. This increase of production at Wytch Farm, with its resultant need for more infrastructure — a larger gathering station and more pipelines — led to a lot of debate with the local community. The much publicised outcome of the debate is a classic example of how an oil company can successfully demonstrate its ability to carry out major development in an environmentally sensitive area.

Another good example is Cairn Energy's Palmers Wood field, just off the M25 in Surrey, which came on stream a year ago. An initial rate of 1,200b/d from four wells has been boosted to around 1,400b/d. Oil is stored on site and then transported by road tanker to Kelt's Holybourne terminal.

Cairn is justifiably proud of Palmers Wood, which is another example of how local residents and oil companies can work out environmental solutions which are acceptable to both parties. It is interesting to note that although Palmers Wood gained approval for development, 12 other applications made in southern England during the same time were refused.

Environmental issues

Field gathering stations are generally the single most sensitive issue about a planned onshore oil or gas field which can arouse strong feelings amongst local residents.

Once a drilling site has been built, the well drilled and production begun, there is very little to object to — 'nodding donkeys' are now generally being replaced by the less obtrusive downhole pumps.

But the main problem is that not only are field processing and storage location large and permanent but they create problems especially if they are associated with road tankers on rural roads.

The growing public awareness today has meant that oil companies have to go to great lengths — unequalled by almost any other industry — to make sure local residents are happy. This has meant that companies have to bury their pipelines and often completely hide their field gathering stations.

In many cases having to deal with the environmental factors can mean getting approval is a lengthy process — a major drawback which considerably increases the overheads for the company. In addition most companies now have to embark on a campaign to put over their views about the site well in advance of any work taking place. Even before the site can be drilled, they have to begin a dialogue with the local community — especially if the residents seem to suffer from the NIMBY 'not in my back yard' syndrome which seems to be prevalent in certain parts of the country.

For instance, it seems to be 'easier' to get approval for exploration in some areas of the country than others. In areas used to onshore drilling, like the East Midlands, there appears to be less objections to exploration from local residents. This is due, partly to favourable contacts built up over the years with local residents and local government agencies, and partly to the good environmental record of the onshore industry in these areas.

However, in new areas, especially near local beauty spots or historical sites, oil companies have been less fortunate. Plans by Arco British Ltd to drill a 6,000ft wildcat near Hadrian's Wall were held up when they ran into opposition from local people including archaeologists and environmental groups.

The company, granted an exploration licence by the Department of Energy, wanted to drill on a three acre site at Stagshaw, near Corbridge, only 100 metres from the ditch and bank which forms the Roman wall's southern fortifications.

The local authority, Northumberland County Council, had already given approval for a temporary 135ft rig close to the 2,000-year-old World Heritage Vindolanda site, despite over 100 letters of protest from local pressure groups.

It was these letters of protest and a widespread and generally unfavourable media coverage which turned the site into a *cause celebre*. At the time of going to press Michael Heseltine, the Environment Secretary, has blocked the scheme, telling the planners to withhold consent for the £1.25 million test drilling, until he has considered the matter.

Another company is also facing environmental pressures hostile to its development plans. Despite their good record at Palmers Wood, Cairn Energy has encountered opposition to their plans to drill near a local beauty spot, Box Hill, in Surrey, where the company had identified a potential oil-bearing site.

The company, which has already shown that it could successfully operate the nearby Palmers Wood field without disturbing local residents, promised to keep environmental disturbances to a minimum.

It already has agreement in principle to use land owned by the East Surrey Water Company on the edge of its Box Hill reservoir and underground concrete storage area. But Mole Valley District Council, in whose area the proposed well site lies, is unlikely to support the application.

This has disappointed Cairn Energy because they believe their environmental record is second to none. In a recent interview Robin McKie of Cairn Energy said: 'The drilling rig will only be there for four weeks. The rest of the time we will be as unobtrusive as possible.'

He added: 'It is in our interests to have a good relationship with the locals and have acceptable standards.' He believes Cairn can meet these standards adding that most people would be hard put to find the existing oilfield at Palmers Wood. ■

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Synergy at work


even recommend the competition.

Repsol buys new sites

Repsol's purchase of 29 service stations shows that the company is still actively pursuing a £35 million rapid expansion plan for its downstream activities in the United Kingdom. Part of the plan is to put the company's name on the map — at least 16 of the service stations bought from Norfolk House Service Stations will operate under the Repsol brand name.

Coupled with other acquisitions the company are looking at 20 to 25 named Repsol sites within the United Kingdom by the end of this year. The company already have a 530 site network in operation under the 'Anglo' brand name, giving Repsol three percent of the UK market.

Lou Stroud, Managing Director of Repsol Petroleum, said: 'Our immediate aim is for a rapid implementation of the Repsol brand onto a number of quality filling stations by the end of the year.'

Pictured here is the first Repsol brand service station in the United Kingdom at Kingsley Moor. The project was the result of close collaboration between Repsol Petroleum, designers Wolff Olins and Pedro Moraleda, Corporate Marketing Manager for parent company Repsol SA.

Nelson contracts

The Government has granted approval of the development of the £1.1 billion Nelson field. Contracts and orders worth £300 million have already been placed.

Work on Nelson will provide up to 5,000 jobs in design, fabrication, hook-up and commissioning over the next three years. The field is due to come into production early in 1994.

The field is 180 kilometres east of Aberdeen in 84 metres of water. It has estimated recoverable reserves of 450 million barrels of oil. The estimated recoverable reserves of gas are 5.2 billion cubic metres. Sales gas will be 2.4 billion cubic metres. Some 3.6 million tonnes of natural gas liquids will also be produced from the oil and gas.

Seven companies are participating in the development, with the major shares held by Enterprise Oil and Shell/Esso and the smaller interests by BP/Mobil and Total/Elf.

The design and construction of the facilities are the responsibility of Shell UK Exploration and Production. Enterprise will undertake all the development drilling and will operate the field when it begins production.

Up to 80 jobs will be created by Enterprise at its Aberdeen operations base and staffing of Nelson's offshore operations will create about another 250 new ones.

Nelson will be developed primarily through a platform capable of producing at peak 160,000 barrels of oil and two million cubic metres of gas a day. Parts of the field beyond reach by drilling from the platform will be developed by satellite subsea wells, tied back to the platform by pipelines.

Oil will be evacuated via the BP Forties pipeline system. Gas will go through the Fulmar pipeline to the Shell/Esso plant at St Fergus.

Upheaval in Soviet Union

Brent crude oil prices on the London International Petroleum Exchange soared by almost $2 a barrel on 19 August because of fears that the Soviet oil supply could be disrupted following a coup which has overthrown the government.

As Soviet Premier Mikhail Gorbachev was placed under house arrest by hard line communists, prices rose from $19.50 a barrel to around $22.

Soviet production for 1991 was already expected to fall to 508 million tonnes from 580 million tonnes last year.

But after three days the crude oil price stabilised back down to its previous level as Premier Gorbachev returned to power after the coup collapsed. On his return from the Crimea he was welcomed by Russian Federation President Boris Yeltsin, who had led the anti-coup resistance.

Columba break

In a bid to encourage the development of North Sea marginal fields, the government has made a dramatic change to its tax policy by paying back royalties to companies wishing to develop the Columba area.

The Department of Energy had always considered the estimated 50 million barrel field to be part of the Ninian field and so not eligible for the tax breaks enjoyed by new fields.

But now the government has accepted operator Lasmo's argument that Columba is a separate field which, without incentives, would be too risky to develop.

Chanter field

The Department of Energy has approved EE Caledonia and partners' Chanter field development, located about 120 miles northeast of Aberdeen in UK block 15/17. The developers are to spend £13.4 million linking the field to the Piper B platform via a subsea satellite.

The two reservoir field, estimated to have oil, condensate and gas reserves of around 13 million barrels oil equivalent, will be developed in two phases. The first, oil, reservoir coming on stream next summer.

New marketer

Amoco has agreed to supply about 20 million cubic feet of gas per day from its interests in southern North Sea fields to new gas marketeer United Gas.

Gas from Amoco's share of the Indefatigable and Leman fields — previously sold to British Gas — has been made available to accelerate competition in the UK gas market.

United Gas — a joint venture formed this year by UtiliCorp Energy and Norland Gas Marketing Ltd — will transport the gas to market through existing British Gas pipelines.

The Institute of Petroleum

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The Institute of Petroleum Pocket Diary 1992

Orders are now being taken for the **IP 1992 diary.**

The 1992 IP diary contains 32 pages of specially printed copy, including oil industry statistics and conversion factors, the addresses of many oil companies and related organisations, and information about the Institute of Petroleum itself.

Arrangements can be made for a company's own preliminary pages to be printed and inserted in the diary and the company's logo to be embossed on the cover, which this year will be Burgundy Bonded leather with the IP crest and the year embossed in gold.

The diary will be available in early November. Orders requiring company logos and preliminary pages should be placed now or, at the latest, 8 weeks in advance to allow for their preparation.

UK Prices

The cost of a **single** diary in the UK is **£6.50** (inc. VAT and p&p)

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Notice to Members

Nominations for Council 1992

Article 29 of the Articles of Association states, inter alia, that the Council of the Institute shall consist of:

(a) A President and three Honorary Officers.

(b) The President-Elect or the Past President.

(c) Fifteen ordinary members of Council of whom no fewer than three shall be in the class of Member and no fewer than three (whether Fellows, Members or Student members) shall be under the age of 35 on their most recent election.

(d) Three Branches Committee/Council nominees.

(e) Up to six additional members as may be nominated by Council.

Members of Council referred to in (c), (d) and (e) above are elected for three years, after which they retire at the Annual General Meeting and are eligible for re-election. No such member may remain on Council for a continuous period of more than six years.

There are vacancies for ordinary members (see (c) above) for the election in 1992. Some of these vacancies are caused by the retirement of members of the Council as listed below.

Nomination forms can be obtained from me and *must be returned to me by 31 December 1991.* The nomination form must be signed by a proposer, six other members, and the nominee. No member may sign more than one nomination paper as a proposer or supporter.

Should the number of nominations exceed the number of vacancies, a ballot will be held and further details will be issued to members.

Name	*Company*	*Field of Activity*	*Class of Membership*
*E. Gillatt	Elf Oil Ltd	Lubricants Technology	Fellow
B. S. Goodland	Texaco Ltd	Director, Safety & Environmental Affairs	Fellow
D. S. B. Jamieson	Edinburgh Venture Enterprise Trust	New Venture Promotion	Fellow
*P. M. Johnson	Dorset Enterprise	Service Industry	Fellow
M. J. Price	Esso Petroleum Co Ltd	Research Management	Member

*Eligible for re-election.

Vacancies exist for Under 35 Members.

August 1991

A. E. H. WILLIAMS

Director General

(Articles 29-31 and By-Laws 52-57 cover the election of Council members.)

Strathspey contract awards

Four contracts worth approximately £80 million to cover pipeline supply and installation, subsea trees and electro-hydraulic control systems for the Strathspey field have been awarded by the operator, Texaco North Sea UK Company.

The pipelay contract — covering the installation of all pipelines related to Strathspey and valued at some £35 million — has been awarded to Stena Offshore Ltd.

Stena will be responsible for all installation engineering, pipelay, trenching, and for pigging and hydrotesting work. It is intended that all pipelay, including the 16-inch gas export line, will be carried out by the reel ship *Stena Apache*. Work is scheduled to commence in May 1992 with completion in October 1992.

British Steel will supply the linepipe materials valued at over £13 million, which will cover the production of some 145 kilometres of linepipe. The contract comprises:

- Four pipelines — two production lines (10-inch and 8-inch) and two test lines (8-inch) — extending from the Strathspey manifold to the Ninian Central platform, a distance of 15.5 kilometres.
- A 12-inch water injection line from Ninian Southern to the manifold, a distance of 20 kilometres.
- A 16-inch gas export line from Ninian Central to Brent A, a distance of 26 kilometres.
- Two additional 3-inch and 4-inch lines from Ninian Central to the manifold to provide chemical services for the manifold.

The contract requires all pipelines to be anti-corrosion coated. A phased delivery schedule will commence in October.

Cameron Ironworks Ltd, of Leeds has been awarded the £22 million contract to supply 19 subsea trees and well-head systems. The trees will be designed with a 5-inch tubing and a 2-inch annulus bore and rated to 10,000psi. Work on the trees and well-head systems is to commence immediately and first delivery is scheduled for late 1992.

The controls contract has been won by Aberdeen-based FSSL Ltd. Valued at some £8 million, the contract is to supply the multiplexed electro-hydraulic systems which will control the manifold valves and subsea trees.

The master control centre, when constructed, will be installed on the Ninian Central platform. Engineering work will start immediately and delivery will be phased in with the subsea trees delivery programme, from Autumn 1992.

Patent action

An appeal by Acme Signs & Displays Limited to the Court of Appeal was dismissed on 31 July. The court upheld the decison of Mr Justice Aldous in June 1990 that AC Edwards plc's British patent No 2 139 391 — which covers its manual digital display system — was valid and was infringed by Acme's manufacture and sale of their flipover price-change system.

An injunction to restrain further infringement, which had been suspended pending the appeal, now comes into effect. Acme did not ask for the suspension to be continued, although they are allowed to deliver complete gantries already manufactured at the date of the Court of Appeal's decision.

Oil recovery

North Sea oil production has bounced back from a two-year low of 1.37 million barrels a day (b/d) in May and is set for recovery, according to the Royal Bank of Scotland.

Output returned to 1.6 million b/d in June, as production of major fields came back on stream following safety-valve installation and maintenance work.

Fields like Brent, Magnus and Forties all showed big increases after being shutdown earlier this year because of Department of Energy deadlines.

Typhoon deaths

Rescue services were unable to save three Britons and a New Zealander trapped in a diving chamber when a barge capsized in the South China Sea.

A fourth Briton is among 10 men missing in the accident in which oil rig barge DB29, operated by McDermotts, went down after being hit by a typhoon.

Algeria opens door

Algeria is to liberalise its oil exploration policy in a bid to attract more foreign oil and gas companies into the country in order to boost production.

Prime Minister Sid Ahmed Ghozali has proposed a radical change in energy policy which would permit oil companies to buy a stake in producing fields.

Mr Ghozali hopes this will help Sonatrach, the state oil and gas company, boost secondary recovery and raise production especially around the Hassi Messaoud field.

Foreign companies have invested $500 million over the last five years. If a new 'double-taxation' agreement is agreed with the United States, even more investment should follow.

Bitumen from shale

Further development of Queensland's vast shale oil deposits comes with the announcement that two Sydney-based exploration companies are planning an innovative approach to the high-quality asphalt shales deposits, 140km southwest of Clermont, Queensland.

The companies, Esperance Minerals and Greenvale Mining, plan to produce bitumen. At present 90 percent of bitumen used in Australia is imported because Australia produces very little of the necessary heavy crudes (see *Petroleum Review*, June 1991).

The production target of 200,000 tonnes of bitumen a year equals about 17 percent of Australian bitumen consumption, or the whole of Queensland's share of that total.

Indonesia enterprise

Enterprise Oil has announced that its Camar Field offshore Indonesia has come on stream. The field is located in the Bawean Block in the Java Sea. Enterprise operates the block on behalf of itself and partners Kuwait Foreign Petroleum Exploration Co (25 percent) and Samedan Oil of Indonesia Inc (15 percent).

This is Enterprise's first operated field outside the United Kingdom to come into production. The field is expected to be producing around 16,000 barrels of oil a day by October and has a production life of seven years.

Camar's output underpins Enterprise's commitment in Indonesia and will contribute to the company's current worldwide production, which is forecast at 130,000 barrels of oil equivalent a day this year.

Iraqi and Kuwait oil—one year after the invasion

By Mark Scruton

Almost to the day that Iraq invaded Kuwait last year the Norwegian supertanker *Thorness* left Kuwait's Mina al-Ahmadi terminal carrying the first crude oil to be exported from the war-damaged country since the Gulf War. As the 261,000 tonnes tanker slipped away from the partially-repaired North Pier — the only pier currently functioning — it signalled the return of Kuwait into the oil exporting community. This small start marks the end of a frantic four months during which time immense efforts were made to repair part of the Kuwaiti oil infrastructure devastated by Saddam Hussein's retreating troops.

The Iraqis started over 600 oil well fires and severely damaged the country's refineries, pipelines and pumping stations, thus preventing Kuwait from resuming production — 1.5 million barrels a day (b/d) before the invasion.

Iraq's own oil production had also been halted, not because of the damage caused by the coalition air strikes, but because of UN economic sanctions — although these are likely to be lifted soon. But with less damage to its infrastructure, Iraq is in a much better position to begin exporting than Kuwait. Within a month of the end of fighting, Iraq began producing 200,000 barrels a day (b/d) to supply its own refineries and exporting crude to a Jordanian refinery at a rate of 30,000 b/d to 75,000b/d.

In a report about the current situation, James Placke, Director, Cambridge Energy Research Associates (CERA), said: 'The obstacles to resumed oil exports from Iraq and Kuwait differ sharply. For Iraq, the immediate obstacle is political opposition to allowing economic recovery to begin until it has demonstrated compliance with prior UN Security Council resolutions and so long as Saddam Hussein retains power.

'For Kuwait, the obstacle is repairing the massive and systematic damage done to its entire oil production and export system. The outlook for recovery of Iraq and Kuwait to pre-war levels of oil exports, therefore, differs significantly,'

He said Iraq desperately required the lifting of sanctions so that it could get supplies from abroad. 'Economic sanctions not only prevented immediate Iraqi oil exports and foreign exchange earnings but Iraq could not import major items of replacement equipment and technical services to repair its oil facilities until permitted under the sanctions.'

Thorness* loading at the North Pier.** ***Ben Gibson/Katz

Meanwhile, Mr Placke said the reconstruction of Kuwait was proving to be a slow process. 'Suffering from massive damage to facilities, Kuwait's recovery is being slowed by cumbersome government contracting procedures, since the Kuwait Petroleum Corporation has limited capacity to perform needed reconstruction without outside help, and by depletion of middle management due to the departure of large numbers of Arab expatriates.'

But he was optimistic. 'There is no reason now to doubt that Kuwait can, over several years, recover to at least the 1.5 million b/d of oil it was producing when Iraq invaded. How long it may take to return to its previous sustainable production capacity of 2.3 million b/d is less certain, due to damage to the Burgan reservoir from the uncontrolled release of pressure associated with the well fires ignited by Iraq,' he said.

In the long term both Iraq and Kuwait production will be affected. 'Both will have less production capacity available by 1995 than had been estimated before the invasion,' he said. He added that the oil markets will be affected once both countries, especially Iraq, start to export again. 'As Iraqi production recovers, large increments of additional oil could arrive on the market suddenly, rather

than through a gradual build-up of exports,' he said.

Diplomatic efforts

After pressure from UN relief officials, the UN Security Council has agreed to the relaxation of sanctions. Over the next six months Iraq can sell $1.6 billion worth of oil, primarily to pay for emergency medical supplies and food.

But the deal is conditional. First, Iraq will have to pay up to 30 percent of future oil sales into a fund for Gulf war reparations and other debts.

Second, the United Nations will control all oil sales and purchases, and will oversee an escrow account for oil revenue to ensure there is no abuse of the funds by the Iraqi authorities.

Third, the United Nations will monitor the distribution of food and medical supplies, a proviso backed by US President George Bush, who is determined to ensure that the Kurds and Shi'ites have access to these emergency supplies.

Even so, no oil will flow until the Council approves a report on Iraq's needs by UN Secretary General Javier Perez de Cuellar this month. There is also continuing disquiet following revelations about Iraq's efforts to conceal unconventional and strategic weapons and production facilities.

Mr Placke said: 'Barring unforseen developments, however, oil will likely begin to flow by the end of this quarter'.

Iraq's immediate production potential is estimated at about 2 million b/d — of which 900,000b/d could come from the fields near Kirkuk and Mosul in the north and 1.1 million b/d from the southern and central fields. These volumes are possible because there was virtually no war damage to production facilities in northern Iraq (and only minor damage during the Kurdish revolt). Even the significant damage to the facilities in the Zubair and Rumaila fields in southern Iraq can be made good in time by Iraqi technicians using materials already available.

Of Iraq's three export routes, only the 1.6 million b/d pipeline across Turkey to the Mediterranean Sea is operational. Turkey is likely to permit the line to operate as soon as sanctions are lifted but it cannot be used at its rated capacity. Following repair and reconstruction, Iraq has already raised the potential throughput from a war-damaged low of 600,000b/d to about 1 million b/d, even though there is damage to the major pumping station at the beginning of the line at the critical K-2 pipeline junction near Baiji. Because of damage to other parts of its crude oil pipeline system, however, Iraq probably cannot deliver more than 900,000b/d to the export line, while also supplying its northern refineries with around 150,000b/d of crude oil.

Yearly peak oil production capacity: The effects of the war
(millions of barrels per day)

	*Prewar projection 1995**	*Actual 1990*	*Estimated 1991*	*1992*	*1993*	*1994*	*1995*
Iraq	3.6	3.3	2.0	2.2	2.7	3.1	3.3
Kuwait	2.5	2.3	0.2	0.8	1.5	1.8	2.0
Neutral Zone	0.4	0.4	0.2	0.3	0.4	0.4	0.4

Source: Cambridge Energy Research Associates

Note: *From Cambridge Energy Research Associates multiclient study, *The Capacity Race: The Future of World Oil Supply,* December, 1990.

Table 1

Iraqi damage

Apart from the damage to pumping stations, there has been other damage to Iraqi oil installations. More than half of the gas/oil separator plants in the southern oilfields, especially Rumaila, were destroyed or damaged, requiring a considerable amount of repair and replacement.

Following the Iran/Iraq war, the Mina Al-Bakr terminal was repaired and returned to service in stages at half its 1.6 million b/d design capacity. It was heavily damaged again during the recent coalition bombing. Repairs are now expected to take 10–18 months from the time they begin. Also if the IPSA line across Saudi Arabia is not available, the terminal may have to be rebuilt in order to have more of the original capacity in service.

The IPSA II pipeline system was commissioned in January 1990 to provide an independent Iraqi pipeline in Saudi Arabia (IPSA) to the Red Sea, replacing the IPSA I temporary connection from southern Iraq to the Saudi Petroline from the Eastern province to Yanbu. The 1.65 million b/d capacity system was shut down following the imposition of UN sanctions a year ago and has remained unserviced and full of high sulphur crude oil ever since. Consequently, fouling of the line and corrosion damage may have occurred.

Another complication is that the line's first pump station in southern Iraq was damaged during the war and will require major repairs. Without this pump, the line's capacity is reduced to about 400,000b/d. The line could remain closed for sometime even if the pump station is repaired and UN restrictions are lifted, because it is up to Saudi Arabia to determine when and under what conditions the IPSA pipeline may reopen.

Kuwait: slow progress

Damage to Kuwait's oil industry differs greatly from that of Iraq. In Kuwait, not only was damage from the war itself much greater but the systematic destruction of installations — from the well to the terminal — by the Iraqis has left the infrastructure in ruins. Most dramatic were the 600 or so well fires started by the Iraqis.

Reports of progress on extinguishing the well fires in Kuwait vary widely. CERA's view is that about a half of the

Estimated oil export capacity: Possible market impact
(millions of barrels per day)

Year-end	Iraq	Kuwait	Neutral Zone	Combined Exports Additional	Combined Exports Total
1991	0.5	0.1	0.2	0.8	0.8
1992	1.6	0.7	0.3	1.8	2.6
1993	2.4	1.4	0.4	1.6	4.2
1994	2.8	1.7	0.4	0.7	4.9
1995	3.0	1.9	0.4	0.4	5.3

Source: Cambridge Energy Research Associates

Note: With a return to approximate prewar production capacity in 1995, exports from Iraq and Kuwait could be greater than prewar due to reduced domestic consumption resulting from decreased economic activity.

Table 2

initial wells burning in Kuwait have been put out. They estimate that nearly all the remaining fires will be out by the end of this year, with the likelihood that only a few very high pressure, high volume wells will still be burning by then.

But as the highly visible task of extinguishing the well fires proceeds, other less visible work is just beginning. First, sizeable areas must be cleared of mines and unexploded munitions before engineers can complete the task of surveying all of the damage and before work crews can begin rebuilding production equipment and drilling new wells or repairing still serviceable ones.

Every element of the oil handling system in Kuwait requires attention, including the pipelines, manifolds, storage tanks and loading piers. The Sea Island loading terminal, located in water deep enough to accommodate 530,000 ton tankers 10 miles into the Gulf off Mina al-Ahmadi, has been badly damaged and may need to be completely rebuilt. The original, relatively shallow, South Pier at Mina al-Ahmadi also sustained significant damage but the deeper draught North Pier is serviceable on at least a limited basis. It can accommodate Very Large Crude Carrier (VLCC) class tankers of up to 300,000 tons.

CERA says it should be possible to restore processing, transportation, storage and export facilities in parallel with (or ahead of) oil well repairs. Whether this will be done, however, is not fully within the control of either the Kuwait Petroleum Corporation (KPC) and its subsidiaries or its prime contractors.

Mr Placke said: 'The Kuwaiti government, while in exile, instituted an extraordinary set of contracting procedures and disbursement controls, overlaying established arrangements, which have proved to be unusually cumbersome and have been one of the factors inhibiting progress on Kuwait's overall recovery.

'These appear to apply to the vital oil sector as much as they do to routine government procurement. While steady progress can be expected in rebuilding Kuwait's shattered oil production system, such progress is likely to be uneven and suboptimal.'

Despite setbacks, progress is being made. Most of Kuwait's initial production now comes from its Ahmadi and Magwa fields. Production is estimated to reach 200,000b/d by the end of this year, divided between local demand and exports. Virtually all the refined products, gasoline, kerosene, diesel and fuel oil, will come from the Mina al-Ahmadi refinery (370,000b/d capacity pre-war). These will be used internally although some surplus naphtha is likely to be exported later this year.

Repairing a Christmas tree in Kuwait. *Ben Gibson courtesy Katz*

Refining at the Mina Abdullah refinery (190,000b/d capacity pre-war) will not start until next year and the future of the Shuaiba (187,000b/d) is still unclear.

The production situation in the Kuwait area of the former Neutral Zone area is less clear cut. Progress has been slower than in Kuwait proper because fire-fighting operations have been hampered by a proportionally greater amount of unexploded ordnance on the ground.

But, on the plus side, many of the well fires there have gone out because of the declining pressure and increasing water content in the crude, and even though the recovery of the main onshore field at Wafra will take much longer than the fields in Kuwait, the environmental and other consequences will be less severe. Pre-war onshore Neutral Zone crude production was about 150,000b/d.

Outlook for exports

Barring extended political constraints on Iraq or worse than expected technical/managerial problems in Kuwait, CERA foresees the combined volume of exports from the two countries building up to 600,000b/d by the end of the year.

Added to this is the Neutral Zone production, which is divided equally between Kuwait and Saudi Arabia. Production from the Arabian Oil Company's offshore Khafji field resumed in early June and is expected to return to its pre-war average rate of 200,000b/d. Onshore production at Wafra is not expected to resume before next year, and then at only 50,000b/d.

The rate of increase of exports from Iraq, Kuwait and the Neutral Zone is expected to grow by 1.8 million b/d in 1992 and 1.6 million b/d in 1993, after which growth will decline sharply.

As far as the world oil markets are concerned, therefore, the greatest absorption problem will come in 1992–93. With the bulk of the incremental supply expected to come from Iraq in both years, the adjustment could well present difficulties for OPEC in revising new country quotas.

Saudi Arabia will play a key role in these discussions. CERA believes it is unlikely, whatever the character of the Iraqi regime at that time, that Saudi Arabia will help the Iraqis by permitting the IPSA II pipeline to reopen.

Consequently it will be essential for Iraq to restore all of the original 1.6 million b/d capacity at its Mina Al-Bakr terminal in the Gulf — however, that will require expertise.

'In the end, if price-depressing export volumes are to be avoided, while permitting Iraq and Kuwait to recover from the war as quickly as they are able (and Iraq to meet its compensation and foreign debt service obligations) co-operation among the leading OPEC exporters — with Saudi Arabia in the forefront — will be required to realign market shares to some extent,' said Mr Placke. ■

We acknowledge the assistance of James A Placke, Director of Cambridge Energy Research Associates. A Middle East specialist and former US Foreign Service officer, he has written a report, *Oil Exports from Iraq and Kuwait: How Soon, What Volumes?*, published in June.

Advances in slimhole drilling

By John Howes

In the mid 1960s, a number of companies began to experiment with a novel drilling practice of drilling onshore wells of a substantially reduced diameter. While partial successes were recorded, these extraordinary methods were never fully accepted by the oil industry. In the light of contemporary advances in drilling technology and the demands to reduce drilling costs, however, a number of oil companies have begun to re-evaluate the technique.

A reduced diameter hole gives a number of potential advantages, perhaps the most important being cost. For example, on its six-well slimhole drilling evaluation programme on the Plungar field, BP announced savings of over 25 percent of the cost of drilling a conventional well.

Similarly, slimhole drilling is ideal where a low impact on the environment is important, such as in residential areas or sensitive locations. One slimhole system can drill from a site only 25 by 30 metres in area, with sound level of only 60dB at 50 metres from the rig. The reduced size of equipment can be transported readily between locations using a smaller number of trailers or, in the case of work by Conoco in Irian Jaya, by helicopter.

Slimhole drilling system does not require the same amount of staff as a conventional drilling unit, with one system requiring only six people per 24 hours, which results in cost savings in personnel transport and support.

Slimhole drilling uses a minimum of raw materials (which are a contributory factor of the smaller well costs) and decreases the amount of waste products for disposal. From calculations by Amoco, a 66mm diameter hole, 500 metres in length, for example, would contain only 11 barrels mud volume. A surface tank of only 30bbl would be therefore sufficient for drilling operations.

Slimhole wells

A slimhole well has been defined as one in which 90 percent or more of its length has a diameter of less than 7 inches. It has been estimated that over 1,000 slimhole wells were drilled last year, mostly in the United States, and the majority being sidetracks of wells that were originally drilled with conventional diameters. In Europe, a number of companies including BP, Shell, Total, Elf and Agip are all working to establish slimhole drilling.

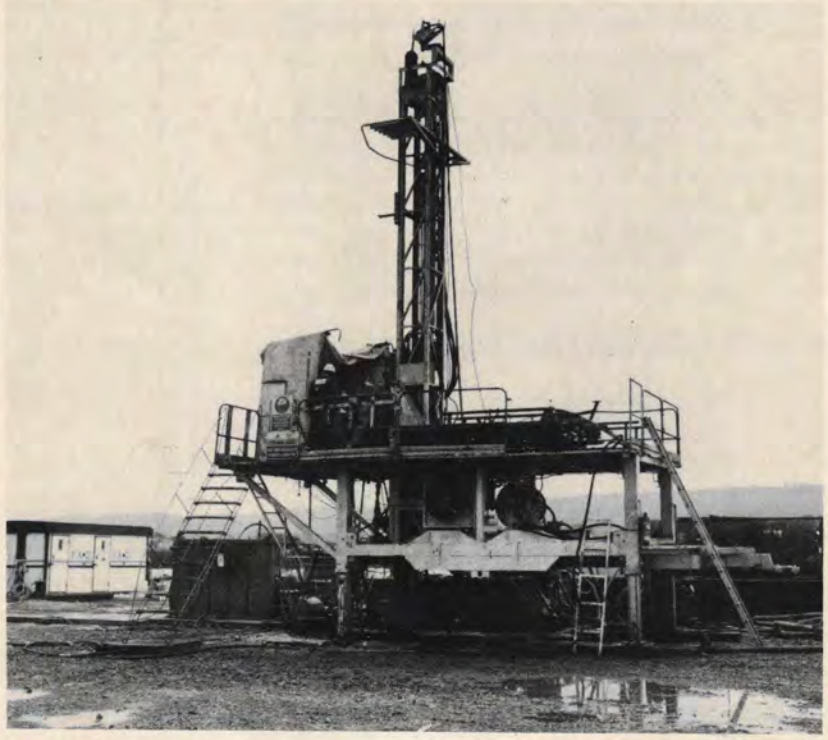
Cost comparisons between slimhole and conventional drilling in $/ft.

	Slim hole	Conventional
Alaska	655	1224
Pakistan	32	193
Kenya	211	338

Source: Amoco

BP is following up its Leicestershire wells with a programme in Africa. Shell, in collaboration with Deutag, is conducting research with the aim of making slimhole drilling commonplace by the end of the decade. Elf intends to carry out further wells either with another company or independently and has carried out research at its Le Fourcq establishment near Boussins.

The world leader in the field, however, is perhaps the Oklahoma-based Amoco Production Company with their Stratigraphic Highspeed Advanced Drilling System. With the aim of drilling more slimhole wells, the Canadian company, Dreco, is presently building a slimhole rig.



'Microdrill' rig system.

Two main methods of achieving the slimhole diameters have evolved. One is by using a scaled-down version of a conventional drilling system and the other, by adopting 'continuous coring' technology, commonly used in the mining industry.

Typical of the scaled-down drilling system are the Microdrill system and Forasol's Foramatic system. The Swedish-based Microdrill system has conducted a number of drilling operations in Europe and North Africa. The rig itself is only 11 metres in height, with a maximum drilling depth of 1,500 metres.

Instead of a kelly, a hydraulic rotating torque head is used to drive the 3 metre lengths of drill pipe. Microdrill have developed a range of drilling and testing equipment including miniature bits of 46mm to 145mm diameters, internally upset/externally flush drillpipe of 41mm to 75mm diameters and collars (46–70mm dia) as well as wireline logging tools to meet the demands of reduced diameters. When tripping, these joints are commonly racked in the mast in sets of triples.

More recently, Forasol converted two WN Apache drilling units into semi-automatic rigs and automatic rigs and have used them in the drilling of the Paris basin. These Foramatic rigs exhibit a 64ft derrick with a hydraulic power swivel that allows rotation and circulation while tripping, thus reducing potential stuck pipe and costly fishing jobs.

Continuous coring

The second technique, 'continuous coring' in which up to 90 percent of the well is cored, was adapted from the mineral mining industry. This is broadly analogous to conventional oilfield coring procedures, with the rock passing into an inner barrel for subsequent retrieval. Instead of the entire string being tripped to the surface to recover the core, the 5–20ft continuously cored sections are retrieved by wireline running inside the string. Once the core is taken, the wireline stabs on to a spear point top of the inner barrel and the barrel is pulled to the surface through the drillstring. At the surface, the inner barrel is laid down and replaced by another barrel, dropped or lowered to bottom. Up to 100 percent recovery is achieved across a wide range of formations.

In some cases, the availability of a core record of the well is an advantage, particularly if the reduced diameter or high angle does not allow a full wireline logging suite to be carried out. In other cases, the facilities physically to handle and analyse thousands of feet of core are not available.

'The advantages of having a full section of core are not yet fully understood. Explorationists seldom have had the convenience of examining the geology as it really exists,' said a spokesman.

He said that putting the information to optimum use will take time and imagination to develop.

The substantial volumes of core however has prompted Amoco to set up an automated, analytical, core-processing system. This included a mechanical apparatus to convey, clean, cut, label, and temporarily store the cores while maintaining their cored sequential order. Each core passing through the module is washed and dried, and subjected to a variety of geological analyses including gamma scan, saturations, porosity, magnetic susceptibility, mineralogical composition and hydrocarbon determination. A video of the entire core was made, and a microscopic video analysis made at various points.

Helilift in action in Irian Jaya.

Technical problems

While the slimhole concept has many economic advantages, it has also a number of problems that have to be either circumvented or solved by research. One such is in the development of a suitable mud system.

In the mineral mining industry from which continuous coring is derived, the non-reactive rocks allow water to be used as a drilling fluid. In a sedimentary environment however, water is often unsuitable particularly when drilling clays, and a solids-based mud system commonly used in the oil and gas industry is necessary.

At fast rotary speeds however, the system acts as a centrifuge, and particles within the mud have a tendency to plate on the inside diameter of the drillstring. This effectively provides a ceiling to the mud weight that can be used, and therefore may leave the hole susceptible to potential well control problems if an abnormally pressured rock is drilled.

A further problem is that the annulus in a slimhole well is commonly only 0.5 inches. Messrs Millheim and Walker calculated that a two-barrel kick taken in a conventional well of 8,000ft would rise 40ft in the annulus and reduce the bottomhole hydrostatic pressure by about 15psi. A two-barrel kick in a slimhole annulus, however, would occupy 375ft and reduce the hydrostatic pressure by about 120psi.

This would mean that even the most modest fluid influx could cause significant well control problems but be very difficult to detect by the conventional practice of observing a gain in pit volume. The solution may be the employment of highly sensitive flow meters to detect sudden surges movement in the fluid. Meters sensitive to the displacement of 60ft of drillpipe in the well (0.1 to 0.3bbl) are presently available.

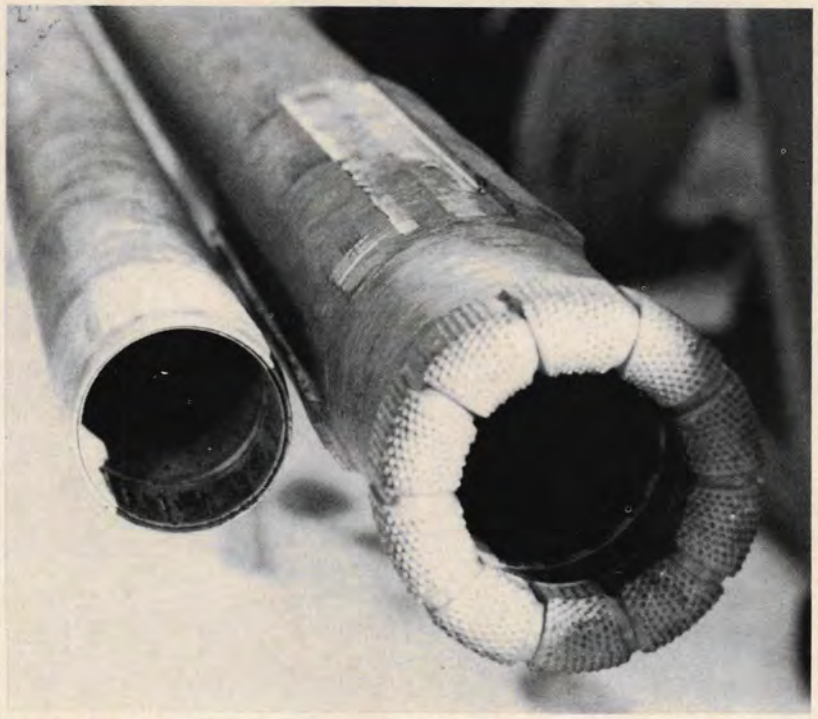
Full-scale test system

In order to understand more fully aspects of slimhole wellbore physics and, more particularly determine the precise mechanism of kicks, Amoco designed and built a full-scale test system. This was a steel casing with a $4\frac{3}{8}$ inch ID, into which was attached eight $\frac{1}{4}$ inch pressure transmission lines at strategic points along its length. At the base of the casing, a 1 inch line introduced nitrogen to simulate the kick. Amoco carried out tests to analyse flow data to determine signatures of various wellbore phenomena and a well control system was

developed based on artificial intelligence.

After the kick has been detected, the next step is to kill it. Through experimentation, it has been determined that three main parameters — flow rate, rotary speed and mud properties — are responsible for the effective downhole pressures. One test showed that a given 8.5ppg fluid, circulated at 50gpm in an 8,000ft slimhole, produced an effective circulating density of 9.6ppg at the bottom of the wellbore. The effective density of the same mud could however be increased to 12.1ppg by simply doubling the flow rate. While rotating simultaneously at 600rpm, this density could be further increased to 16.1ppg without increasing the original mud weight. By changing flow, mudweight or rotary speed an underbalanced formation can often be controlled. Controlling pressure using these parameters is the basis of the so-called dynamic kill method of well control.

Slimhole drilling is at the stage that horizontal drilling was five or 10 years ago. A natural progression would be to combine the two disciplines and maximise the reduced costs of drilling slimholes with the engineering advantages of horizontal wells.



Slimhole core bit and inner barrel.

There is much work to be done, yet the rewards are potentially huge. Amoco have estimated that with no previous experience, it would be possible for an operator to assemble the required equipment in order to drill their own slimholes safely to 6,000ft within three to six months. ■

Open windows on production

By Alan Jardine, Senior Consultant, SD-Scicon.

Once there was a well . . .

During its childhood, oil production from the field was by means of one, rapidly followed by several more, naturally flowing oil wells. Oil was valuable, gas and labour cheap. Later, as reservoir pressure fell, artificial oil lift in the form of beam pumping and gas re-injection became necessary. The field was delineated and was found to have considerable geographical extent and be surrounded by smaller, marginal fields in inhospitable terrain. Labour costs were rising but gas did not yet have a viable, local market. Nor did gas products.

As field production extended — even into the shallow waters adjacent to the province — pipelines were laid to transport the produced petroleum to gathering and separation stations, to tank farms and to tanker loading complexes. The pipelines were monitored by Supervisory Control and Data Acquisition (SCADA) systems. Large sections of the field were controlled from a small number of control centres, to which production information was transmitted by yet more computer monitoring systems. This resulted from pressures on the oilfield operator to use its personnel more efficiently and to reduce the physical risk to those personnel of travelling to and working in dangerous parts of the field. Environmental pressures, too, required the operator to monitor more and more points in the field in order to check line breaks, pressure surges and oily water disposal.

Against that background, as information technology advanced and SCADA suppliers fell into and out of the operator's favour, a medley of different, incompatible SCADA and other monitoring systems proliferated across the field. They became unreliable and were fearfully expensive to maintain in good order.

Then a production complex

In recent years, a buoyant world market for gas has persuaded the operator to construct a gas processing plant to accept surplus gas production from the field. Gas will be sold as domestic fuel and gas products exported via a new natural gas liquids (NGL) storage and export plant.

Now in its prime, the field has become a fully integrated production complex, requiring rapid decisions on complicated issues — such as the optimising of gas disposals — to be made with cognisance of the profitability of the whole of the business. Optimum decisions can only be made by using current detailed information from many parts of the operation: from wellhead to trading desk, from tank dips to shipping schedules.

The information exists, of course. It hides in dozens of different SCADA report formats; it is being scratched out on charts by tens of circular recorders; it lives in a score of hand-written shift logs and in a hundred operators' heads; it is copied on telexes and faxes.

It does not exist where it is most needed: on the decision-maker's desk.

Bringing the information

Throughout the 1980s it became technically feasible to interface a manager's desktop computer to most of the host of SCADAs, RTUs, alarm panels, Distributed Control Systems and the other paraphernalia that abound in the mature oilfield, and to consolidate that information on a single computer screen. The process basks in the formal name of 'Systems Integration' and has in recent years been advocated by the computer industry as the cure for all the evils of dispersed information being experienced by our operator.

Systems Integration, in the accepted sense, involves the wholesale analysis of an organisation's data, and the 'views' of that data that will be needed by every user of the system. This is an arcane, difficult, and (in the nature of such things) expensive process. Further, it does not allow for the phased integration of existing computer components into the new system (old computer systems' databases are badly structured — or not structured — and are probably no longer documented). Phasing this integration is, of course, of critical importance to our established operator, who needs to produce oil and gas, safely, throughout the integration work.

Moreover, the Systems Integration process is inflexible. Unpredictable operational problems require unpredictable decisions to be made. Unpredictable decisions need unpredictable views of operational information.

Day	*Time*	*Last HR BBL*	*Last HR MMSCF*	*TMP F*
03	0600	178.9	179.2	239
03	0700	180.5	180.5	238
03	0800	181.5	182.2	238
03	0900	188.7	193.2	239
03	1000	190.9	203.2	244

Scroll Bar

Figure 1: Field production report — well CHD16

The window

In 1982, a group of computer specialists working at the Massachusetts Institute of Technology (MIT) decided to turn round the traditional way of displaying information on a computer screen. Rather than have a single computer programme take control of the user's only screen, they reasoned, why not give him or her the power, through suitable technology, to organise the physical screen in such a way as to display as many portions of selected information from several programmes of interest as s/he wished? (Subject to the physical limitations of the device's capacity and human eyesight.)

The technique became known as windowing. Driven by a need to economise on (then) expensive display hardware, the technology found favour with many system developers and users because it provided them with the following benefits:—

- the ability to switch rapidly between two or more views of the system
- user control over the orientation of information, according to what was of most interest at the time
- a means of rapidly scrolling through large volumes of computer output (as favoured by earlier computer systems) in order to find the one or two items of interest
- the capability of presenting information from different parts of the system in the form of graphs
- a facility of rapidly calling up new information, from different components of the system, simply by pointing with a hand-held device (rather than learning command codes or strings of computer syntax).

In short, windowing provided on-screen information integration. (An example is shown in **Figure 1**.)

Small-scale implementations of windowing can be seen on any Apple Macintosh computer, or other personal computers which use Microsoft Corporation's 'Windows' product.

The window opens

Windows, and the on-screen data integration they provide, do not themselves solve the problem of transmitting plant data from existing, old computer systems. Traditionally, this problem has been solved by developing special interfacing software to receive information from old system 'A' and send it to new system 'B'. This is not always a simple, dependable, or inexpensive activity. Our operator's Information Systems Manager, developing a strategy for upgrading the field's data collection system and concerned with the new system's long-term viability, was concerned about how often this process would have to be repeated in the future – a concern which is shared by many other industries.

The concern was allayed by the concept of 'Open Systems'. In 1988, yielding to customer pressures, several major manufacturers of computers (Digital Equipment Corporation, Hewlett Packard and others) formed the Open Systems Foundation (OSF). This foundation is dedicated to the production of computer products which adhere to industry-wide standards for computer operating systems, communications and windows. The goals of OSF are to deliver to purchasers of computer systems the benefits of vendor independence, better price and performance, software portability and efficient development tools.

Open Systems and windows together provided a timely roadmap for building a new production information system for our oilfield operator: a system which furnishes a common user interface, is capable of delivering information from any part of the operation to a single workstation and will survive the development of new computer technologies into the foreseeable future **(Figure 2)**.

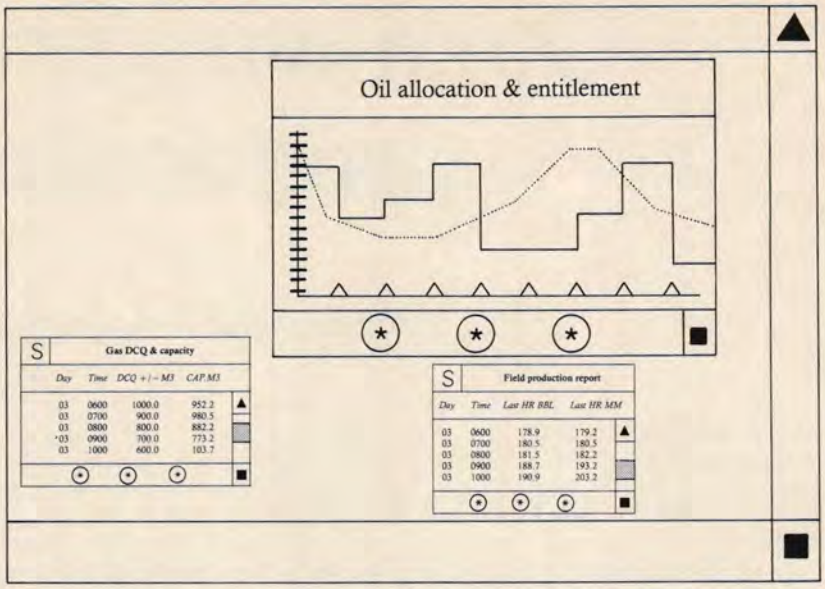


Figure 2: Mature production complex

Through the open window

Through Open Systems and windowing the operator is now able to operate the integrated production complex more effectively, and with far better profitability than would have been possible with the systems of yesterday. Specifically:

- The number of people required to operate the ever-increasing number of production wells has been measurably reduced.
- Notwithstanding this impressive increase in labour productivity, wells are better managed. Through the early, automatic detection of well abnormalities, maintenance resources can be deployed optimally.
- In concordance with this, pumps, wells and the reservoir are better protected: aberrant pumps are simply switched off by the computer while they await the arrival of the maintenance team.
- Safety has been significantly improved, through the reduction in field trips, and the improved route planning of maintenance journeys.
- Improved monitoring of effluents and leaks from the entire complex has reduced risks to the environment.
- The planning and scheduling of gas disposals is much more efficient, since all information about gas availabilities and demands (for re-injection, fuel usage, contractual domestic supply and for liquefaction) is now available on the planner's workstation.

Truly the operator has an open window on production. ■

IFEG

NEW DEVELOPMENTS IN INFORMATION TECHNOLOGY FOR THE ENERGY INDUSTRIES

14 November 1991

A one-day conference to be held at The Institute of Petroleum

The following papers will be presented:

Chairman: Mr Andy Dawson, Manager Information Services, Taywood Engineering

Information and Records Management in an Electronic Age
Tony Hendley, Technical Director, Cimtech

Online Energy Information — A survey and up-date of databases
Stephen Culshaw, Information Officer, British Library, Science & Technology Information Service

Document Image Processing — applications for the oil & gas industry
Nada Zdravkovic, Account Manager, Energy Sector, Integrated Documatics Ltd.

CD ROM versus Online Access
Dan Re'em, Specialist Publisher and Consultant

Applications of Interactive Video and Multimedia Technology in Safety Training
Dr Peter Chatterton, Daedalus

Advances in Electronic Mail and Document Distribution
Charles Bell, IBM (UK) Ltd, Oil and International Branch

The Next Five Years — A Look into the Future
Julia Dickmann, Sales Manager, Supermax Library System UK, Dansk Data Elektronik

Exhibits from: Oil Patch Directory, Longman World Energy CD ROM, IDL Document Image Processing, IBM, Dialog OnDisc CD ROM, HSE LINE CD ROM and Infoil/ Sesame Database.

For further information, and a copy of the registration form, please contact **Caroline Little, The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR, UK.**

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

IP

The Institute of Petroleum

Remediation of Industrial Sites

22 October 1991

A one-day conference to be held at

The Institute of Petroleum, London

The remediation of polluted industrial sites has now become a major environmental issue. Technologies for the clean-up of soil and ground water contaminated by petroleum products and chemicals includes remediation techniques that can leave sites intact. This conference will discuss the development application of these techniques and some case histories.

The following papers will be presented:

UK Legislation and Developments
Dr Judith Denner, Department of the Environment, Contaminated Land Branch, Local Environment Quality Division

European Approaches to Contaminated Sites
Dr G Edulgee, Environmental Resources Ltd

Petroleum Industry View of Contaminated Sites
Ir B Horvat, Shell Internationale Petroleum Mij BV

Site Assessments and Analysis Strategies
M James, Land Restoration Systems

Soil and Groundwater Remediation Technology Overview
Dr P Wood, Warren Spring Laboratory

CASE HISTORIES

1 **Bioremediation**
Dr P Barratt, Biotreatment Ltd

2 **Bioremediation**
A de Boer, Nederlandse Aardolie Maatshappij BV

3 **Physico-chemical methods — Venting**
J Harrison, Delft Geotechnics UK Ltd

4 **Alternative Physico-chemical methods**
Dr MA Smith, Clayton Environmental Consultants

For further information, and a copy of the registration form, please contact

Caroline Little, The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR, UK.

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Secret goings-on in wartime

Interest in a World War II oil project, kept strictly secret at the time for obvious reasons, has been revived largely as a result of a surge in interest in Oklahoma, which was sparked off by the British MP, Mr Tony Speller, when he addressed a meeting of the Energy Advocates, a group of oil executives in Tulsa.

As a consequence, Mr John Wakeham, Secretary of State for Energy, unveiled a statue and commemorative plantation in Nottinghamshire earlier this summer. He said, 'The Oklahoma oilmen made a crucial contribution to keep Britain in the war. This operation, which at its peak involved over 1,200 US and British men and women, produced oil from onshore wells and was described as "supplies which the 'U' boats could never sink" '.

'The history of this project is fascinating', said Mr Speller. He told *Petroleum Review* that the D'Arcy Exploration Company, a subsidiary of the Anglo-Iranian Oil Co., had found oil at Eakring close to the edge of Sherwood Forest in 1938 — the first commercial onshore oil discovered in the United Kingdom. This was not disclosed publicly in case enemy intelligence heard of it and directed an air attack on the area.

The volume of oil initially found was small, yielding some 700 barrels per day of high grade crude. However, the company ran into various problems in the early years of the war partly because its drilling equipment was designed for operations in Persia. Heavy drilling outfits originally intended for deep-well drilling were not very suitable for the rapid drilling of the relatively shallow production at depths of around 2,000 feet. Moreover, there were personnel shortages — military needs took preference — as well as shortages of steel, which was being requisitioned for munitions and shipbuilding, and import restrictions, affecting equipment and spare parts.

But the desperate shortage of fuel dictated full-speed ahead for the development of the oil discovery.

Although the volume of crude which could be produced in the Midlands woodland was small, it was exceptionally valuable in wartime, as it was located close to military airfields and involved very little transportation. In this period, oil supplies from the Middle East were being interrupted and diverted, while convoys of equipment likewise ran the risk of being attacked and sunk. Moreover, the leafy oak trees of the forest which had sheltered Robin Hood and his men provided natural camouflage, while the location virtually in the centre of England made the oilfield hopefully immune from enemy attack.

Mr CAP Southwell of D'Arcy (later Sir Philip Southwell CBE, MC, and IP President) believed that production could be perhaps quadrupled and that the area had potential for further discoveries. Initially, Canadian assistance was sought and obtained for the construction of access roads through the forest to the drilling site at Duke's Wood.

In view of the wartime conditions, D'Arcy was short of personnel with oilfield experience to work in Britain. It employed a small nucleus of its own staff who were ex-Persia; otherwise, it could only call on a pool of pensioners or those with industrial injuries who had been rejected by the forces.

With official backing from the government, in particular the Secretary of Petroleum, Mr Geoffrey Lloyd, he travelled (with considerable difficulty and personal risk) across the Atlantic in his search for more and improved drilling equipment and especially the latest models of rotary rigs.

Since D'Arcy could not buy this much-needed equipment, it was suggested that a US drilling contractor should be engaged to drill in England. After some initial reluctance, two companies, Noble Drilling Corporation of Ardmore, Oklahoma and Fain-Porter Drilling Company of Oklahoma City, took on this unusual contract on a cost-only basis — without knowing the exact location of the wells to be drilled. For reasons of security, it was always called the 'English Project'.

The two Oklahoma firms undertook to buy the equipment and supply the personnel. Young but experienced drillers were recruited for the 12 month contract — again under a cloak of secrecy. They were told that they would be working in a war-zone in war

Mr John Wakeham, Secretary of State for Energy (centre), with some of the American visitors in front of the new bronze statue. The funds for the commissioning and erection of the statue, sculpted by Mr Jay O'Melia, were raised largely in Oklahoma from individual and company subscriptions. Fund-raising was helped by the sale of miniature replicas of the statue, which sold at $2,500 each. Interest in the project mounted, as the unusual story behind the statue was unfolded to the US public.

On the sides of the plinth beneath the statue are inscribed all the names of the drillers who came to England as well as an acknowledgement to the help of Mr Speller who instigated the whole idea.

Of the 42 drillers who came in 1943, 16 returned this year for the unveiling of the statue. Also present were BP pensioners who had been involved as well as local residents who could still recall the distinctive wartime visitors.

conditions. Forty-two men signed up and after considerable administrative difficulties including obtaining passports and deferment from US military service, they sailed from New York in February 1943 in *HMS Queen Elizabeth,* converted for wartime use as a troop carrier. According to tradition, they also brought with them $1 million in notes in a suitcase!

Britain in wartime

Details of the drillers' work and life-style are given in *The Secret of Sherwood Forest* by Guy Woodward and Grace Steel Woodward published by the University of Oklahoma Press in 1973. The difficulties in obtaining equipment, arranging its importation at Liverpool and Cardiff, clearing it through customs and the final transport to the site make incredible reading.

The search for local accommodation for the drilling teams ended with the requisition of part of an Anglican monastery at Kelham Hall which they shared with a group of monks — the two disparate groups of men lived harmoniously in separate wings of the building, sharing special occasions such as Thanksgiving and Christmas.

Mr Lew O Ward (left) and Mr John Moran (centre), Energy Advocates from Tulsa, present a bronze replica of the statue to Mr Tony Speller, MP for North Devon.

Living and working in war-time Britain was not easy — it meant air-raid warnings, black-outs, restrictions of all kinds, shortages of everything including fuel, power and light, ration-cards, camouflage of all drilling equipment, trucks and site offices.

Gene Rosser inspecting the new statue at Duke's Wood. The oilfield had a life of 26 years, ending in the 1960s, but recently the area has been restored as an industrial archaeological nature trail by BP and the Nottinghamshire Wildlife Trust.

Surprising to many in 1943 was the speed with which the American teams drilled. The rapid completion of wells, as they struggled to reach their target of 100 wells in 12 months, was remarkable. Yet the biggest practical problem in achieving this aim was the poor food supply — the minimal rations allowed to all during wartime was obviously completely inadequate for young men doing hard physical work in 12 hour shifts, seven days a week, despite their personal efforts to grow their own vegetables and keep chickens in the monastery garden. Perhaps their hunger even forced them to resort to the black market. Finally, applications at the highest military and diplomatic levels were necessary before extra food was obtained in the form of US army food rations from the nearest US army depot to supplement the standard British rations — a very non-standard procedure since with this arrangement the US army was feeding civilian oil drillers.

At the end of the 12 months, 106 wells had been drilled, of which 94 were completed as producers. During 1943 production rose to a peak of 3,000 b/d. According to BP's figures, the Eakring oilfield contributed over 70 million vital gallons to Britain's war effort.

When Mr Southwell wrote in February 1945 in *The Journal of the Institute of Petroleum* (the forerunner of *Petroleum Review*), revealing what had gone on during the war years, he declared proudly that as a result of the accelerated exploration and production programme in the Midlands forest, 'England is a petroleum producing country'. ■

Carol Reader

Namibia opens up huge new search area

By David Buckman

A vast onshore and offshore region has been thrown open to international oil and gas explorers by the government of Namibia, the southwest African state that gained its independence early last year. Although it is the fourth largest producer of non-fuel minerals in Africa, the world's fifth-biggest uranium producer and has one of the richest alluvial diamond deposits anywhere, Namibia has so far yielded to searchers only hints of what its hydrocarbon potential might be. The new government has acted swiftly to bring in flexible legislation to tempt in explorers.

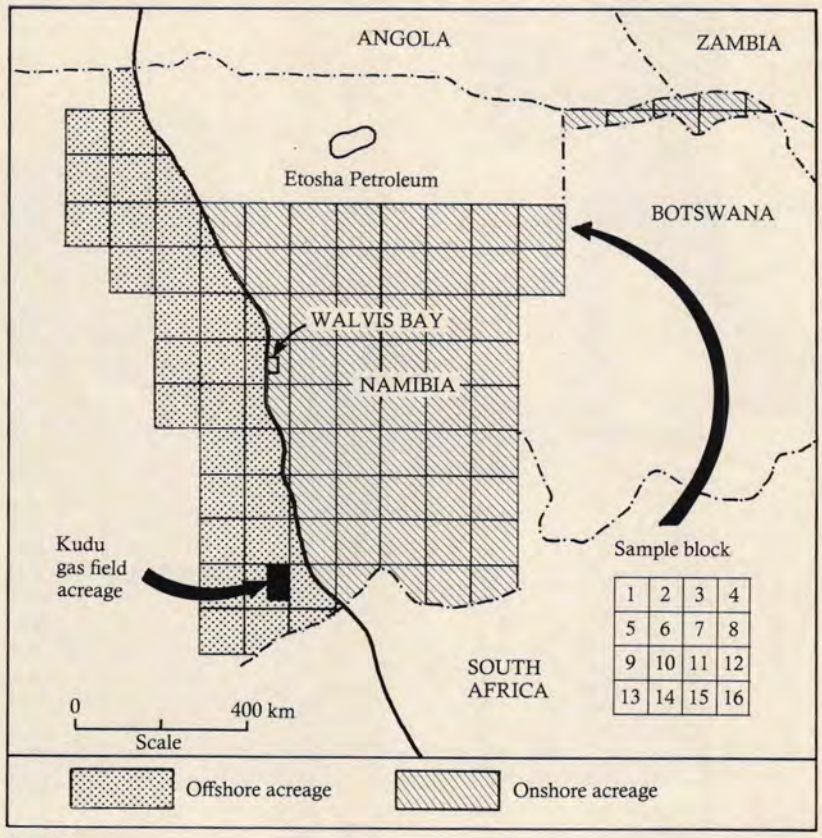
Namibia gained its independence in March 1990. It promulgated its Petroleum Exploration and Production Act in April this year, the Model Petroleum Agreement appearing the following month. In May, too, the government held two large presentations on petroleum prospects in London and then Houston which attracted dozens of companies and several hundred participants. At least 15 companies had acquired seismic data packages before the presentations began, and by the time the seminar arrived in Houston that number had reached 20. In addition to major oil companies like BP, Shell, Chevron, Mobil and Exxon, there was a good representation of independents, with a strong South African interest.

Dr Nigel Banks, head of geology and geophysics at Intera ECL Petroleum Technologies, which has advised the Namibian government on its petroleum development, told delegates in London that Namibia 'should rank very high on your exploration priorities. This is the last part of the African continental shelf which remains to be explored.'

Namibia is almost a quarter as big again as Texas. On offer is 825,000 square kilometres onshore and 194,000 sq km out to the 1,000 metre isobath — equal in all to around 800 North Sea blocks. Because so little was known about Namibia's petroleum potential, the state-owned National Petroleum Corporation of Namibia (Namcor) decided, according to its managing director Mr JJ Pottas: 'Let's open it all up and see what they're interested in. We had received indications from a lot of companies that they would apply for licences.' Areas on offer include 93 total and fragmentary blocks, with 38 either partially or completely offshore.

Onshore

Excluded from the offer, however, is one big exclusive tract in the northern onshore part of Namibia, where drilling is due to begin this month. Spearheading this search is the Taiwanese offshoot Overseas Petroleum and Investment Corporation (OPIC), which is planning to put down a single hole in a 64 million-acre tract allocated to Etosha Petroleum Company. Under a deal made early in 1989 Etosha, a subsidiary of the Atlanta-based firm Brilund Ltd, allowed OPIC to enter the search which originally dated from the 1960s. Until then little exploration had been carried out, although a test well was reported to have yielded minor hydrocarbons. Technical difficulties and guerrilla activity plagued work.



Namibia.

Terms called for Etosha to receive an 11 percent overriding royalty interest in oil and gas production, a 5 percent royalty on minerals produced and $1.49 million. OPIC obtained a seven-year term, with rights of extension, to complete its programme, as well as the right to produce and sell all oil and gas found. OPIC told *Petroleum Review* recently that it had completed 852km of seismic prior to drilling, performed by French firm CGG.

Although international attention has lately concentrated on offshore prospects, and traditionally northern land petroleum opportunities have been rated highest, Namcor is hoping that there will be a surge of new interest in more southerly onshore tracts. According to Dr Banks the Namibian onshore offers fairly easy access, with good roads and seismic crews available. 'A lot of seismic could be obtained easily, cheaply,' he said. Among a clutch of reports being offered by Intera ECL are several on the onshore sector where a limited amount of work was done by Elf and Agip in the 1970s, in effect a mere scratching of the surface.

Offshore

Offshore, Namibia's petroleum search falls into two phases. In the first, from 1968–74, it was overseen by South Africa. In 1968 extensive offshore areas were licensed for the first time out to the 200m isobath, licences between the 200m and 1,000m isobaths being awarded in 1972. The first exploration well, Kudu 9A-1, was sunk in 1973 by Chevron but although this detected gas, in 1974 a UN mandate halted exploration. Between 1968–74 about 35,000-plus km of seismic data was shot, together with some gravity and magnetics data but no more drilling was done.

The 1986 interim government allocated funds to Swakor. This was formerly the South West African Oil Exploration Corporation, later becoming a Namibian state body. Swakor in 1987 sank the Kudu 9A-2 well to try to prove the extent of the Chevron find, which yielded gas shows. The 1988 Kudu 9A-3 was more successful, proving the gas field. Drilling was done with the Foramer semi-submersible rig *Asterie*. These results led to a new bout of seismic work at Kudu from 1989 in which ECL Intera was involved, arrangements being made with Halliburton Geophysical Services to do the work. It led to Intera ECL summing up Namibia's offshore potential as 'exciting'.

A velocity survey.

Kudu gas

Just as in the North Sea in the past there have been 'golden blocks' on offer, Namibia's 'golden block' in the current offering is undoubtedly area 2814A. Each whole Namibian block or quadrant is normally divided into 16 sub-blocks. Area 2814A comprises sub-blocks 2, 4, 7, 8, 11 and 12 and includes the Kudu gas field. For this specially attractive area an early bidding deadline of 1 August was set, whereas for the rest of the territory on offer, including area 2814B, it is 1 November. August was decided on for the Kudu area 'as a good database (wells and seismic) already exists', the Ministry of Mines and Energy explained.

According to Dr Banks, there are still 'many uncertainties' about Kudu, and he reckons that 'whoever takes Kudu on is in for a very interesting, exciting time.' Although no useful tests were completed at the Chevron Kudu 9A-1 well due to mechanical problems and poor reservoir quality prevented tests at the first appraisal well, Kudu 9A-3 found multiple gas sands with fair to good reservoir characteristics, the main sand testing 38 million cubic feet per day. ECL's first survey of the field, which lies 125km offshore in 165m of water, indicated that gas in place under three models ranged from 5.2 to 17.4 trillion cubic feet. Since then more work has been done using a Landmark workstation. This has upgraded in-place reserves under the three models from 11.9Tcf to 60Tcf, a huge field in world terms. The gas is good and dry, 96.12 percent methane with virtually no carbon dioxide. But among those 'uncertainties' are that it

is still not known for certain where the field closes to the north, and 'deeper reservoir potential remains untested.'

Namibia is keen to see Kudu gas developed and earlier this year called for interested companies to come forward by 1 May with a view to getting a feasibility study on gas use under way. *Petroleum Review* was told recently that 17 companies had registered their interest, including some from the United States, United Kingdom and South Africa. The idea was that two or three firms would be selected for discussions about prospects in Windhoek, Namibia's capital, this summer, to get an early study under way. If it could be completed within a few months, it would be possible to make results available to those firms seeking to do more exploratory or appraisal work at Kudu field under exclusive licence.

As yet there is no sizeable market for gas in Namibia, and against Kudu field's easy exploitation is that it is well offshore and away from any urban centre. Namcor in its original call for companies with technical experience of gas transport and utilisation to come forward wanted an evaluation of economically justified markets for gas in Namibia and neighbouring states during the next 10–20 years. Another option considered in the past was the development of Kudu gas for South African use. A study by Johannesburg-based consultancy Ed Hern, Rudolph several years ago envisaged Kudu producing 500MMcfd-1 billion MMcfd of gas over 20 years which could be converted into liquid fuels, covering 30–65 percent of the republic's needs. A further option has been the piping of the gas overland to a location near Cape Town or to the terminal for Mossel Bay gas, now gearing up for liquid fuel conversion.

Forasol-operated semi-submersible rig *Asterie* which drilled in the Kudu gas field off Namibia.

Namibia is still in contention with South Africa about the area off Walvis Bay port, which is controlled by South Africa. The Windhoek government argues that Walvis Bay is a natural part of Namibia, and has said that it will turn the port into a free-trade area, handling goods in transit to other countries in southern Africa. Meanwhile, Namibia will avoid contentious acreage awards in this area. Namibia's southern border with South Africa along the Orange River has also to be determined. However, these acreage tiffs are unlikely to deter companies from seeking territory offshore Namibia.

Licence terms

Terms published by the government indicate that a reconnaissance licence will be granted for up to two years and may not be renewed more than twice. An exploration permit will not last longer than four years or be renewed more than twice. A production licence will be valid for up to 25 years and can be renewed once only, for up to 10 years. A royalty of 12.5 percent will be payable on production but the ministry may remit, defer or refund royalties at discretion. A petroleum income tax on taxable income from a licence will be levied at 42 percent, although deductions will be allowed for royalty and expenses. An additional profits tax may also be levied. The government requires that when an application is presented on behalf of more than one company, groups must not consist of more than five companies, participating interests must be indicated and a designated operator must be stated. As well as taking into account economic terms offered, technical competence and financial strength of the applicants, willingness to perform a complete evaluation of the petroleum potential of a licence will be required.

The emphasis in Namibia's offer documents is on swift notification of oil and non-associated gas finds, to ensure speedy development. Long-term flaring of gas may only take place with approval of the minister, in a bid to conserve the resource. If it is believed that gas found with oil is commercially exploitable, 'the company shall be obliged to include proposals for such exploitation in its development plan'. If the minister is not satisfied with the results of the company's appraisal, the viability of gas exploitation shall be referred for determination by a sole expert agreed by the parties 'and failing such agreement by the president of the British Institute of Petroleum.' This is one of several issues which the IP president will be called upon to settle if no other agreement can be made. ■

In the second half of last year, CGG ran a Vibroseis survey over the Etosha Basin in Namibia for Overseas Petroleum and Investment Corporation.

MAKING CLEANER FUELS IN EUROPE — THEIR NEED AND COST

16 October 1991

A one-day conference to be held at
The Cavendish Conference Centre, London

The subject of cleaner fuels is both topical and vital, in the light of today's growing realisation that we must preserve our environment both now and for future generations.

The following papers will be presented:

Chairman: Mr Alan Hodson, General Manager, Conoco Refinery, South Killinghome

Overview Paper — European targets for cleaner fuels specifications and lower emission levels
Peter Stief-Tauch, Head of Unit, Directorate General X1, Commission of the European Communities

Reformulated Gasoline in Europe — What should it be and what will it cost?
Steve McArragher, Fuels Technical Affairs, Shell International Petroleum Co. Ltd.

How to meet diesel fuel quality in the future European scene
Joachim Brandt, Senior Advisor EC Affairs, Mobil Europe

Growing problems with the quality of bunker fuels
Professor RV Thompson, Dean — Faculty of Engineering, University of Newcastle upon Tyne

Processing the bottom of the barrel for best environmental results
Stuart Simpson, Manager, Marketing Services, UOP Processes International Inc.

Cleaner fuels — The impact on European refining
Chris G Peacock, Principal, Chem Systems Ltd.

Open Forum
Comprising the Chairman and all Speakers

This is an important and timely conference, of major interest and value to all those engaged in the fuels business. It would be unwise to miss it.

For further information, and a copy of the registration form, please contact

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

IMPROVED MEMBERSHIP BENEFITS

We believe membership of the Institute is now better value than ever before. The new services make such an attractive package that many people will want to take advantage of membership if they are aware of the benefits.

Amongst the services members are now entitled to are:

- APPLY FOR INCLUSION IN THE INSTITUTE'S REGISTER OF CONSULTANTS
- SAVE UP TO £86 ON MEMBERSHIP OF THE ROYAL OVERSEAS LEAGUE WHICH ENTITLES IP MEMBERS TO ENJOY THE ELEGANT FACILITIES OF ITS CLUBHOUSES IN ST JAMES' AND EDINBURGH
- MOTOR AND HOUSEHOLD INSURANCE
- MEDICAL INSURANCE
- PROFESSIONAL INDEMNITY INSURANCE
- MEMBERSHIP OF THE INSTITUTE'S SPECIAL INTEREST GROUPS AND BRANCHES.

RECRUIT A MEMBER

You can help us make people more aware by recommending membership to colleagues or friends within the industry.

By joining before the end of September any new member will automatically have their membership extended to 15 months for the price of the normal annual subscription.

If you can persuade a new applicant to join before the end of October we will send you a gift of a leatherbound 1992 IP Diary as a token of our appreciation.

The updated 1992 diary, bound in burgundy leather with the IP crest in gold, is packed full of valuable information about the oil industry and makes an ideal seasonal gift.

The Institute's new application form included in this issue explains the benefits of membership in greater detail. **Why not pass the form to a friend or colleague and propose them for membership?**

New for members of the Institute of Petroleum — a package of insurance services

The Institute of Petroleum, in seeking to extend the range of benefits offered to its members and their families, has recently negotiated a specially arranged package of services with the Frizzell Group.

The scheme called 'Membership Benefits by Frizzell' has been set up to provide Motor and Home Insurance, Road Rescue and an extensive range of financial services and products to members. It is a service that will give busy professional people the convenience of 'one-stop' shopping for a wide selection of insurance cover at discount premiums.

The range of products and services now available is not only for individual members. The comprehensive package includes commercial property, fleet motor and professional indemnity insurances, designed to meet the diverse commercial needs of IP corporate members. The products and services available include:

- Motor insurance
- Pensions
- Life insurance
- Personal bank loans
- Medical insurance
- Household insurance
- Retirement advice
- Savings accounts
- Frizzell Road Rescue

Founded in 1923, the Frizzell Group is the United Kingdom's largest privately owned company specialising in arranging insurance, banking and financial services for members of institutes, societies, associations, unions and clubs.

Customer service

In assessing the merits of a large number of insurance companies and brokers and then verifying its findings with other institutions and associations, the Institute was able to confirm that in addition to providing insurance cover at competitive rates, another feature was Frizzell's reputation for customer service. 'We discovered that in evaluations conducted by major consumer groups over a number of years Frizzell scored consistently highly in the efficiency of its claims service' said Mr Brian Raggett, IP Director — Membership Services. 'Anyone who has had the misfortune of pursuing a claim will know how irksome and protracted this procedure can sometimes be. We believe a helpful and efficient claims service will be appreciated by our members', he added, 'as reflected in the 'Service Pledge' made to every customer'.

Motor and home cover

Motor Insurance. Members can now take advantage of the special terms and services negotiated with Frizzell for motor insurance policies that include extra benefits such as free assistance in the recovery of out-of-pocket expenses following an accident. The cost could be substantially less than might be paid elsewhere.

Automobile Breakdown Service Frizzell can provide motorists with around-the-clock repair and recovery services. A free-phone call anywhere in the UK brings help within the hour. Details will be sent with all motor insurance quotations.

Home Insurance is arranged by Frizzell for nearly 200,000 people who enjoy favourable premium rates and wide, flexible cover on buildings and contents.

Discounts

With the principal objective of providing its members with value for money services, the Institute will not be taking any commission on policies taken out by members. Instead, this goes directly to the membership in the form of an introductory bonus voucher worth £10 off a single policy (either motor or home) or £30 if members take out both car and home insurance. These special discounts have been negotiated by the Institute of Petroleum and the vouchers will be sent automatically with every Frizzell motor or home insurance quotation. These introductory benefits for members could make it worthwhile to enquire about transferring existing insurance to Frizzell. From time to time members may receive communication of additional services from Frizzell, sent directly from the Institute's mailing house. While some members may prefer not to receive such offers, we believe that the majority of members will welcome these additional benefits. The IP undertakes to exclude any member who specifically requests to be deleted from these mailings.

The new services are available immediately.

Independent financial advice is provided by Frizzell Life and Financial Planning Ltd, a member of FIMBRA.

Not all of the services mentioned here are regulated by the Financial Services Act and the rules made for the protection of investors by the Act would not apply to them.

Des Benjamin (left), Divisional Director at Frizzell Financial Services Ltd, with Brian Raggett, Director — Membership Services at the IP.

THE INSTITUTE OF PETROLEUM

Building on a History of Achievement

For more than 75 years, the Institute of Petroleum (IP) has been one of Europe's principal independent bodies concerned with the advancement of knowledge in the science, technology and economics of the oil and gas industry.
Its objectives are to ensure that its members are informed about the industry in which they work and are satisfied that the standards and codes which affect their commerce and operations are based on good industry practice and science. IP Committees and Panels – professionals from the oil and service industries, supported by its qualified Secretariat – pool their technical experience on international issues of concern such as health, safety and the environment, maintaining close liaison with common interest organisations in the UK, continental Europe and worldwide.
Additionally, through its comprehensive programme of conferences, courses and seminars, the IP seeks to foster and improve the professional knowledge, skills and standing of its members. In these matters the IP has earned an international reputation as a centre for information and as a respected forum for expert discussion and analysis on a wide spectrum of energy interests.

CAN I JOIN?

If you have an active professional interest in sharing and developing your knowledge of the oil, natural gas, or energy industries, then you are eligible to apply to join the Institute of Petroleum.

You may apply for membership wherever you are based in the world and whether you are employed within the petroleum industry or in any of the many industries or services associated with it.

The Institute has over 7,000 members and the number of successful new applicants grows each year. IP members are drawn from the whole spectrum of petroleum-related sectors, including:

- Exploration and Production
- Refining and Manufacturing
- Marketing
- Storage and Distribution
- Supply and Trading
- Fuels and Lubricants
- Petrochemicals
- Information Technology
- Accountancy and Financial Services
- Engineering
- Project Management
- Planning
- Economics
- Health, Safety and Environmental Affairs
- Education and Training
- Research and Development
- Consultancy

THE BENEFITS OF MEMBERSHIP

Information

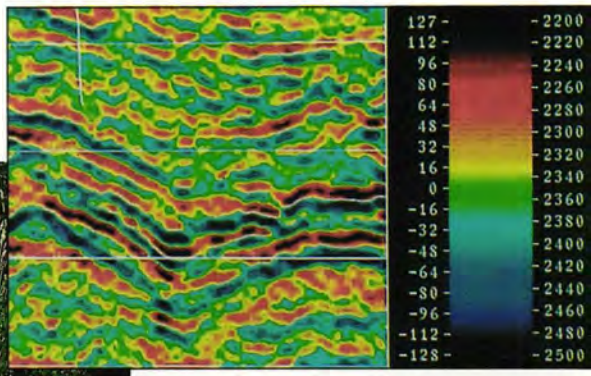
The increasing number of industry professionals seeking membership of the Institute do so because they recognise that fast and direct access to specialist advice or information when it is needed is now, more than ever, an essential requirement for staying ahead in business.

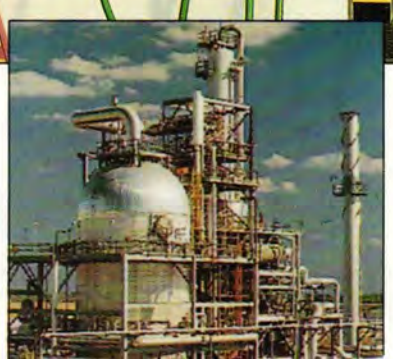
The Institute of Petroleum, as a centre of scientific, technical, economic and marketing data and expertise, has the resources to help you.

Its expert **Technical Department and Library and Information Service** answer around 15,000 enquiries each year, accessing an unrivalled range of information sources, including some 20,000 publications. The Service also accesses hundreds of external on-line databases in the USA and Europe, in addition to its own internal databases.

Petroleum Review, the Institute's respected international magazine, issued free to members, provides you with a regular and authoritative source of information to ensure that you are in a position to take advantage of important developments impacting the industry.

Attending **IP Conferences** enables you to take an in-depth look at areas of topical concern, to hear the views of prominent industry figures and to meet your opposite numbers across the industry.





The Institute's strength is derived from the diversity of skills and enthusiasm of its membership.

Pictures courtesy of BP, Enterprise Oil and Shell

PROFESSIONAL DEVELOPMENT

Upon election you can, as an individual member of the Institute, use the designation **"M.Inst.Pet."** after your name. Candidates of suitable standing may, after five years' membership, apply for **Fellowship** of the Institute, with the professional status that this prestigious award would confer.

In addition, you may take advantage of any of the Institute's **Professional and Career Development Courses**. The Institute recognises the diversity and importance of the technical and management skills represented in the petroleum industry and is currently developing additional courses designed to help its members to perform their jobs more effectively and to assist them in their future careers.

BUSINESS CONTACTS

Getting involved in the activities of the IP, centred on its elegant Central London headquarters, offers members the chance to establish valuable contacts throughout the industry.

The meetings of the Institute's **Special Interest Groups** – *Energy Economics, Exploration & Production, Environment, Personnel, Education and Training, Information for Energy* – provide a forum for lively discussion and debate. Recent meetings have given members the opportunity of meeting with government ministers, EC officials, MPs, leading economists, industry Chief Executives and other experts.

You may join, free of charge, any of the Institute's 16 active **Branches** in the UK, Ireland and overseas, which organise their own programmes of professional and social events with the aim of promoting members' interests in the region.

Attending the Institute's many **social functions**, special **Lunches** or **events** gives you the chance to meet the "Who's Who" of the oil industry and make new contacts, as well as keep up with old friends. Industry CEOs and OPEC Ministers have spoken at recent Institute Lunches and the famous **IP Annual Dinner**, the highlight of what has come to be known as "IP Week", is one of the most important social occasions on the international oil calendar.

AFFINITY BENEFITS

The Institute has negotiated, on behalf of its members, valuable personal benefits, which include preferential rates on:

- **Membership of the Royal Over-Seas League,** amounting to a **discount** of up to **£86.00** on the first year's membership. The Royal Over-Seas League has attractive Clubhouses in St James's, at the heart of London's Clubland, and in Edinburgh's Princes Street, as well as a network of reciprocal clubs around the world.
- **Motor and Household Insurance**
- **Medical Insurance**
- **Professional Indemnity Insurance**
- **Other Financial Services**

Conferences, Publications and Information are popular membership benefits.

SUMMARY OF BENEFITS

Membership of the Institute entitles you to:

- Use the designation "M.Inst.Pet." after your name and apply for Fellowship ("F.Inst.Pet.") after five years;
- Wear an Institute Members' or Fellows' tie or scarf;
- A free monthly copy of the Institute's magazine, Petroleum Review, and its valuable Annual Retail Marketing and other Surveys;
- Full use of all the IP's Technical, Library and Information Services, including access to computerised databases;
- Privileged access to and large discounts on the Institute's comprehensive conference programme and publications and its professional and career development courses;
- Membership of any of the Institute's Special Interest Groups or Branches;
- Apply for inclusion in the Institute's Register of Consultants;
- Attend and invite guests to the Institute's calendar of social events;
- A range of useful personal affinity benefits.

At only £36 (and only £10 if you are aged under 25), the cost of membership can easily be recouped by taking advantage of any of the discounts available to members and is tax deductible.

HOW DO I APPLY?

Simply complete the attached application form and send it, with your remittance, to:

Caroline Nutt
Membership Secretary
The Institute of Petroleum
61 New Cavendish Street
London W1M 8AR
Telephone: 071-636 1004

If you do not know an existing IP member to propose your application, we will consider a letter of reference from someone who knows you well and is in a senior position to yourself at your place of employment.

We will acknowledge your application on receipt and inform you of the outcome as soon as possible thereafter.

We consider Membership of the Institute to be excellent value. We hope that you will agree and that you will wish to take advantage of all that the Institute has to offer its members and apply today. We look forward to receiving your application.

Nearly 400 COMPANIES have taken advantage of the benefits of membership of the Institute. If you would like to learn more, please call Caroline Nutt, who will be happy to talk to you about the benefits to your company.

The Institute of Petroleum

A Company Limited by Guarantee — No. 135273 England
61 NEW CAVENDISH STREET, LONDON W1M 8AR
Tel: 071-636 1004 Telex: 264380G Fax: 071-255 1472

APPLICATION FOR ELECTION TO MEMBERSHIP

FOR OFFICIAL USE ONLY	Acknowledged:	Elected to Fellowship: Date
	Membership No.:	Resigned/Lapsed: Date
	Date of Joining:	Reinstated: Date Owing Grade

Surname				Job Title (if applicable)			
First Names				Employer's Name (if applicable)			
Mr. Mrs. Miss. Ms. Dr. etc.		Decorations		Business Address			
Date of Birth		Age	Yrs.			Postcode	
How were you introduced to the Institute?				Country		Tel:	
						Fax:	
				Home Address			
Have you previously been a member of the Institute? ☐ Yes ☐ No						Postcode	
If so, please state: Grade ..... Date Joined ☐☐☐☐☐☐ Date Lapsed ☐☐☐☐☐☐				Country		Tel:	
						Fax:	
Employment Status	☐ Employed ☐ Self-Employed ☐ Retired ☐ Student ☐ Other			Preferred mailing address ☐ Home ☐ Business Preferred invoice address ☐ Home ☐ Business			

ACADEMIC OR PROFESSIONAL QUALIFICATIONS & SUBJECTS (Higher First)

Qualification	College/University	Year	Subject

MEMBERSHIP OF PROFESSIONAL BODIES (e.g. Institution of Mechanical Engineers)

Professional Body	Grade of Membership	Chartered Status (e.g. C.Eng.)

TYPE OF ORGANISATION

Tick type of organisation by which you are currently, or were most recently, employed. Please tick one box only.

☐ 00	major international integrated oil co.	☐ 11	transport industry & retail services
☐ 01	other integrated oil co.	☐ 12	information technology/computing/publishing
☐ 02	independent oil co. upstream	☐ 13	traders/brokers
☐ 03	independent oil co. downstream	☐ 14	investment/finance/banking/legal
☐ 04	supply/distribution/storage	☐ 15	educational/training establishment
☐ 05	other energy industry (gas/coal etc.)	☐ 16	government/military/local authority
☐ 06	engineering contractors/manufacturers or suppliers of equipment	☐ 17	consultancy
☐ 07	shipping	☐ 18	industry association
☐ 08	E & P services	☐ 19	research establishment
☐ 09	inspection/laboratory service co.	☐ 20	geophysical/seismic company
☐ 10	chemical/additive co.	☐ 21	other (please specify) .....

JOB FUNCTION

Please tick the function(s) (2 maximum) which mostly describe(s) your current or most recent job.

- ☐ 00 director/general manager
- ☐ 01 planning/economics
- ☐ 02 finance/computer services/information technology
- ☐ 03 personnel/industrial relations/training
- ☐ 04 administration/legal/public affairs
- ☐ 05 product & process research & development
- ☐ 06 exploration & geophysical
- ☐ 07 E & P services
- ☐ 08 drilling & production
- ☐ 09 supply & trading
- ☐ 10 transport/pipelines/shipping
- ☐ 11 refining/manufacturing
- ☐ 12 marketing/sales/distribution
- ☐ 13 quality assurance/analysis/testing/measurement
- ☐ 14 engineering/project management/design/construction
- ☐ 15 medical/health & safety
- ☐ 16 environment
- ☐ 17 academic
- ☐ 18 other (please specify) .....

.....

INTERESTS

Please indicate, using the code numbers above, the subject areas which most interest you.

☐ ☐ ☐ ☐ Other (please specify) .....

What are the particular benefits you hope to derive from membership of the Institute? .....

.....

.....

PROPOSER

I, being an individual member (member no. ☐☐☐☐☐☐☐☐) or nominated representative of a Collective Member

(name of company: .....) and having known the candidate personally

for .....years, propose and recommend the candidate in accordance with the By-Laws as a fit and proper person to belong to the Institute.

Signature: .....

Name: ..... Date .....

APPLICANT

I, the undersigned, declare that the statements made herein are correct to the best of my knowledge and belief. I agree, if admitted to membership, to be governed by the rules and regulations of the Institute of Petroleum as they now exist and as they may hereinafter be altered. I agree that the information provided above, and other relevant personal details, may be held on computer at the Institute of Petroleum and its branches.

Signature of Applicant: ..... Date .....

PAYMENT

Applications must be accompanied by payment, as follows:

— Applicants of 25 years of age or more £36.00

— Applicants under 25 years of age £10.00

Payment by cheque — Please make your cheque payable to the Institute of Petroleum. If you cannot pay by UK sterling cheque, draft, or credit card, you should add £10.00 or US$20 to cover bank charges.

Payment by Credit Card — Please complete details below, using any one of:

☐ VISA ☐ MASTERCARD ☐ ACCESS ☐ EUROCARD (please tick as appropriate)

Expiry Date m/yr ..... Credit Card Holder's Name .....

Registered Address .....

Please charge to my/our card no ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ the sum of £ .....

Credit Card Holder's Signature .....

FORTHCOMING EVENTS

September

5th–6th
London: Ernst and Young/ ABN-AMRo Bank International Oil and Gas Tax Conference. Details: Jim Marshall, National Tax Partner, Oil and Gas, Ernst and Young, Becket House, 1 Lambeth Palace Road, London SE1 7EU. Tel: (071) 928 2000. Fax: (071) 928 1345.

9th–13th
London: Course on 'Accredited Safety Auditor'. Details: International Loss Control Institute, PO Box 1898, 4546 Atlanta Highway, Loganville, Georgia 30249, USA. Tel: (404) 466 2208. Fax: (404) 466 4318.

10th–12th
Quebec City, Canada: Conference on 'Trans-shipment' including oil and chemical shipment. Details: The Mariport Group, Suite 215, 3425 Harvester Road, Burlington, Ontario, Canada L7N 3N1. Tel: 416 333 8171. Fax: 416 333 1162.

12th
London: Conference on 'Technology transfer and the global environment: motives and mechanisms'. Details: The Environment Conference, The Conference Unit, The Royal Institute of International Affairs, 10 St James's Square, London SW1Y 4LE. Tel: (071) 957 5700. Fax: (071) 957 5710.

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.

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.

19th–20th
London: Course on 'North Sea Risk Analysis'. Details: DCA Consultants Ltd, Rosewall Cottage, Main Road, Aberuthven, Perthshire PH3 1HB. Tel: (0764) 63936.

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
London: Conference on 'After the Conflict: A New Era for the Oil Industry'. Details: Karen-Anne Holliday, Conference Organisation, Centre for Global Energy Studies, 17 Knightsbridge, London SW1X 7LY. Tel: (071) 235 4334. Fax: (071) 235 4338.

24th–26th
London: Course on 'Advanced Offshore Engineering'. Details: BPP Technical Training, 2 Tavistock Place, London WC1H 2RA. Tel: (071) 837 6362. Fax: (071) 837 0822.

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.

INTERNATIONAL SYMPOSIUM ON THE HEALTH EFFECTS OF GASOLINE

November 5–8

Miami, Florida, U.S.A.

The symposium will address human health effects including results of epidemiology and animal studies, mechanistic studies, and risk characterisation with reference to exposure to unburned motor gasoline. Also considered will be health effects of methyl tertiary butyl ether, ethyl tertiary butyl ether, methanol, ethanol, benzene, and butadiene as these substances may present a human exposure potential from unburned gasoline or exhaust emisions.

Registration cost prior to 7 Oct: $500 industry, $175 government/student

after 7 Oct: $600 industry, $200 government/student

Information from: Madeleine D Sellouk, API/HESD, 1220 LSt., NW, Washington DC 20005, USA.

The Institute of Petroleum is a co-sponsor of this symposium which will include the presentation of a paper 'The UK Oil Refinery and Distribution Centre Studies: A 38 year Follow-Up by Dr L. Rushton'. This work is part of the Institute of Petroleum Research Programme.

26th
London: Conference on 'UK and European Gas Markets'. Details: Public Issues Conferences, Gayfere House, 22/23 Gayfere Street, London SW1P 3HP. Tel: (071) 799 2263. Fax: (071) 799 2262.

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

26th–27th
Brussels: International Congress on 'Lubricants for the Future and the Environment'. Details: Mr Thibou, Congress Department, BFB Consultant, 23 Rue Haigneaux, 5300 Nameche, Belgium. Tel: 32 (0)81581177. Fax: 32 (0) 81581179.

29th-2nd October
London: Conference and exhibition on 'The Way Ahead—Hydrocarbons for the 1990s'. Details: AAPG International Conference, PO Box 979, Tulsa, OK 74101–0979, USA.

30th–1st October
London: '1991 European Seminar on the Refurbishment of Bulk Liquid Storage Tanks'. Details: Stephanie Hodder, Institute for International Research, 11th floor, Alembic House, 93 Albert Embankment, London SE1 7TY. Tel: (071) 587 1117. Fax: (071) 587 3703.

30th–1st October
London: Conference on 'The Offshore Industry and the Environment'. Details: IBC Technical Services Ltd, Bath House, 56 Holborn Viaduct, London EC1A 2EX. Tel: (071) 236 4080. Fax: (071) 489 0849.

FORTHCOMING EVENTS

October

1st–2nd
Oslo, Norway: 'Petroleum Tax Conference—Oil and Gas Tax Reform 1992'. Details: Norwegian Petroleum Society (NPF), PO Box 95, N–5049 Sandsli, Norway. Tel: 47 5 22 48 85. Fax: 47 5 22 89 70.

1st–4th
London: Workshop on 'Petroleum Investment in Eastern Europe and the Soviet Union'. Details: Centre for Petroleum & Mineral Law Studies. Tel: (0382) 23182 ext 4299. Fax: (0382) 22578.

2nd
London: Seminar on 'COSHH—Making it work'. Details: SCI Conference Secretariat, 15 Belgrave Square, London SW1X 8PS. Tel: (071) 823 1698. Fax: (071) 823 1698.

3rd
London: Seminar on 'Coriolis Mass Flowmetering—Recent Developments and Industrial Applications'. Details: Sira Communications Ltd, South Hill, Chislehurst, Kent BR7 5EH. Tel: (081) 467 2636. Fax: (081) 467 7258.

3rd
Birmingham: 'Petrol Pump Ball.' Details: Ben—Motor and Allied Trades Benevolent Fund, Lynwood, Sunninghill, Ascot, Berkshire SL5 0AJ. Tel: (0344) 20191. Fax: (0344) 22042.

6th–9th
Dallas, USA: Society of Petroleum Engineers Annual Technical Conference and Exhibition. Details: SPE, 222 Palisades Creek Drive, Richardson, TX 75080, USA. Tel: 214 669 3377, Fax: 214 669 0135.

7th–10th
Warwick: 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.

9th
London: Conference on 'Automotive Combustion — Environmental and Health Implications'. Details: Caroline Little, The Institute of Petroleum.

9th
London: Conference on 'Energy from Waste—clean, green and profitable'. Details: Conferences Department, The Institute of Energy, 18 Devonshire Street, London W1N 2AU. Tel: (071) 580 0008. Fax: (071) 580 4420.

13th–18th
Moreton in Marsh: Course on 'Handling of Emergencies in the Petroleum Industry'. Details: Courses Office, The Fire Service College, Moreton in Marsh, Gloucestershire, GL56 0RH. Tel: (0608) 50831. Fax: (0608) 51788.

15th
London: Conference on 'Partnering: Contracting without Conflict'. Details: Gina Booth, National Economic Development Office, Millbank Tower, Millbank, London SW1P 4QX. Tel: (071) 217 4108. Fax: (071) 976 5736.

16th
London: Conference on 'Making Cleaner Fuels in Europe—Their Need and Cost'. Details: Caroline Little, The Institute of Petroleum.

16th
London: Course on 'Drilling for Engineers'. Details: Society for Underwater Technology, 6 Middleton Circle, Bridge of Don, Aberdeen AB22 8NZ. Tel: (0224) 823637. Fax: (0224) 820236.

17th
London: Seminar on 'International Offshore Mooring'. Details: Ramnas Ltd, Baltic Chambers, Suite 240, 50 Wellington Street, Glasgow G2 6HJ. Tel: (041) 2214665. Fax: (041) 2042107.

17th
London: Conference on 'The Future of Nuclear Power'. Details: Alison Riley, OXERA, Blue Boar Court, Alfred Street, Oxford OX1 4EH. Tel: (0865) 251142. Fax: (0865) 251172.

18th
London: Workshop on 'Auditing Environmental Air Pollution'. Details: Profex, Buckingham House, The Broadway, Stanmore, Middlesex, HA7 4BR. Tel: (081) 954 9546. Fax: (081) 954 5772.

20th–25th
Moreton in Marsh: Course on 'Handling of Emergencies in the Petroleum Industry'. Details: Courses Office, The Fire Service College, Moreton in Marsh, Gloucestershire, GL56 0RH. Tel: (0608) 50831. Fax: (0608) 51788.

20th–25th
Buenos Aires, Argentina: 'The 13th World Petroleum Congress'. Details: Mrs Pauline Ashby, The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR. Tel: (071) 636 1004. Fax: (071) 255 1472.

22nd
London: Conference on 'Remediation of Industrial Sites'. Details: Caroline Little, The Institute of Petroleum.

23rd
London: Seminar on 'Oil Pollution—Claims, Liability and Environmental Concerns'. Details: Linda McKay, Legal Studies and Services Ltd, 3rd Floor, Bath House, 56 Holborn Viaduct, London EC1A 2EX. Tel: (071) 236 4080. Fax: (071) 489 0849.

24th
London: 'Towards a Training Framework for the 1990s'. Details: Alan Lodge, The Institute of Petroleum.

24th
London: Seminar on 'Managing your Corporate Environmental Image'. Details: Profex, Buckingham House, The Broadway, Stanmore, Middlesex, HA7 4BR. Tel: (081) 954 9546. Fax: (081) 954 5772.

30th–31st
London: 'The Fourth Oil Loss Control Conference'. Details: Caroline Little, The Institute of Petroleum.

European unleaded petrol market grows

By Dr Ian Berwick OBE

In 1990 unleaded petrol accounted for 36 percent of all petrol sales in Western Europe. This compares with 10, 15 and 25 percent in the three previous years.

Table 1 shows unleaded penetration in the European Community countries in 1990, together with the European EFTA countries. The disparities between countries widened during the year, with the former West Germany at 76 percent unleaded and several countries still with tiny unleaded market shares.

The former East Germany has made astonishing progress, coming from virtually no unleaded sales in 1989 to a 35 percent penetration. Finland also achieved a spectacular transition from 16 to 48 percent. In the United Kingdom the market for unleaded increased from 19 to 34 percent.

Percentage penetration figures can give an incomplete picture. **Table 2** summarises the unleaded consumption over the past three years and gives a better view of the achievements of the refineries and distributors across Europe in the transition to unleaded.

Three different grades of unleaded are being marketed in Europe. The main grade, which must be offered by all EC member states is Premium (95 RON minimum). Super grade (97/98 RON) is available in most countries with well-developed unleaded markets. In France Super is the major unleaded grade. The third, Regular grade (91/92 RON) is widely available only in Germany and Austria. **Table 3** shows the grade distribution for 1990.

The changeover to unleaded continues. In the former West Germany unleaded accounted for over 80 percent of all petrol sold at mid-1991 and in June 1991 the United Kingdom reached 41 percent which is close to the European average for the first half of 1991. ■

	Total petrol consumption	*Total unleaded petrol consumption*	*Unleaded market penetration*
EC	*million tonnes*	*million tonnes*	*Percent*
Germany West	26.50	20.16	76
East	3.90	1.35	35
United Kingdom	24.32	8.26	34
France	17.99	2.52	14
Italy	13.63	0.66	5
Spain	8.14	0.06	0.7
Netherlands	3.44	1.68	49
Belgium	2.68	0.72	27
Greece	2.44	0.07	3
Denmark	1.56	0.91	58
Portugal	1.37	0.01	0.7
Eire	0·89	0.18	20
Luxembourg	0.41	0.13	32
EC totals	107.27	36.71	34.2
EFTA			
Sweden	4.15	2.21	53
Switzerland	3.69	1.88	51
Austria	2.53	1.31	52
Finland	1.96	0.95	48
Norway	1.78	0.64	36
EFTA totals	14.11	6.99	49.5
Totals for 18 countries	121.38	43.70	36.0

Table 1: Unleaded petrol uptake in 1990 in Europe

	1988	*1989*	*1990*
	million tonnes	*million tonnes*	*million tonnes*
Germany*	11.57	15.20	21.51 (49%)
United Kingdom	0.26	4.65	8.26 (19%)
Rest of EC	1.55	3.18	6.94 (16%)
EFTA	3.80	5.36	6.99 (16%)
Totals	17.18	28.39	43.70 (100%)

Note: *1988 and 1989 W Germany only, 1990 Unified Germany.

Table 2: Unleaded consumption in Europe 1988–90

Percentages of total petrol consumption	*Super+ grade*	*Premium grade*	*Regular* grade*	*Total unleaded*
EC	5.3	18.9	10.0	34.2
EFTA	1.7	43.1	4.7	49.5
18 countries	4.9	21.7	9.4	35.0

Note: + Available except in Greece, Italy, Portugal, Spain and Switzerland.
*Widely available only in Germany and Austria.

Table 3: Unleaded grade distribution in Europe in 1990

THE POWER AND EFFICIENCY OF MARINE PROPULSION

26 September 1991

A one-day conference to be held at The Institute of Petroleum, London

Today's marine propulsion machinery utilises the most advanced diesel engines in the world running reliably on the lowest cost residual fuels and successfully lubricated under the most severe operating conditions.

This conference, organised by The Institute of Petroleum and Lloyd's Register, brings together experts in the fields of fuels and lubricants from major oil companies, leading diesel engine builders, together with a shipowner, a fuels analyst and a representative of Lloyd's Register who will describe the R & D currently being undertaken on marine environmental exhaust emissions.

The conference is being co-sponsored by The Institute of Marine Engineers.

Papers will be presented on the following topics:

Consideration of issues potentially influencing marine residual fuel oil users, suppliers and engine builders

New reliable lubricants designed by mathematics and computers

Sulzer slow speed 2-stroke engines

Development of medium speed diesel engines to meet the needs of the 1990's

Quality of marine fuels — assessment and significance

Marine exhaust emissions from medium and slow speed diesel engines

Seafox — low cost primary control of emissions — a ship owner's experience

For a copy of the registration form, please contact

Caroline Little, The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR.

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

WARREN SPRING LABORATORY

CONTROL OF OIL POLLUTION COURSE

To be held at Warren Spring Laboratory, Stevenage, UK

20–25 OCTOBER 1991

This course will provide a sound background knowledge of the factors involved in the effective planning and management of clean-up operations following an oil spill at sea or on the shoreline. It is aimed at those with management responsibilities for counter pollution measures either nationally, regionally or in the oil industry. Topics will include: **contingency planning; behaviour of oil at sea; anti-pollution legislation; oil recovery; compensation and liability; use of dispersants; prediction, detection and modelling; shoreline clean-up and a simulated oil spill exercise.**

The course fee will be £825.00 plus 17.5 percent VAT per person, excluding accommodation.

For further details and 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.

The lubricant market in Eastern Europe

By James Mills and Manuel Poupon, Enerfinance Consulting Services

The thumping machinery and clanking vehicles of Eastern Europe require vast quantities of oils and greases to keep wheels turning but the reorganisation of the economies of the region has produced contradictory trends in the market for automotive and industrial lubricants.

A recently published study by Enerfinance Consulting Services, a Paris-based firm, examines the changing market for lubricants in six East European countries and forecasts the types and volumes of lubricants that will be required in the region over the next two decades.

The markets of Bulgaria, Czechoslovakia, Hungary, Poland, Romania and Yugoslavia are hardly uniform, differing as much from each other as they do from those in Western Europe in terms of size, structure and outlook. In general, lubricant consumption per capita in Eastern Europe is now slightly lower than in Western Europe. Industrial lubricants and greases make up a larger proportion of total consumption than do motor oils and the future of demand hinges more on quality than on quantity.

Consumption

The six markets together accounted for more than a fifth of all the lubricants consumed in Europe outside the Soviet Union in 1990, 1.66 million tonnes of a total market of nearly 8.4 million tonnes. The East European market has declined steadily from a peak of 1.85 million tonnes in 1986. Per capita consumption in the region was lower than in Western Europe for the first time in 1990, having reached 13.8kg per inhabitant in 1990, slightly lower than the 14.2kg per capita consumed in all of Western Europe (14.5kg per capita in countries of the European Community). Outdated industrial equipment and a much-repaired vehicle fleet have greater need of lubrication than do the newer and more advanced machines and engines commonly in Western Europe but industrial production in Eastern Europe has recently taken a sharp fall and there are still far fewer vehicles on the road.

Poland is the largest market of the six countries, with lubricant consumption of just under 500,000 tonnes in 1990 but Poland ranks only third in per capita consumption. At 12.8kg per person, per capita consumption in Poland is well below that in heavily industrialised Czechoslovakia, the second largest market in the region, where 15.6 million inhabitants each consumed an average of 21.5kg of lubricants in 1990.

Czechoslovakia stands out from the other East European markets by reason of its intensive use of lubricants and takes a prominent place in pan-European statistics. Although the total market in Czechoslovakia is smaller than in Germany, France, the United Kingdom, Italy or Spain, the largest markets in Western Europe. Czechoslovakian consumption per capita is greater than in any of them, surpassed only by the smaller markets of Belgium, Norway and Austria.

It should be noted that the use of lubricants in the former East Germany is even more intense than in Czechoslovakia, at 27.4kg per capita in 1990. Prior to German unification, West Germany was already Europe's largest market and East Germans consumed more lubricants proportionately than any other Europeans. The single German market is now Europe's largest by far but average consumption per person ranked below Czechoslovakia in 1990 statistics.

The market for lubricants in the rest of Eastern Europe in 1990 ranged from 296,000 tonnes in Romania to 105,000 tonnes in Bulgaria. Per capita consumption in the other countries was less than the average for all of Europe, at 13.8kg per person in Hungary, 12.8 in Romania, 12.1 in Yugoslavia and 11.7 in Bulgaria.

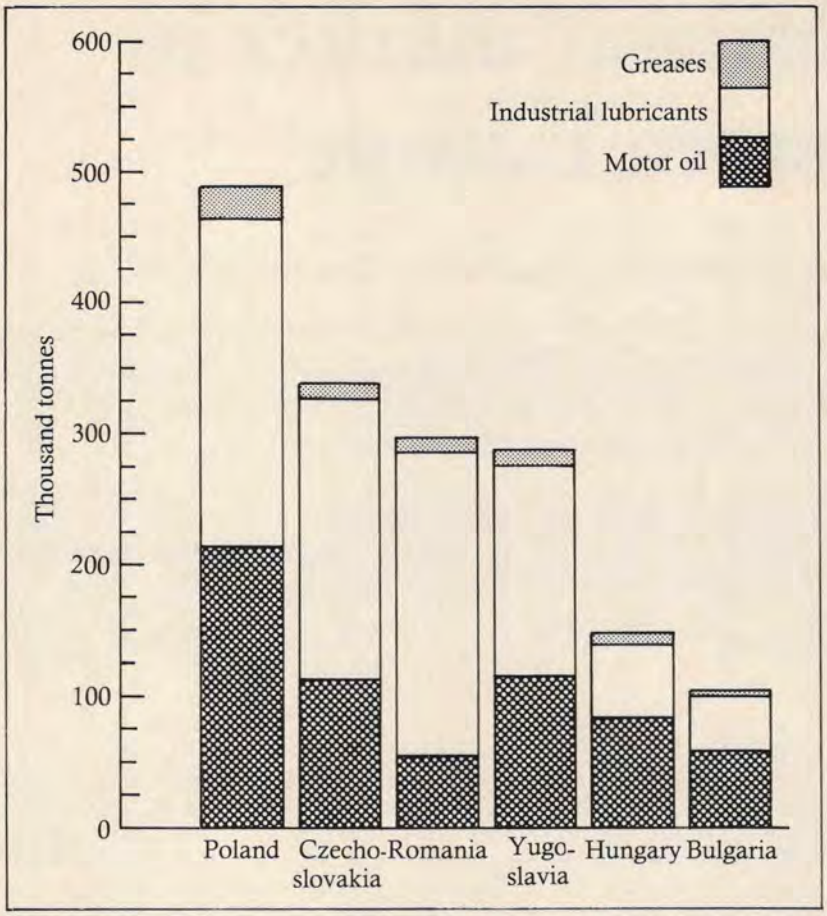
Structure

The market is more evenly divided between motor oils and other lubricants in Western Europe than it is on average in the former Eastern Bloc but the structure of lubricant consumption shows remarkable diversity from country to country, particularly in Eastern Europe.

Motor oils, a category which includes oil for gasoline and diesel motors as well as two-stroke engines, represent just over 48 percent of lubricant consumption in Western Europe. Other lubricants, here identified as 'industrial' lubricants even though some of them have automotive applications (automotive gear oil and shock absorber oil, for example), represent just less than 49 percent of consumption, the remaining 3 percent accounted for by greases of various descriptions.

Averages for Eastern Europe show that motor oils make up just 38.6 percent of the total market, industrial lubricants 57.5 percent and greases the remaining 3.8 percent but the Yugoslavian market is the only one of the six that breaks down roughly in line with the regional averages.

The Hungarian and Bulgarian



The lubricant market in Eastern Europe in 1990

markets are weighted in favour of motor oils, which represent 55.4 percent of the market in Hungary and 56.9 percent in Bulgaria. The number of vehicles per 100 inhabitants is higher than the regional average of 13.5 in both Hungary (19.6) and Bulgaria (14.3). Industrial lubricants represent roughly 40 percent of each of the two markets.

The structure of the Polish market more closely resembles the Western European average. Motor oils account for 44.1 percent of the market and industrial lubricants for 51.9 percent.

Industrial lubricants predominate in both the Czechoslovakian and Romanian markets but for very different reasons. Czechoslovakians are more likely than any other East Europeans to own a motor vehicle, with 20.8 vehicles per 100 inhabitants but industry is more highly developed there, as well. Industrial lubricants represent 63.1 percent of total consumption, compared with 33.1 percent for motor oils. In Romania, the respective figures are 77.2 percent and 19.2 percent, more a reflection of the tiny Romanian vehicle fleet than the state of the country's industry. There is only one vehicle per 15 inhabitants (6.5 per 100) in Romania, which partly explains the weakness of motor oils in the overall market for lubricants.

Quality

Many of the lubricants currently sold in Eastern Europe are considered obsolete by West European standards. Cars, in general, are old and do not require the highly specialised lubricants demanded by West European vehicle manufacturers. In the absence of demand for better qualities, refining and blending technology is much less sophisticated in Eastern Europe than it is in Western Europe. Motor oil quality is higher in Yugoslavia and Hungary, partly because all additives are imported from the West.

Domestic production of lubricants in Eastern Europe is organised differently than it is in Western Europe. There are only five plants in all of Eastern Europe where additives can be produced and their total output represents just 20 percent of requirements. The difference is made up by importing the finished additives produced by foreign companies or semi-finished additives that are mixed locally under foreign licence. Base oils are produced at a relatively large number of centres but capacity is generally small. On the other hand, there are relatively few blending centres, most of them connected to base-oil centres and operated by state-owned companies.

Although there is considerable trade in finished lubricants, the six countries produce sufficient quantities to satisfy domestic demand. Figures for 1989 show the region exported a volume of lubricants equal to its imports — 142,000 tons. Country by country, only Yugoslavia, Poland and, to a lesser extent, Czechoslovakia were net importers of lubricants. Surprisingly, at least one West European country maintains a centre in Eastern Europe for the manufacture of lubricants destined for the West European market.

Liberalisation of trade in 1990 may have upset the trade balance by making better-quality lubricants available. While the market itself is likely to continue shrinking up to 1995 as industrial production contracts further, imports can be expected to grow at the expense of domestic production. Better-quality lubricants themselves are likely to reduce the overall volume of lubricants required. An upturn in industrial production and expansion of the car fleet after 1995 are expected to stimulate demand and real growth can be expected into the next century.

Future outlook

Forecasts by Enerfinance Consulting Services take quality improvements as the most important factor in shaping demand in the short term. The total market in the six countries is expected to decline from 1.66 million tonnes to 1.51 million tonnes by 1995, a steep decline in the market for industrial lubricants partly offset by a small increase in motor oil consumption. After 1995, those trends are expected to reverse themselves, with growth in the industrial lubricant market pushing total consumption to 1.59 million tonnes by 2000 and 1.70 million tonnes by 2010.

Opportunities for West European lubricant manufacturers to provide better-quality lubricants exist in the markets of Eastern Europe, either by exporting finished products or by involving themselves in the reorganisation of local production. A relatively small investment in lubricant manufacturing or marketing might provide the opening through which West European oil companies might choose to launch more ambitious downstream operations. ■

THE INSTITUTE OF PETROLEUM

A TRAINING FRAMEWORK FOR THE 90s — THE CHALLENGE OF INTEGRATION

Thursday, 24 October 1991

A one-day conference organised by the Education and Training Committee

The following papers will be presented

The Concept of a Coherent Training Framework
Ian Williamson, Director, The College of Petroleum Studies

Using the NVQ Ladder to Grow People
John Gregg, Development Supervisor, Esso Petroleum Co Ltd.

Management Charter Initiative — How far have we got?
Speaker from MCI

Continuing Professional Development
Chris Senior, Senior Executive — CPD, The Engineering Council

The GEC Professional Development Consortium — A working liaison between industry and higher education
Paul Watts, Director, GEC Management College

Integrating Distance Learning into Inter-Company Training
Mike Hawse, Manager, Distance Learning Unit, British Gas plc.

The Training Framework and Corporate Strategy — The challenge of integration
Carla Watts, Training Manager, BP Exploration Operating Co Ltd.

For further information and a copy of the registration form please contact **Alan Lodge,** *Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR. Tel: 071 636 1004.*

IS THERE A FUTURE FOR THE INDEPENDENTS IN THE UK NORTH SEA?

Thursday 21 November 1991

To be held at

The Cavendish Conference Centre, London

Even though the North Sea is now considered to be one of the world's more mature oil provinces, the recent 12th licensing round aroused a great deal of interest from companies still prepared to face the challenges offshore.

Among these companies the independents successfully accounted for 25 percent of the new acreage granted, showing that they were confident they could overcome the special risks that accompany exploration on the United Kingdom Continental Shelf.

This conference, organised jointly by the Institute of Petroleum and County NatWest Wood Mackenzie (CNWM), brings together a group of acknowledged experts and analysts to look at the role of independents in the North Sea and the future risks involved.

Aside from a comprehensive overview on the independent sector by CNWM, the conference's topics will cover every aspect of the business from starting up an independent company to breaking into the international market.

For futher information, and a copy of registration form which will be available shortly, 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.**

Eastern Europe: patterns of petroleum storage and distribution

By Edward J Osterwald, Senior Consultant, Chem Systems Limited

The dramatic collapse of Communism in Europe at the end of 1989 sparked a sudden political and social openness with Western countries. The change also produced unprecedented business opportunities in the oil industry but the speed of investment has been hampered by a lack of basic knowledge about the petroleum sector.

This article will summarise the bulk storage situation in the major countries of Eastern Europe. As will be evident, there are significant capacity differences between the opposite sides of the former 'Iron Curtain'. In large part, this is a reflection of divergent industry structures between Eastern and Western Europe.

At best, many features of the oil industry in Eastern Europe compare favourably with counterparts in Western Europe and at worst defy explanation and logic. It is only when viewed within the context of the region's political and economic history that industry structure becomes comprehensible. [Ed note: This article was written before the August events in Russia.]

There are surprising similarities between the former Communist countries:

- Overwhelming reliance on the Soviet Union for crude oil supplies via the Friendship pipeline. The system was created by the USSR during the 1950s and 1960s to ensure that the Warsaw Pact satellites remained both politically and economically dependent.
- A series of functionally organised state monopolies that conducted exploration and production, foreign trade, refinery processing and pipeline services, as well as petroleum product distribution.
- Product supply infrastructure oriented toward constant, unchanging levels of throughput. As a result, the quantity of bulk storage in Eastern Europe is low by western standards.
- Since crude and product storage capacity were limited, contingency reserves and the capability to handle a wide diversity of product types were neither feasible nor necessary.

Crude supply

The main elements of the Friendship Pipeline are shown in **Figure 1.** The Northern Branch feeds refineries in Poland and the former GDR. The Southern system brings supplies to Hungary and Czechoslovakia. **Figure 1** also includes the 'Adria' pipeline, which connects the friendship network to the Adriatic coast at Omisalj in Yugoslavia.

Although there are other crude oil pipelines in Eastern Europe, the Soviet

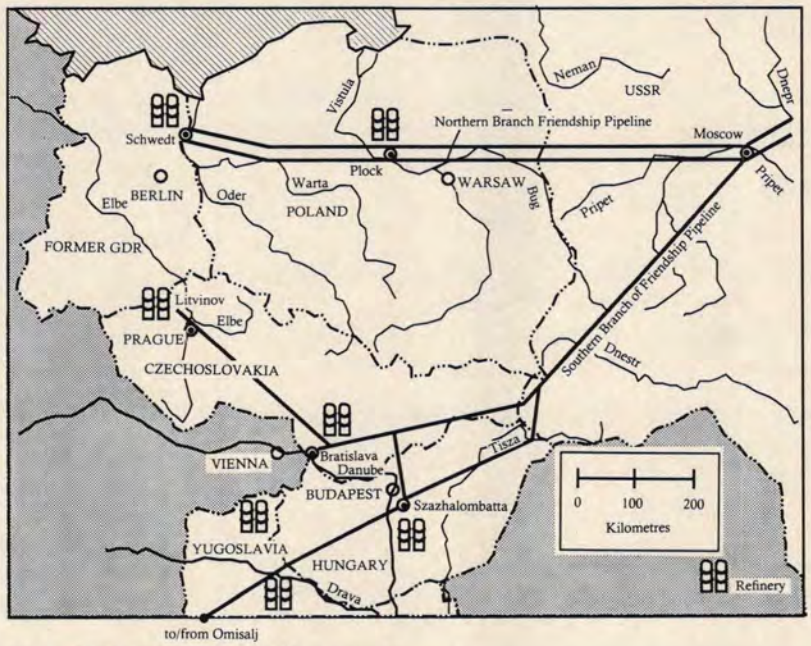


Figure 1: The Friendship pipeline network

Figure 2: 1990 crude supply to Eastern Europe (million metric tons)

Union is of critical importance in providing feedstock to the northern countries.

The region's dependency on oil imports from the Soviet Union may be more clearly understood when actual volumes are examined. **Figure 2** provides a graphical illustration of the crude supply balance in Eastern Europe during 1990. In total, 51 million tons were provided by the Soviets through the Friendship system. The proportion of Soviet oil for each country is presented in **Table 1.**

Industry structure

The economies of the COMECON countries were run through a cumbersome process of central planning. In keeping with this pattern, the petroleum industry was operated through a series of state-owned monopolies. Generally, there was a separate organisation for each of the following functional responsibilities:

- Exploration and production.
- Refining operations.
- Pipeline operations (normally both crude and product).
- Production distribution and marketing.
- Foreign trade in petroleum.
- Foreign trade in chemicals.

The only exceptions to the above pattern were in Yugoslavia and Czechoslovakia, where a similar approach was used but on a republic-specific basis.

It is also interesting to note that privatisation in these countries consists of the introduction of competition, together with sale of the former monopoly companies.

The command industry structure is, to say the least, unusual by Western standards. More importantly, however, when combined with overwhelming reliance on crude oil from a single source (ie the Soviet Union), petroleum sector operations focused almost exclusively on throughput.

As a result, bulk storage capacity for crude and product is less than is normal in Western countries. This reflects the fact that the oil industries were very centralised. Since they were oriented toward maintaining a 'centrally planned' level of throughput, there was less perceived need for contingency reserves than is common in Western countries.

Storage patterns

Chem Systems recently published a major multiclient study on 'The East European Oil Industry Infrastructure'. In order to conduct this project, a detailed analysis of the downstream oil industry was necessary. During this work we found that although most of the necessary information was readily obtainable through field interviews with knowledgeable individuals, many officals were at the same time very reluctant to discuss details of product supply and storage.

The previous regimes cloaked their petroleum industries in secrecy. Product supply infrastructure was particularly sensitive because of its military importance. These factors perhaps explain why product infrastructure data was at times difficult to acquire.

Nevertheless, general trends on bulk storage are discernible. **Table 2** presents a compilation of crude storage capacities. Similar information for products is shown in **Table 3.**

Much of the data in both tables is approximated. These cases are clearly noted. It should be apparent that Czechoslovakia, Yugoslavia and Bulgaria are the most uncertain.

Country	USSR	Other	Indigenous Production	Total
The Former GDR	100	—	—	100
Czechoslovakia	100	—	—	100
Poland	85	15	—	100
Bulgaria	75	25	—	100
Hungary	50	25	25	100
Romania	16	48	36	100
Yugoslavia	12*	63	25	100
Total	55	29	16	100

*Volumes not shown on **Figure 2**

Table 1: Summary of the proportion of crude oil provided by the Soviet Union to key countries in Eastern Europe during 1990 (percent)

	Poland	Czecho-slovakia	Former GDR	Hungary	Yugo-slavia	Bulgaria	Romania	Total
				millon metric tonnes				
Refineries	0.5	?	0.5	?	?	0.3	1.0	?
Other	1.2	?	0.2	?	?	—	0.8	?
Total	1.7	>0.5 (?)	0.7	>0.6 (?)	?	0.3	1.8	⩾5.6?
Crude Oil Processed in 1990:	13	13	13	8	16	8	25	96
Storage Capacity in terms of Days of Consumption:	48	>14 (?)	20	>27 (?)	?	14	26	⩾25?
Primary Transport	P/L*	P/L	P/L	P/L	Mainly P/L	Barge & Rail	P/L	

* — pipeline.

Table 2: Crude Oil Storage in Eastern Europe

Wherever possible, crude oil storage facilities are divided between refineries, bulk and 'other' locations. Poland has by far the largest capacity, primarily because the Northern Branch of the Friendship pipeline is much larger than the Southern extension to Czechoslovakia and Hungary. Romania possesses significant non-refinery crude storage because the country is the most prolific crude oil producer in Eastern Europe (excluding the Soviet Union).

It is also interesting to note that the amount of refinery crude storage is surprisingly consistent between countries, given the uncertainty in much of the data.

Table 2 also presents the volume of crude processed in each country in 1990. This allows an estimate of the storage capacity in terms of days of consumption. The lowest amounts correspond to those countries where the data is most uncertain. It is likely that on average, most East European countries can store sufficient crude to cover no more than 20 to 30 days of refinery processing. Over 100 days is typical in OECD countries.

Crude oil transport is mainly by pipeline. The only exception is in Bulgaria, which uses a combination of barge and rail for its single inland refinery.

Data on product storage and distribution was often difficult to acquire, particularly in Czechoslovakia, Yugoslavia, Bulgaria and Romania. Nationalist sentiments within the various Czech and Yugoslav republics are the strongest of any of the recently democratised nations of the region. As mentioned earlier, the oil industries in these two countries are organised on a republic basis. This may explain some of the reticence on the part of republic marketing monopolies to provide product supply information.

An interesting conclusion that may be drawn from the data in **Table 3** is that the quantity of bulk product storage is roughly the same as for crude. In part, this may reflect the fact that throughput was intended to be constant in the COMECON oil system, hence storage capacities for crude and product would tend to be the same.

Bulk storage in Eastern Europe also tends to be inflexible, in the sense that a wide variety of product types cannot be handled.

With the exception of Poland, there is sufficient product ullage in most East European countries to cover 20 to 30 days consumption.

	Poland	Czecho-slovakia	Former GDR	Hungary	Yugo-slavia	Bulgaria	Romania
				millon metric tonnes			
Refineries	0.5	?	?	?	?	?	1.0
Bulk	0.4	?	1.1	0.6	>0.4?	?	0.5
Pipelines/Other	5.6	?	?	?	?	?	?
Total	6.5	?	1.1	0.6	⩾0.4?	?	1.5
1990 Product Demand:	13	13	14	7	12	8	12
Storage Capacity in terms of Days of Consumption:	45	?	28	31	12?	?	45
Primary Transport:	Rail	Rail & P/L	Rail	P/L	Road, Rail & Barge	Road & rail	Rail & P/L

Table 3: Product Bulk Storage in Eastern Europe

The amount of storage in Poland is unusually large because product is imported in sizeable quantities from the Soviet Union by rail. Since the Soviets use a different rail gauge, product must be transhipped to different wagons at the border. Poland has several large terminals along its eastern border for this purpose.

In contrast to crude oil, a wide variety of mechanisms are utilised to ship petroleum products in Eastern Europe. There are well-developed pipeline networks in Hungary and Slovakia (eastern Czechoslovakia). The locations of pipelines throughout Czechoslovakia, however, remain shrouded in state security. Poland and the former GDR rely almost entirely for rail transport of products. The other countries use combinations of rail, road or pipeline.

The future

The single most critical issue facing the northern countries (the former GDR, Poland, Czechoslovakia and Hungary) is the need to improve crude supply flexibility. It is imperative that these countries develop alternative crude import infrastructure. It is for this reason, for example, that the Czech government has decided to construct a pipeline that will connect Ingolstadt in Germany with the terminus of the Friendship line at Litvinov in western Czechoslovakia **(Figure 1).**

In future, it is also likely that both crude and product pipelines will be constructed to connect Bratislava in Czechoslovakia to OMV's Schwechat refinery near Vienna. This would permit product transfers between the two countries, and give Slovakia access to the TAL system from Trieste on the Adriatic Sea.

If there is another universal problem in the East European market, it is that product supply and retailing infrastructure is wholly insufficient. There is the need for additional bulk storage, higher pumping capacity at existing retail outlets, as well as for more stations. Pipelines in many countries are old and in need of replacement.

To date most direct investments or joint ventures in the region by Western companies have involved retail operations. This reflects the fact that retailing is less capital-intensive than refining, and is therefore less risky.

Since many of the former Warsaw Pact nations aspire to EC membership, there are long-term benefits to those able to accept substantial short term risks. ■

Timor Gap 'no bonanza'

By William Scholes

'I think the time is ripe for an annual event which could address continuing growth in the Timor Sea and the forthcoming Timor Gap region. As well I would anticipate it would take on a regional flavour involving Indonesia, Papua New Guinea and other areas of oil and gas activity not too far distant. I would expect key industry and government figures from those regions to attend and to deliver keynote addresses'.

Northern Territory Minerals and Energy Minister Brian Coulter at the Australian Petroleum Exploration Association 1990 Conference

And so it was. South East Asia Australia Offshore Conference 91 was held in Darwin from 30 July to 2 August as a special forum bringing together for the first time leading figures from Asian, Australian and international oil scenes to discuss the interaction of economic, political and environmental issues affecting the future of oil and gas development in the region in the aftermath of the Gulf war.

One hundred and fifty oil and gas executives attended the conference. Overseas countries represented included Japan, Indonesia, Malaysia, USA, Papua New Guinea, Kuwait, Singapore, Italy, Norway, France, Great Britain, Brunei and Vietnam.

The conference took place at a time when the ASEAN region is projected to have the fastest growing economies in the 1990s. Correspondingly, the ASEAN demand for petroleum products is projected to grow at a faster rate than anywhere else. Undeveloped or unutilised potential in Australia and ASEAN has never been more attractive or vital. This promising region, home to some of the richest offshore zones in the Asia Pacific, will now be the scene for accelerated exploration, production and downstream activity.

Managing Director of Woodside Petroleum Ltd Charles Allen said that 'Although the Timor Sea has the potential for good discoveries, it is not likely to be the great bonanza that some would wish to believe'.

Woodside has held interests in the Timor Sea since 1963 but exploration was frozen in the area for the past 13 years because of a boundary dispute with Indonesia. Under a treaty signed 18 months ago permit areas are being released, sparking new optimism.

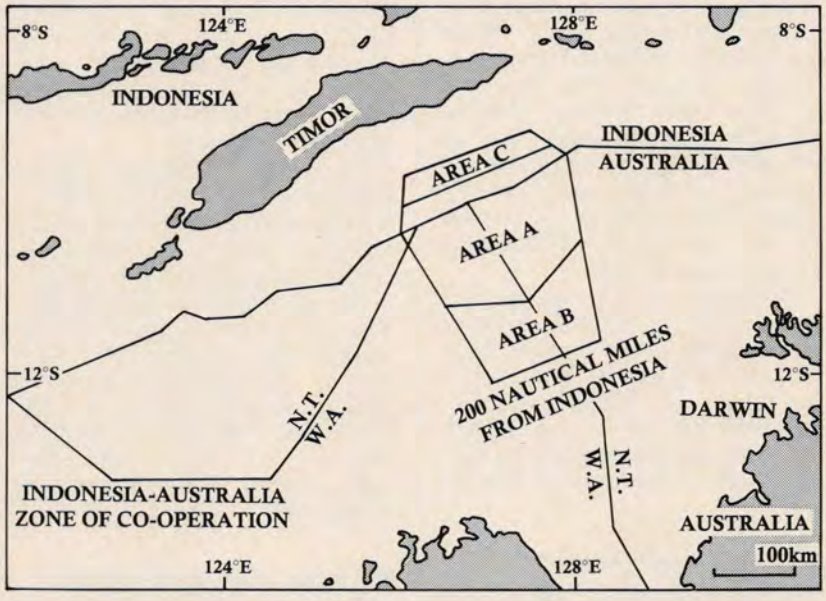
But Mr Allen said the euphoria had been premature. 'Woodside, although it is keen to maintain its interests in the Timor Sea, does not see the region as becoming a major hydrocarbon province,' he added. 'One misconception which has crept into people's thinking over the past decade revolved around the so-called Kelp structure which has been depicted on maps as a large amoeboid blob, but the reality is likely to be that, although it is a fairly large massif, it will be split by much minor faulting.'

Mr Allen said the rate of success in Timor was also a matter for concern. After the initial enthusiasm sparked by the Jabiru, Challis and Skua discoveries, which caused companies to submit massive work programmes, there had been a lack of success, with one commercial field in every 15 wells.

More optimism

Conference delegates in Darwin heard the Australian government reject warnings that legal wrangling would delay oil exploration in the Timor Gap, saying drilling work would commence within 18 months. Despite claims tht disputes over permits might delay exploration until the end of the decade, the government said development plans were on track for the Zone of Cooperation between Australia and Indonesia.

A spokesman for Federal Resources Minister Alan Griffiths who attended the conference said contracts would be announced in December. Bidding closes on 7 October. ■



Timor Sea

The EUROPA nuclear log calibration facility

By Drs J Butler and CW Cottrell, AEA Winfrith

The techniques for nuclear logging of oil and gas wells have undergone a rapid and dramatic development in the last decade. New developments in instrumentation and both computer hardware and software have enabled much greater scope in the measurements that can be performed down-hole. Nuclear techniques are now routinely used for density, porosity and mineral identification in open boreholes as well as providing, almost exclusively, fluid saturations and depth control information through casing. These measurements are made in a complex and hostile environment, sometimes while the formation is being drilled. Interpretation of these measurements is a complex problem and understanding of the tool responses has to some extent lagged behind the developments in drilling technology. One of the keys to accurate interpretation is the primary calibration of the tool response which is usually achieved in carefully controlled laboratory measurement systems or calibration test pits.

Historically, the primary standards built by the American Petroleum Institute (API) have provided the basis for the calibration of porosity and natural gamma-ray tools. There are at present very few independent calibration facilities worldwide, with none in Western Europe, other than the SPARTAN demonstration plant at Winfrith. In general, again excluding SPARTAN, the existing facilities do not cater for MWD, cased hole situations to calibrate pulsed neutron tools and have no facilities to determine environmental corrections.

The larger service companies have extensive test pits and wells on which they base calibration of their own tools. However, as they all have commercial advantage as the basis for their business, they are not in a position to constitute independent industry standards such as those provided by the API.

Calibration needs

Primary calibration of logging tools requires the measurement of the response in a suitable environmental test facility. This facility must be of sufficient size to provide a realistic environment for the measurement compared to field applications, including a borehole of representative size. The relevant geophysical parameters of the test facility must be representative of field conditions and specified to a suitable accuracy.

Testing a logging tool in a test pit.

The API pits at Houston comprise three clean (shale-free) limestone formations with porosities in the range 1–3 percent (Carthage Marble), 17–26 percent (Indiana Limestone) and 25–30 percent (Austin Chalk) respectively. This facility provides logging companies with four (including water) basic porosity calibration points which are internationally recognised. However, the API does not provide a full range of test conditions such as different lithologies, borehole sizes, formation fluid or salinities.

Computer validation

In the course of earlier work carried out at Winfrith, Monte Carlo calculations were undertaken for a particular tool in the API pits, using proprietary drawings supplied by a logging company. The results are illustrated in **Figure 1.**

Whilst the slope of the curve of count-ratio versus porosity was well reproduced, the absolute values were under-predicted by some 10–15 percent. Sensitivity calculations, carried out with the McBEND Monte Carlo code, indicated that this discrepancy could be accounted for if the limestones were assumed to contain a boron equivalent of about 17ppm by weight. No trace-element compositions are available for these pits but measurements which have been made subsequently of the thermal neutron absorption cross-section and the trace element content by prompt-gamma analysis on limestone, including Carthage Marble, have confirmed trace impurity levels of about this value.

The presence of such contaminants does not necessarily invalidate a test pit standard provided that it is used by all logging companies and, moreover,

that the differences between the test pit environment and operational formations can be adequately estimated. However, it is important that the composition of test formations, including these trace elements, does not change significantly over the porosity range so that a unique calibration lithology can be defined.

EUROPA facilities

The EUROPA facility is currently being constructed by AEA Petroleum Services at the Offshore Technology Park, Aberdeen, to meet the current and perceived needs of the industry. EUROPA will contain 20 full-size test formations of accurately known composition and nuclear radiation transport properties.

Formations will be provided having two borehole sizes, consistent with typical borehole diameters encountered in the North Sea. Each formation will be fully saturated with either pure water or a saline solution using vacuum saturation equipment and installed in the test tanks to provide two formations per tank. It is intended for the tanks to contain formations with the following characteristics:

- A range of porosities (low, medium and high values each) for sandstone, limestone and dolomite lithologies with fresh water as both formation and borehole fluid in 8.5″ boreholes.
- Replication of at least four of these formations (two sandstones and two limestones) with 12.25″ borehole diameters.
- A range of formation absorption cross-sections up to about 50 capture units (cu) to be obtained by combinations of formation, porosity and formation fluid.

Apart from these basic facilities ancillary equipment will include liners to simulate borehole casing and cement with suitable equipment for change of borehole fluids in at least two formations.

With these facilities it should be possible to test or calibrate neutron porosity and neutron lifetime tools. The borehole sizes and crane headroom and rating are such that both wireline and MWD tools may be operated in the plant.

Additionally a set of reference test blocks (generated under a separate research programme) for testing the calibration of gamma-density tools will be installed.

Computer modelling

The Monte Carlo code McBEND plays an important role in the process of characterising the test formations. This method can be described as a 'theoretical experiment' conducted on the computer which uses random numbers to follow the histories of individual nuclear particles from birth in the source to death by adsorption in the borehole or formation. It can furnish an exact representation of the geometry and the cross-section parameters embodied in the nuclear data libraries. The accuracy of the predictions, however, will depend on the quality of the characterisation data, in particular, the chemical composition (including trace elements) and any spatial inhomogeneities in the test formation. It has also been observed that, in some formations, the accuracy of the basic nuclear cross-section data is a limiting factor and measurements are being made to refine the McBEND data set. In order to achieve this high degree of characterisation in natural rocks, it is necessary to use a range of nuclear techniques in addition to conventional chemical and physical analysis including both core analysis and bulk scanning techniques.

Having obtained values for all of the characterisation data set Monte Carlo simulations of logging tool responses in each of the formations will be carried out. The logging tools used in these calculations form a reference set designed and manufactured by AEA Petroleum Services. The results calculated by the McBEND code are being compared with the measured responses and agreement is sought within the estimated uncertainties, which do not generally exceed a few percent. Sensitivity analysis can be used to investigate the cause of larger discrepancies which may be due to inhomogeneities in the rock slabs. This approach leads to a high standard of characterisation which has not previously been achieved in test formation design.

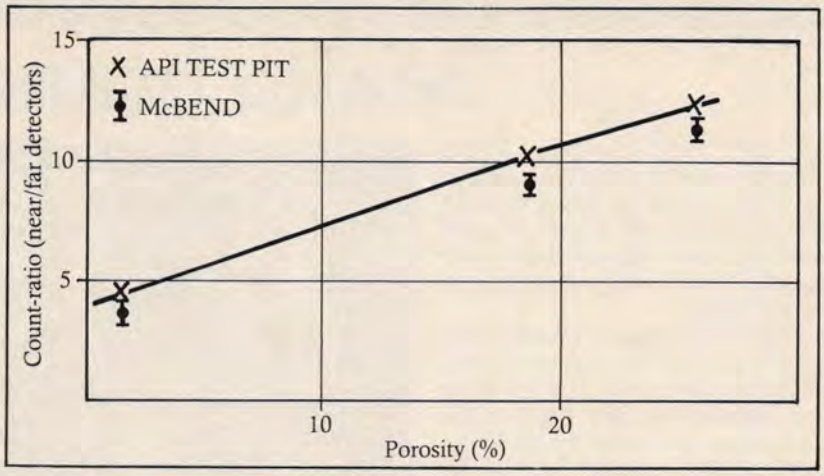


Figure 1 Comparison of McBEND predictions and API test pit calibration measurements.

The EUROPA facility in Aberdeen, currently being constructed, will provide a complete calibration service for neutron and gamma logging tools. The facility will have five main functions:

- The primary calibration of logging tools against industry recognised standards.
- The validation of environmental corrections determined by computation and/or experiments.
- The recalibration and testing of tools prior to or following logging runs.
- Back-to-back comparison of tools to resolve discrepancies in field data.
- The provision of an environment for the development of new tools.

A three year R & D programme is currently underway (in its third year) to characterise the test formations and develop new procedures for calibration utilising nuclear measuring techniques and Monte Carlo modelling. Funding is provided by a consortium of 12 companies*, the Offshore Supplies Office of the Department of Energy and the Scottish Development Agency. Partial support has also been secured from the TDHS programme of the European Commission.

When characterisation and testing is complete, operators, service companies and research organisations will be able to hire the facilities on a daily and confidential basis. ■

***The companies are: Amerada Hess, Amoco, Arco, BP, Chevron, Conoco, Exxon, Gas Council, Mobil, Shell, Statoil and Total.**

Malta branch

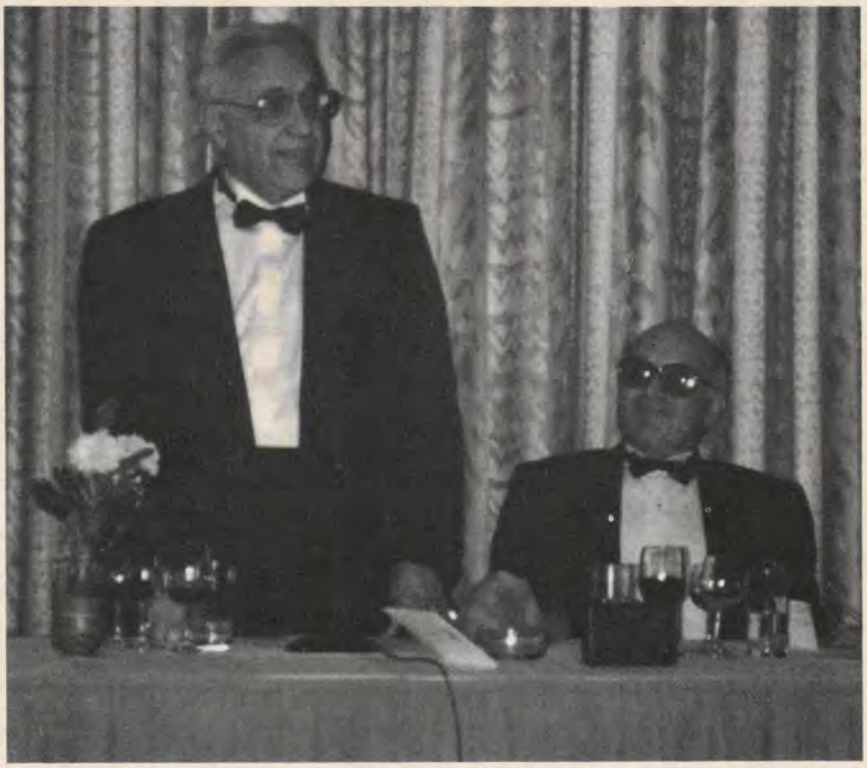
The Institute of Petroleum Malta Branch held its inaugural meeting on 1 October 1991. During the short period in which it has been active the branch has held two seminars and has established itself amongst Malta's other leading professional bodies.

Its first Annual Dinner was held on 19 April this year and was attended by over 140 members and guests. Speakers at the dinner included Mr Basil Butler OBE, President of the Institute of Petroleum, Dr Joe Fenech, Parliamentary Secretary for Offshore and Maritime Affairs and Mr John D'Ancona, Director General of the Offshore Supply Office at the UK Department of Energy.

Mr John D'Ancona congratulated the Institute on establishing a branch in Malta adding that it was a timely event as Malta's search for oil and gas gathers momentum and when major projects are planned in neighbouring Mediterranean countries.

Dr Joe Fenech commented on the two conferences which the Malta Branch is helping to organise in conjunction with Spearhead Exhibitions and Mediterranean Oilfield Services Company Limited. The first is the 'Clean Seas' exhibition and conference to be held in November this year and the second is in January of next year — 'The Mediterranean Oil and Gas Exhibition and Conference' (MOEX).

Dr Fenech thanked the Institute for creating the Malta Branch at a time when the Maltese government had committed itself to internationalising Malta and to promoting the country as an international service centre. The government hopes that the two conferences, and in particular MOEX, will become successful international events of calibre in the oil industry. By attracting visitors to the country it will help Malta become a regional oil centre; and there is optimism that oil will soon be discovered offshore both south and north of the island.



The Hon Dr Joe Fenech, Parliamentary Secretary for Offshore Activities and Maritime Affairs (standing) and Mr Frans Said, Chairman of IP Malta Branch.

Mr Butler conveyed the very best wishes of Council and members of the Institute and hoped that the Malta Branch would go from strength to strength to become a body to which the government and people of Malta could turn to for reliable information on the oil industry. In the future he hoped that the Institute and industry would jointly contribute to Malta's economy.

New members for the IP and branch are being actively recruited in Malta and other Mediterranean countries — the two conferences planned will certainly contribute to this campaign. Further details of the conferences are available from Spearhead Exhibitions Limited, Rowe House, 55–59 Fife Road, Kingston upon Thames, Surrey KT1A 1TA. Tel: (081) 549 5831.

Jane Thompson

EXPLORATION AND PRODUCTION DISCUSSION GROUP

The next meeting of the E & P Discussion Group will be held at the Institute of Petroleum on **Thursday, 19 September 1991** starting at 5.30 pm. (Tea and biscuits will be available from 5.00 pm.)

Future outlook for the offshore drilling industry

Speaker: **Mr JS Foulkes,** Head of Drilling, Total Oil Marine Ltd.

If you would like to attend this meeting please contact **Mr AE Lodge,** Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR. Telephone 071 636 1004 Ext 236.

. . . standardization news

ASTM D02 meeting, Toronto 23–28 June 1991

As is usual, the IP sent an official delegation to this meeting, led by Ivor Smith who was accompanied by Mike Sherratt. Set out below are brief extracts from the 'Delegates Report' which was compiled by the delegates, with additional contributions from Bob Hooks and Mike Hurcombe.

Technical achievements

ASTM should be commended on a number of technical achievements. These included;

a) Some excellent test method round-robin reports.
b) A fine presentation on the impressive work of the task force charged with resolving the issues of toluene standardization fuels for use in engine tests.
c) Final completion of the issue of the grease cone penetration test cone smoothness.
d) The cloud point user equipment survey.
e) The interest shown in the IP's work on H_2S in fuel oils.
f) The outliers workshop held by SC7.

ISO test methods

The issue of whether ASTM will print/adopt methods in ISO format is still not resolved, it would seem most unlikely in the near future.

General comment

A strong impression was gained that despite the internal frustrations D02 may have (especially in relation to terminology issues), ASTM is strengthening its defence and application of its consensus standards procedures arrived at through the 'due process'. This is probably in part a reaction to the possibility that any other organisation, (such as ISO), could become recognised as a higher standards authority, thus usurping the leadership and excellence that ASTM believes it has in the standards field. This represents the surfacing of a fundamental clash of principle between standards derived from 'public' consensus as against those derived only through consensus of technical experts. The practical effect of this will almost certainly be growing resistance by ASTM to both the adoption of other standards, (eg from ISO), and continuing the practice of publishing joint standards, (eg with IP). In the latter case, it could mean a reversal of the agreement reached between IP and D02 that technical and not editorial equivalence was all that was needed for joint standards.

ASTM award for Ivor Smith

To his complete surprise Ivor Smith was presented with a D02 Certificate of Appreciation by Ed White, the D02 chairman. In his response Ivor said how much he felt a personal sense of honour as a non-ASTM member and a non-American to receive the award. He felt the award reflected as least as much recognition of the IP as it did of himself.

Notice of withdrawal of test methods

IP 275 Microscopically sizing and counting particles from petroleum-base aerospace hydraulic fluids.
IP 327 Counting and sizing particulate matter in aerospace hydraulic fluids using a HIAC particle counter.
IP 320 Sampling and processing aerospace hydraulic fluids for particle contamination analysis.

The Fuels and Light Distillate Sub-Committee ST-B have proposed that the above three methods be withdrawn. A notice will be placed in the 1992 IP Test methods book and the methods withdrawn in 1994 unless a case is made for their retention.

Objections to this proposal should be sent to John Phipps at the IP.

Modifications to the apparatus used in IP 40/ ASTM D525 and IP138/ASTM D873

Following a history of occasional risks encountered in the use of the existing apparatus defined in IP 40/ASTM D525 when testing certain gasolines or gasoline components, and an investigation of the factors that may contribute to the hazards, IP Sub-Committee ST-B, acting on the advice of Panel ST-B-8, overwhelmingly sanctioned a change to the apparatus for the 1992 method revision.

The change involves the addition of a burst-disc assembly in the oxygen delivery tube, with a relief pressure of 1530 kPA, which will become part of the manufactured apparatus. Existing apparatus will require a new assembly complete with a burst-disc for each 'bomb' destined for the testing of motor gasoline or gasoline components. The modified components are expected to be available before the end of 1991.

The above changes in apparatus do not necessarily apply to IP 138/ASTM D873, which relates only to the testing of aviation fuels, and uses the same apparatus, but will be included in this method as an option.

A list of the suppliers of the modified apparatus can be obtained from the Technical Officer (Standardization) at the IP.

Lubricating grease general tests panel STD-1

The Institute of Petroleum Test Panel STD-1 is involved with the general testing of lubricating greases. The panel includes members from manufacturing, major oil companies research establishments — both UK and Europe, Ministry of Defence and chemical companies associated with lubricant technology.

STD-1's current activities include revising existing IP test methods and developing new ones, and providing technical input for the development of national, European and international lubricating grease test methods.

In order to ensure that these test methods meet present day requirements the panel needs input from all parts of industry where lubricating grease is either made or used. To this end the panel is always interested in hearing from anyone who considers that they can make a contribution to the work of STD-1. For further details contact John Phipps at the IP.

ENVIRONMENT DISCUSSION GROUP

The following meetings have been arranged:

Tuesday 15 October Biological recovery following oil spills around the world

Tuesday 12 November Biological treatment of liquid effluents

These meetings will be held at the Institute of Petroleum starting at 5.30 pm. (Tea and biscuits available from 5.00 pm).

For further information contact **Mr AE Lodge** at the Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR. **Tel: 071 636 1004.**

Organisation development — friend or foe of human resource departments?

At a recent meeting of the Institute's Personnel, Education and Training Discussion Group, Trevan Hingston, independent management consultant and former Head of Group Personnel Relations, The Royal Dutch Shell Group, presented a paper on 'Organisation development — friend or foe of human resource departments?'

Mr Hingston began his talk by reviewing the history of the personnel function and describing how it evolved into the modern human resource function. He described how the first personnel departments started to appear from a number of different origins between the two world wars. There was a feeling that by better treatment of people the influence of trade unions could be weakened or their presence avoided altogether. Then there was a reaction to the school of scientific management with its work study, assembly lines etc. Scientific management was apt to generate complicated pay systems and their introduction and development became, for some companies, the nucleus of a personnel department. The kind of personnel work generated was mainly of a collective nature.

World War II intensified some of these personnel activities and added two more. In industry, the need for a level of productivity higher than anything known in peacetime led to the realisation that people could be trained to perform tasks of considerable complexity in much less time than had been previously thought possible.

Starting in the mid 1950s, employers came to realise that additionally, it was worth taking systematic steps over the recruitment, development, and deployment of senior and professional staff in particular. To support the concept, job evaluation, formal staff appraisal, and new remuneration practices became normal. Company pension schemes also became widespread. These activities were mainly concerned with the individual.

By 1970 the modern personnel or human resource department had arrived in which there were two groups of activities under one top executive who was called the personnel or human resource director or manager who reported to the highest decision-taking body of the company. One group of activities was primarily concerned with collective matters such as legislation, trade unions, consultations, salary scales, job evaluation, and policies such as retirement benefits that affected groups, or all employees. The second group of activities was about matters affecting individuals eg recruitment, training, career development, and individual salaries. Manpower planning was probably in the second group of activities although it was more likely to be spoken about than practised!

This approach to personnel activities looked fine but all was not universally well. What things were liable to go wrong? First, more systems were invented than were successfully maintained. For example, staff reporting systems were found to fall further and further behind, career moves were driven by crisis rather than planning, special payments were made to individuals at the demand of strong bosses, job evaluation panels were rigged or ignored, disciplinary and grievance procedures were by-passed. Second, some top managements only interested themselves in the development and remuneration of a few particularly promising staff and those in the highest job grades. It was felt that those tasks could be performed by any executive who knew the company and had grey hair! Some such people became personnel directors and the function tilted away from collective considerations and therefore became unbalanced. The same error occurred when, in view of the importance of trade union relations, an industrial relations specialist, with no feel for the individual side of the job, became a personnel director.

These errors could be attributed to a failure to perceive the need for, and a failure to practise, personnel management, which is a holistic activity, as opposed to being the sum of a number of parts. All personnel units, and what they do, must fit together. They are not an assemblage of separate skills that happen to be co-located organisationally but they must be managed as an integrated whole. That is why the teaching of personnel management as several separate subjects is dangerous. What therefore is personnel management? It is an endlessly repeated process involving the weighing of every aspect of the human resources of the company, considering the environment in all its aspects, and in answering the question 'Where are we now?'. Then, bearing in mind the plans and goals of the business answering the question 'Where do we want to be?'. Then should come the elaboration of a strategy to enable the company to progress from the present situation to the defined future position in accordance with a specified timescale. The wind may blow and the tide run but all the crew will know which port is the destination.

Organisation development (OD) can mean either the practical application of the behavioural sciences or the results of pressure of competition forcing top management to search for better ways of organising a business. The two may overlap if the first is used to help deal with the second. In the first alternative lie many gurus, many charlatans, many imitators and some extremely valuable contributors. If an outside OD consultant is to be used then:

- Have in-house expertise to guide and work with the external specialist.
- Stop all jargon as soon as it appears.
- Ask the external specialist what theoretical framework he or she uses — a good OD consultant will explain the underlying structure while a poor one will waffle.
- Only hire an external consultant when a real need has been identified.

In the second alternative, reorganisations require all relationships to come under sharp examination coupled with a relentless drive for better and more economical ways of running companies. If the human resource (HR) department is not involved from the conception of the reorganisation then something is wrong. Perhaps the HR department should be taking the lead if the costs of employing staff are out of line or some other personnel activity malfunction is manifest.

HR department rules should include:

- Do not allow management to believe that good staff are collectively infinitely flexible in terms of the kinds of business they can handle. That sort of misplaced belief leads to bad diversifications.
- Management may need to be reminded that the way change is brought about is likely both to influence the degree of its acceptance, and that an imposed solution in a company unused to such things will create a new company for better or worse.
- Use a framework like the seven Ss — Staff — Superordinate goals — Structure — Style — Strategy — Systems — Skills. All seven need to be kep in balance.

So is OD the friend or foe of HR? The answer is the same for both kinds of OD. It is a friend to the well-run HR department which will use consultants sensibly and when needed, and will be among the policy-making and executive groups when major change is imperative. OD will only be a foe to the timid or inadequate HR department which permits external consultants to lead them by the nose in both cases, and which finds it hard to keep up with evolving situations.

New qualifications for industry — an IP involvement

Over recent years the government has expressed concern that 'Great Britain plc' is being outperformed by its competitors; this threat comes not only from Europe and the changes that 1992 will bring, but also from America, Japan and the Pacific rim countries. Currently only 40 percent of Britain's workforce has access to qualifications relevant to its work.

Further, in the next decade, Britain will have fewer young people available to provide its management and labour, and more will be expected out of the existing adult workforce.

These three facts — the increasing pace of change, Britain's uncompetitive performance, and the demographic shift — have been the main influences on recent government industrial policy. In particular, the area of vocational education and training (VET) received a major stimulus from the New Training Initiative (NTI) launched in 1981 by the Manpower Services Commission (MSC). This called for a workforce which was highly skilled, technically competent, versatile, adaptable and mobile.

Key aspects of NTI were that:

- VET would be based on occupational standards.
- Open access to training would be encouraged.
- There would be an emphasis on youth training.
- The principle of transferability of skills and competences would be highlighted.
- There would be wider opportunity for unqualified adults.

The central feature of NTI is the development of new occupational standards based on competent performance in the workplace. These standards have many uses for employers — career development, training strategy, personnel policy, personal appraisal etc. Their overall aim is to improve industrial performance.

In 1985 the government carried out a review of vocational qualifications and, a year later, the National Council for Vocational Qualifications (NCVQ) was set up. Its brief was to establish in England, Wales and Northern Ireland a simple, and comprehensive framework of National Vocational Qualifications (NVQs) based on the new standards. In Scotland, the Scottish Vocational Education Council (SCOTVEC) is similarly responsible for Scottish Vocational Qualifications (SVQs).

These NVQs and SVQs indicate competence in employment; this means not only the possession of knowledge and skills, but the ability to apply them at work. The benefits of NVQs and SVQs are that they are:

- Relevant and accessible.
- Part of a national framework.
- Transferable in part or in whole.
- Encourage progression.
- Increase skill levels and quality of performance.
- Of immediate currency and value to employers.

What does the framework of NVQs and SVQs look like? NCVQ and SCOTVEC have defined five levels of qualifications, broadly described as follows:

Level 1 — competence in the performance of routine activities and/or achievement of a broad foundation of work competence as a basis for progression.

Level 2 — competence in a broader range of work activities involving greater individual responsibility.

Level 3 — competence in skilled activities which are complex and non-routine, including those that are supervisory.

Level 4 — competence in the performance of complex, technical and specialised activities, including supervision and management.

Level 5 — competence in the pursuit of a senior occupation or profession including the ability to apply a significant range of fundamental principles and techniques. Also, extensive knowledge and understanding of the field and appropriate managerial capability.

As the least qualified sectors of British industry are at craft and operative level, the early emphasis of NVQs and SVQs has been at Levels 1 to 3 with some extension to Level 4.

More recently, the government has demanded that the framework should be extended to Level 5. In order to make a contribution to the development of standards of competence at Levels 4 and 5 for the process industries, the Institute of Petroleum is represented on the Process Industry Standing Conference (PISC) which has been established by the Engineering Council at the request of the Training, Education and Enterprise Division of the Department of Employment.

Publications

Facts about engineering opportunities 1991. Features 50 company profiles on everything a student or graduate wants to know about future employment and training opportunities. Available from Industry Ventures Ltd, Unit 2, Epirus Mansions, Epirus Road, London SW6 7UJ.

Training — Developing Skills for the Future of the Offshore Industry. Government, academic and industry schemes and initiatives geared to training for the offshore oil and gas industry. Copies available from Mrs J Townsley, Room 530, Offshore Supplies Office, Alhambra House, 45 Waterloo Street, Glasgow G2 6AS.

Education for Work. A Guide for Industry and Commerce from the National Curriculum Council, Albion Wharf, 25 Skeldergate, York YO1 2XL.

Mr Ernie Edwards (second from left) was recently awarded an Institute of Petroleum Student Prize for outstanding performance on the MSc course in Petroleum Engineering at the Royal School of Mines, Imperial College in the 1989/90 academic year. Similar prizes were awarded to Mr Lindsay Butler (centre) and Mr Robin Freeman (second from right) who were joint winners of the IP Student Prize for the MSc course in Offshore Engineering at the Robert Gordon Institute of Technology in the 1990/91 academic session. Also present were Mr Basil Butler OBE (left), Institute President and Mr Ramsay Spence OBE (right), Chairman of the IP Aberdeen Branch.

Around the Branches

Aberdeen

Secretary: Dr RL Green, BP Petroleum Development Ltd, Farburn Industrial Estate, Dyce, Aberdeen AB2 0PB. Tel: 0224 832225.

8 October: 'Ninian — The Next Decade', Alan Higgins, Chevron UK Ltd.
12 November: 'North Sea Safety', Tony Barrell, Health and Safety Executive.
22 November: Annual Dinner — Guest Speakers: Mr John Collins, Chairman of Shell UK and Mr Richard Coe-Hamilton, Chief Executive, Clydesdale Bank Plc.
10 December: 'The Work of the Oil Spill Response Service Centre', David Salt, Oil Spill Service Centre, Southampton.

1992

14 January: 'The Work of the Offshore Chaplain', Reverend Andrew Wylie, Scottish Churches Industrial Mission.
11 February: AGM and presentation and tour of The Offshore Survival Centre, Offshore Survival, Robert Gordons Institute of Technology.
10 March: 'Operational Experience with Seillean (SWOPS)', Mr John Wright, BP Exploration Operating Company Ltd.
14 April: 'Open Learning Offshore', Mr Frank Jenkins, Petroleum Open Learning Aberdeen.

Edinburgh and South East Scotland

Secretary: Dr RJ Hutchison, Polyethylene Group Offices, BP Chemicals Ltd, PO Box 21, Bo'ness Road, Grangemouth, Stirlingshire FK3 9XH. Tel: 0324 493339.

10 October: 'Nissan — Driving towards 2000', Mr R McIntosh, Director, Advanced Engineering, Nissan, (joint meeting with Institute of Measurement and Control).
7 November: 'Prospects for Renewable Energy in Scotland', Mr R Morris, Group Head, Energy and Environmental Technologies, Scottish Enterprise.
12 December: 'Environmental Audit — The plain facts!', Dr P Upton, Manager, Dames and Moore UK, (joint meeting with the Pipeline Industries Guild).

1992

16 January: 'Heavy Metal Reverberates to Cultural Change', Mr R Taylor, Chairman, The Taylor Group.
20 February: 'Contract Management: Some keys to success', Dr J Morse, Project Director, Grangemouth Development, BPC, (joint meeting with IChemE).

Essex

Secretary: Mr AL Carlson, 471 Kents Hill Road North, Thundersley, Benfleet, Essex SS7 4AD. Tel: 0268 794615.

16 October: 'Bitumen, Ancient and Modern', Mr TS Hoben, Technical Manager, Shell Bitumen.
13 November: Ladies Evening — 'Wines of Europe', Mr PA Gibb, Branch Manager, Peter Dominic Ltd.

1992

8 January: 'The Role of the Independent Inspection Company', Mr AH Edwards, AH Edwards Consultants Ltd.
12 February: AGM followed by 'Oil Spill Response on the Thames', Captain P Bush, Assistant Harbour Master (Lower District) and Oil Pollution Officer, Port of London Authority.
11 March: 'Eurotunnel, the Channel Tunnel', Mr R Storer, The Channel Tunnel Group Ltd.
20 March: Dinner Dance.

Humber

Secretary: Mr G Stratford, LES Engineering Ltd, Armstrong Street, West Marsh Industrial Estate, Grimsby, South Humberside DN31 1XD. Tel: 0472 353516.

17 October: 'Humber Tugs Past and Present', Mr LAJ Dalrymple, Managing Director, Humber Tugs.
25 October: Dinner Dance.
28 November: 'Eurocell Project', Mr RJ Bass.

1992

23 January: 'Refinery Construction and Maintenance', by Fluor Daniels.
13 February: AGM followed by 'Alternative Fuels', speaker to be announced.
28 February: Annual Dinner.
9 April: Ladies Night.
13 May: 'Pilot Operations Past and Present', Mr C Wilkin, Pilot Operation Manager, ABP.

London

Secretary: Mrs E Walker, Conoco Limited, Conoco House, 230 Blackfriars Road, London SE1 8NR. Tel: 071 408 6357.

24 September: 'Hydrotreating, Reforming and the Crystal Ball', Mr P Aston, Criterion Catalysts.
23 October: 'Current/Future European Fuel Quality and Vehicle Emissions Standards', Mr J Feltham, Department of Energy.
14 November: 'Piper Alpha and the Cullen Report — The Aftermath', Dr BGS Taylor, UK Offshore Operators Association.

1992

14 January: 'Direct Gas Marketing', Mr FP Cooke, Quadrant Gas.
18 February: 'Trends in Automotive Fuels and Lubricants', Mr NJ Tilling, Paramins Group, Exxon Chemicals.
10 March: 'Renewable Energy', Professor DT Swift-Hook, King's College, London.
20 May: 'Integrated Pollution Control', Dr J Marshall, HM Inspectorate of Pollution.

Malta

Secretary: Mr M Degiorgio, c/o MEDSERV, Manoel Island, Malta. Tel: 356 335408/9.

19–22 November: 'Clean Seas 91 Conference' co-sponsored by IP Malta Branch.

1992

28–31 January: 'Mediterranean Oil and Gas Exhibition' co-sponsored by IP Malta Branch.

Midlands

Secretary: Mr D Johnson, Edgar Vaughan & Co Ltd, Legge Street, Birmingham, West Midlands B4 7EU. Tel: 021 359 6100.

16 October: 'Transportation of Hazardous Materials', Sergeant Lewis, West Midlands Police.
13 November: 'Diesel Emissions', Dianne Hall, BP International.
6 December: Greek night out.

1992

22 January: 'Recycling Processes', Mr DJ Neadle, Smallman Lubricants.
12 February: AGM.
15 April: 'The Role of Management Consultancy in the Petroleum Industry', Mr AP Miskin, KPMG Management Consultancy.

North East

Secretary: Mr JM Sparke, Phillips Petroleum Co UK Ltd, Teesside Operations, Seal Sands, Middlesbrough, Cleveland TS2 1UH. Tel: 0642 546411.

4 October: Branch Dinner.
12 November: 'Gas from the North Sea to Teesside — A description and progress report on the Amoco CATS project', Mr D Nelsen, Amoco.
12 December: 'Quality Assurance in TQM', Mr SRR Kirk, ICI Ltd.

Northern

Secretary: Mrs E Gillatt, 53 The Woodlands, Lostock, Bolton, Lancs BL6 4JD. Tel: 061 764 5981.

26 September: Golf Day.
15 October: 'Making Clear Grease', Mr J Cliff, Ironsides.
12 November: 'Futures and the Spot Market', Mr G Watson.
29 November: Dinner Dance, guest speakers Mr Basil Butler OBE, President of the IP and Mr T Wilkinson, Chairman of Blagden Industries plc.

1992
14 January: 'Drilling Muds', Mr R Gough, AKZO.
18 February: AGM followed by 'Emprox and Synthetic Metal-working Fluids', speaker from ICI.
6 April: Hot Pot Supper.

Southern
Secretary: Mr RL Shaw, Esso Petroleum Co Ltd, Esso Refinery, Fawley, Southampton SO4 1TX. Tel: 0703 896021.

4 October: Visit to Fawley Refinery.
15 October: 'Aircraft Accident Investigation', Royal Aeronautical Establishment (joint meeting with the IMechE).
22 November: 'Defence Procurement', George Eynon, Woolwich.
3 December: 'Safety Year 1992', Dr Waldridge, (joint meeting with IEE).
13 December: Visit to the Ordnance Survey.

1992
22 January: 'Patents Office'.
19 February: Visit to the Air Traffic Control at Segensworth.
4 March: Talk by Sir Colin Marshall, Chief Executive of British Airways.

Stanlow
Secretary: Mr J Jagannathan, Shell UK Ltd, PO Box 3, Oil Sites Road, Ellesmere Port, South Wirral L65 4HB. Tel: 051 355 3600 x 4304.

11 October: Works visit — Tour of Wrexham Lager Brewery.
27 November: 'Fast Track Project Management', Mr H Wang, Shell UK Oil, (joint meeting with IChemE).
29 November: Annual Dinner Dance.

1992
22 January: AGM followed by 'European Market Related Topic', Mr JA Perry, BP Oil (Europe).
19 February: 'Emission Controls in Combustion Plants', Mr R Baker, Babcock Energy, (joint meeting with the Institute of Energy).
26 March: 'Safety Worldwide', Mr R Pickering, ICI, (joint meeting with the IMechE).
30 April: 'Are Oil Refineries Clean Enough', Mr D Pounder, Department of Environment, (joint meeting with SCI).

Shetland
Secretary: Mr PN Guy, BP Petroleum Development Ltd, Sullom Voe Terminal, Mossbank, Shetland ZE2 9TU. Tel: 0806 243437.

12 September: 'Archaeology', Val Turner.
14 October: 'Subsea Development'.
1 November: Annual Dinner, Guest Speaker Dr Harold Hughes OBE, Director General UKOOA.

1992
18 February: AGM.

South Wales
Secretary: Mr IJ Thomas, BP Oil Llandarcy Refinery Ltd, Britannic House, Llandarcy, Neath, West Glamorgan SA10 6HJ. Tel: 0792 322269.

17 September: 'Leeches', Dr R Sawyer, Biopharm.
24 October: 'Safety Measurement and Control', Mr G Farnell, International Loss Control Institute.
21 November: 'Expert Systems in the Oil Processing Industry', Mr P Andow, KBC.

1992
21 January: 'Explosives Awareness', Mr K Callaghan, MOD.
20 February: AGM and 'Confessions of a Diet Counsellor', Mrs P Forrester.
19 March: 'Electricity Generation in the Future', Mr B Count, National Power.
27/29 March: Visit to Goonhilly Tracking Station, Cornwall.
30 April: 'The Work of the Field Studies Council', Mr C Walker, FSC.

West of Scotland
Secretary: Mr A Lowson, BP Exploration, 301 Vincent Street, Glasgow G2 5DD. Tel: 041 204 2525.

19 September: Branch Golf Tournament.
21 October: Celebrity Lecture.

1992
6 March: Petroleum Dinner.

Yorkshire
Secretary: Mr PD Osler, Osler Fuels Ltd, Battye Street, Laisterdyke, Bradford, West Yorkshire BD4 8AG. Tel: 0274 660418.

12 September: Ladies Evening: Visit to the National Museum of Photography and Television, Bradford.
8 October: 'Vehicles, Emissions, Fuels and Lubricants', Mr J May, Executive Engineer, Analytical and Environmental Services, Rover Group.
12 November: 'BS5750 Quality Assurance — An Assessors Point of View', Mr I Hodgkinson, Development Manager, Lloyds Register LRQA.
10 December: 'A visit to Ackrill Newspapers — aspects of producing the Harrogate Advertiser'.

1992
14 January: 'Running a Railway', Mr DJ Knight, Area Manager, British Rail.
11 February: AGM followed by Hot Pot Supper.
10 March: 'Power to the People', Mr G Willcox, Senior Engineer, Control Systems National Power (joint meeting with the Institute of Energy).
20 March: Dinner Dance.
17 June: Golf Tournament.

Obituary

Mr Hugh Munro (66) treasurer of the IP Irish Branch died on 7 July after a long illness.

Mr Munro qualified as an engineer from University College Dublin in 1946. He was an outstanding engineering student and qualified as one of the youngest and brightest graduates of his generation, winning the National University of Ireland bursary in Engineering.

In spite of his wide and demanding interests he remained committed to the principles and objectives of the Irish Branch of the Institute founded in 1979 and will be greatly missed.

New Collective Members

Petronas Penapisan (Terengganu) Sdn Bhd
24300 Kerteh, Kemaman, Terengganu Darul Iman, Malaysia.
IP Nominated Representative: Mr Syed Mohamed Syed Jaffar, General Manager/Chief Executive Officer.
The company, a wholly-owned subsidiary of Petronas, Malaysia's national oil company, owns and operates 30,000 b/d hydroskimming refinery, located on the east coast of Peninsular Malaysia. The refinery processes sweet light indigenous Malaysian crudes from fields in the South China Sea, particularly the bench mark Tapis blend. The refined products are marketed in the Asia-Pacific region.

Institute News

Compagnie Générale de Geophysique (CGG), UK Branch
CGG House, 4 Dukes Green Avenue, Feltham, Middlesex TW14 0LR. Tel: (081) 899 2400. Fax: (081) 899 2500.
CGG, founded in 1931, is a leading geophysical contractor. The CGG group includes four main subsidiaries: Sercel, AMG, Petrosystems and CGG Logging, and offers a complete range of geophysical services, equipment and computer systems throughout the world.

Platon International plc
Platon Park, Viables, Basingstoke, Hants RG22 4BS. Tel: 0256 470456. IP Nominated Representative: Mr R Bromley-Martin, Group Chief Executive.
Platon International plc is a manufacturer and distributor of process control equipment, both in the United Kingdom and Europe.

Kuwait Petroleum Lubricants Ltd
Knowsthorpe Gate, Cross Green Industrial Estate, Leeds LS9 0NP. Tel: 0532 350555. IP Nominated Representative: Mr AJ Tucker, Managing Director.
Kuwait Petroleum Lubricants Limited, as an affiliate of Kuwait Petroleum International, is associated with blending and marketing of lubricants, soluble oil bases and specialised metal working oils.

New Members

Allan, D, 26 Canmore Park, Stonehaven, Scotland AB3 2WJ
Anderson, JK, 20 Castlehill Drive, Newton Mearns, Glasgow G77 5JZ
Boxhall, RSG, Global Engineering (ME) Ltd, PO Box 8688, Doha, Qatar
Brain, D, 26 Rydal Avenue, Redcar, Cleveland TS10 1HY
Chapman, S, Flat 4, 189 Trinity Road, London SW17 7HL
Chaudhuri, TK, 149 Shirland Road, London W9 2EP
Edwards, GG, 6 Ivy Mill Close, Godstone, Surrey RH9 8NG
Fardey, N, 13 Long Pastures, Werrington, Peterborough, Cambs PE4 5AX
Freeth, J, 39 Mallard Drive, Slough, Berkshire SL1 5BW
Gair, DJ, 68 North Deeside Road, Bieldside, Aberdeen AB1 9DT
Gandhi, T, PO Box 43630, Nairobi, Kenya
Gaulton, R, 25 Ranulf Croft, Cheylesmore, Coventry, CV3 5FB
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Rigden, NS, 19 Brook Park, Briggswath, Sleights, Whitby, Yorks YO21 1RT
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Stevens, BT, 7 Dalsetter Wynd, Dunrossness, Shetland ZE2 9JQ
Tan, PTS, Apt Block 356, Clementi Avenue, 2 No 10-283, Singapore 0512
Tilton, GF, Chairman, Texaco Ltd, 1 Knightsbridge Green, London SW1X 7QJ
Vaughan, TL, TLV Offshore Services, 111 Maybush Road, Southampton, Hampshire SO1 9PH
Wayne, AS, 63 Higham View, North Weald, Epping, Essex CM16 6DD

The Tony Fox Memorial Award

Harris, MM, 13 Prince Road, Kenfig Hill, Bridgend, Mid Glamorgan CF33 6ED

Students

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Ndi, G, Centre for Petroleum and Mineral Law Studies, University of Dundee, Dundee DD1 4HN

Deliveries into Consumption

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

Products	*Jun 1990†*	*Jun 1991**	*Jan–Jun 1990†*	*Jan–Jun 1991**	*% change*
Naphtha/LDF	213,330	261,620	1,491,990	1,750,130	17.3
ATF—Kerosine	612,340	567,480	3,187,990	2,767,730	−13.2
Motor Spirit	2,026,400	1,925,310	12,085,840	11,733,930	−2.9
of which unleaded	680,650	792,150	3,824,230	4,656,790	21.8
Super unleaded	78,300	94,340	424,490	544,300	28.2
Premium unleaded	602,350	697,810	3,399,740	4,112,490	21.0
Burning Oil	107,910	134,490	1,041,740	1,253,460	20.3
Derv Fuel	904,490	856,320	5,302,440	5,254,860	− 0.9
Gas/Diesel Oil	541,010	539,640	4,138,540	4,243,790	2.5
Fuel Oil	1,313,450	1,010,180	7,098,446	6,034,520	−15.0
Lubricating Oil	68,512	68,170	410,470	395,990	−3.5
Other Products	541,878	537,610	3,267,654	3,082,700	− 5.7
Total above	6,329,320	5,900,820	37,801,750	36,517,110	−3.4
Refinery Consumption	470,300	485,420	2,947,490	2,982,750	1.2
Total all products	6,779,620	6,386,240	40,749,240	39,499,860	−3.1

†Revised *Preliminary

. . . people

Mr Kevin Stovell, above, has been appointed Oil and Gas Director of Ewbank Preece Limited, the international engineering consultancy. Mr Stovell joins Ewbank Preece from EB Global, a subsidiary of ABB.

Lasmo has appointed **Mr John Brading** to its Board of Directors in a non-executive capacity. Mr Brading was Chairman and Chief Executive Officer of Occidental International, based in London, with responsibility for operations in Europe and Africa until his retirement in July 1990.

Mr Paul Butter, above, has been appointed as General Manager of Hobre Instruments (UK) Ltd, a leading supplier of environmental and on-line process monitors, analysers and systems.

Mr Anthony Whyatt has been appointed to the Board of Hardy Oil and Gas plc, as Financial Director. Mr Whyatt was previously Senior Assistant Treasurer of Occidental Petroleum Corporation, Vice President and Treasurer of Occidental Financial Services Inc and a Director of various Occidental subsidiaries including its North Sea operating company.

County NatWest has appointed **Mr Paul Griggs** as Manager in the Corporate Finance Department energy team. He will be involved in developing UK and international mergers and acquisitions business in the energy sector. Mr Griggs joins County NatWest from Petrofina where he was Commercial Manager for the company's UK upstream subsidiary.

Mr Lawson Youde-Owei has been appointed to the newly created post of Head of the Petroleum Analysis Laboratory, by the Petroleum Training Institute, Warri, Nigeria. Mr Youde-Owei was previously principal lecturer in the Petroleum Processing Department of the Institute.

Fluid Data, the on-line process analyser manufacturing group, have announced several new appointments. **Mr Mike Hammond** is appointed Chairman of Fluid Data (UK) Ltd and he will continue in his role as General Manager of Fluid Data-Amscor operations in Texas. **Mr Nick Farrow** is appointed to the position of Managing Director of Fluid Data (UK) Ltd and **Mr John Worrell,** will become the Director of Sales.

Norwegian engineering company, Selantic Industrier, the manufacturer of offshore emergency evacuation systems, has employed two new sales engineers in the United Kingdom — **Mr Phil Dixon** in overall charge of UK sales and **Mr Malcolm Wilson,** Sales Manager to be based in Aberdeen.

The **Reverend Andrew Wylie,** Chaplain to the Oil Industry has recently retired; his successor will be the **Reverend Angus Smith.** Rev Smith was previously Senior Army Chaplain, Scotland.

Sir Lindsay Alexander, Mr Patrick Gillam and **Mr Lewis Preston** will retire from the Board of The British Petroleum Company plc. The Board intends to appoint **Mr John Browne,** above right, and **Mr Russell Seal,** above left, as Managing Directors. Mr Browne and Mr Seal will keep their existing appointments as the Chief Executives of BP Exploration and BP Oil, respectively. BP also intends to appoint **Sir Patrick Wright GCMG** as a non-Executive Director of the company.

Petro Vend, the fuel vending systems company, have appointed **Mr Philip Prow** as UK Sales Manager. **Mr Paul Edge,** Sales Director, is leaving the company to take up the position of Marketing Director of the Drum Engineering Company Limited, part of Syltone plc.

Mr Philip Marsden has been appointed to the Board of Premier Consolidated Oilfields plc as Executive Director in charge of corporate development. Mr Marsden has been an Executive Director of Country NatWest Ltd, a member of the Operating Committee and Head of Mergers and Acquisitions.

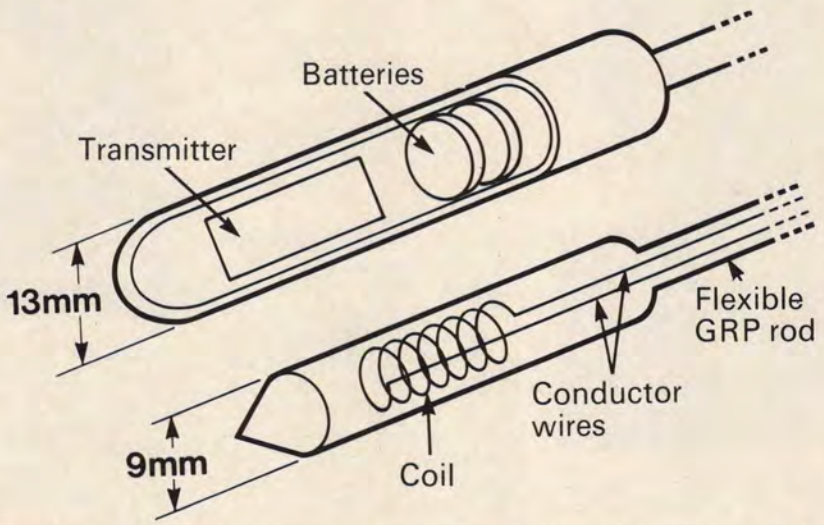
Electromagnetic pipe tracer

Electromagnetic detection specialist Radiodetection Limited is introducing a new means of tracing ½ inch bore plastic pipe, and finding blockages in both plastic and non-magnetic metal pipes. Typical applications include supply pipes carrying water, gas, coolants, fuel and lube or hydraulic oils.

Called 'FlexiTrace', it is a flexible trace rod that will operate over distances of up to 50 metres and at depths down to 2.5 metres, suitable for one-man operation.

In use, FlexiTrace is inserted in the pipe and a tracer signal is applied using any Radiodetection portable signal generator.

Unlike the sondes normally used to trace plastic pipes, which need their own internal power supply and transmitter, FlexiTrace uses an externally generated signal which is fed via internal conductor wires to a small coil at the end of a highly flexible GRP rod.



Flexitrace (Bottom) only has a diameter of 9 mm compared with a typical sonde diameter of 13 mm (Above). This enables Flexitrace to be used in much smaller pipes with bores as small as 10 mm.

Big pumps

Pumpsets to be supplied by Weir Pumps to the Scott field will be the biggest of their type in the North Sea. The pumps contain a number of design features at the leading edge of technology in the UK sector, says Weir.

Three vertical barrel design crude oil export pumps, with 4.2MW motors operating at 3,600rpm, are the largest pumpsets of their type in the UK sector and offer major space and weight savings over conventional horizontal units.

The seawater lift pumps are driven by water filled electric submersible motors which, at 1,130kW from a 6.6kV supply, are the largest in the UK sector.

The three main seawater injection pumps are fitted with oil-lube self-contained bearings and their 7MW direct drive make them among the largest offshore in the North Sea.

Harriet gas

Contract for the construction of the offshore pipeline section of the Harriet gas development has been awarded to McDermott Industries Ltd. Engineering work has commenced and construction work is expected to get underway during November. McDermott will be using its lay barge DB 26 which is now working off West Malaysia.

Halliburton Geophysical Services (HGS) is strengthening its land seismic operations in Africa/Middle East with the delivery of a new generation, heavy vibrator fleet built in Sweden by Volvo.

The five new additions to the HGS fleet, used in seismic exploration for oil and gas prospects, were designed to provide strong, clean and controlled source signals into the earth's geology.

HGS Equipment Manager Steve Dalton said, 'These impressive vehicles combine mobility and weight, allowing us to offer state of the art technology in the most difficult ground conditions.'

Mobil's new isomerisation unit

Mobil is to construct a £70 million light virgin naphtha isomerisation unit at its Coryton refinery near Corringham, Essex.

The new unit — expected to be started by Spring 1992 — will increase the capacity of the refinery to manufacture unleaded petrol by converting low octane feedstock into high octane material which can be blended with other materials to make petrol.

Metalock has introduced a unique nickel alloy (MN211) for use in its cold metalwork method for the repair of castings, in iron, steel and aluminium, which have fractured or cracked at the rig site.

The method — developed in the Texas oilfields in the 1930s — eliminates the need for open flame welding. The new alloy improves the technique because of its higher tensile strength and superior engineering fit to the parent metal.

The repair consists of peening layers of Metalock keys into prepared apertures at right angles and across the line of fracture. The new alloy keys become an almost integral part with the parent metal of the component under repair.

The process dampens and absorbs compression stresses, provides a good 'expansion joint' for castings, distributes the tension load away from fatigue points. Once repaired, components can withstand hydraulic pressures of up to 5,000psi.

Digital pump

Industrial Motor Protection has launched a range of custom designed motor/pump protection devices which prevent the damage caused when underloaded pumps run dry.

In addition the manufacturers claim their patented digital range can act as efficient safety devices on platforms and refineries because the detector can be linked to a fluid level alarm system.

The devices work by sensing the load on the pump motor by measuring the phase angle — a far more effective method for detecting underloads in motors than by the conventional method of measuring current.

Because the devices are more efficient they can prevent serious cavitation problems and detect blocked suction or closed valves.

The heart of the control system is a 40-pin integrated circuit which can be customised to customer requirements. The IC forms part of a low-cost dedicated control unit which has many applications.

Apart from the protection of positive displacement pumps in the petrochemical industry, smaller versions of the range are ideal for preventing damage to borehole and booster pumps.

Subsea valves

A revolutionary range of valves which will substantially reduce the time and expense of retrieval is being launched by Hayward Tyler Fluid Dynamics.

The Luton-based company is launching the Forsac valves at the Offshore Europe exhibition.

Forsac valves have been specifically designed for subsea use and incorporate the latest technology in terms of materials and design for long life and ease of maintenance. They are manufactured in a range of sizes — from 6 inch to 30 inch diameter — and are suitable for all pipelines and flowlines.

The valves feature a unique isolation sleeve which is rotated to block the pipeline before valve retrieval, saving four to eight weeks' lost production in decommissioning, cleaning, driving and recommissioning. The sleeve allows a full local pressure test to be carried out with the valve *in situ*.

Total 'downtime' for retrieving a Forsac valve — from stopping production to depressurise the line until production is restarted — is estimated at two days. During initial trials conducted in a dock at British Gas' research station at Blyth, one diver took 90 minutes to retrieve and replace the core assembly of a 20 inch valve.

Containers

A new range of re-usable transit containers for carrying valuable oilfield equipment by sea or helicopter to platforms offshore has been launched by Skypak.

Whatever the size or complex shape of the equipment, Skypak can custom-design the containers, even for a one-off. Shaped internal polyethylene furnishings provide effective cushioning in the event of the equipment being mishandled during transit.

Micro-detector

Microwaves are being used as a high tech warning system to help reduce potential oil discharges into inland water courses.

Because the new free-floating Microwave Oil Detector from Oil Pollution Environmental Control Ltd can spot oil in water, it also can provide cooling water intake protection for power stations, refineries and desalination plants.

Bioreclamation

Biotreatment has pioneered the application of biotechnology to the reclamation of contaminated soil. Naturally-occurring pollution-eating microbes, grown in the laboratory, are introduced into the excavated soil to neutralise the pollution on site. Similarly, the company can apply bioremediation techniques to the treatment of contaminated water and effluent.

Protective coverall

Safety clothing specialists Angus Workwear are to launch a complete range of Nomex fire-retardant coveralls at the Offshore Europe exhibition.

The coveralls, to be marketed under the name Novaflame 3000, are manufactured to the design and specification of Angus Workwear from the latest Nomex III anti-static fabric, which is inherently flame retardant.

Tough keyboards

The Storm sealed keyboard with IBM PC/XT/AT, PS/2, RS232 and RS423 interfaces is available from SD-Scicon. Designed for use in areas where dust, dirt and water would damage a standard keyboard, the Storm unit is metal cased and completely sealed. This makes it suitable for use by unskilled operators and those wearing gloves.

UIE Scotland Ltd completed one of the fastest construction projects ever assembled for the UK offshore industry when the 2,000 tonne Anglia 'A' gas production platform sailed out of the firm's Clydebank yard.

It took just 14 months — from the start of the conceptual design to platform completion — for UIE to finish the contract for Ranger Oil.

The successful completion and full commission of the complete jacket, piles and topside deck for the Anglia gas field in the southern North Sea means UIE have maintained their on-time delivery record for the past six years.

Ranger Oil's Venture Project Manager John Lane said: 'We are delighted with the quality and the on-time delivery of the platform.'

Shockless nozzle design

A revolutionary design of fire fighting nozzle recently developed by Haisley Firetech Ltd of Chorley has several novel features which are ideal for use offshore especially for inexperienced staff.

These have been achieved by experienced nozzle designer, John Haisley, through a special design of internal galleries without loss of benefit regarding flow and pressure.

The shockless feature, by which the nozzle will not shut nor open in jet mode, makes it ideal for use by inexperienced personnel. The surprise effect on non-dedicated fire fighters from the sudden jet shock reaction force from conventional nozzles can be very disconcerting and positively dangerous, particularly when fire main pressures exceed 7 bar g.

The nozzle is operated by rotation of the control collar. In operational mode the valve is designed to provide first a wide flat spray which the operator can then adjust to a powerful narrow spray as required.

'State of the art' patent titration

Aquapal Ltd has come up with a 'state-of-the-art' coulometric titrator which does away with the need for regular calibration during the determination of water content in crude oil.

Regular calibration is normally needed because the standard methods of coulometric Karl Fischer titrations — like IP method 386 — required that the titration cell's anode solution should be modified by xylene.

Unfortunately this increased the electrical resistance of the solution (as did the addition of the crude oil samples) to such an extent that instruments were unable to operate 100 percent efficiency and tended to give falsely high results.

The Aquapal 'III' overcomes these problems by a patent current monitoring technique which automatically selects lower titration currents to ensure that the correct water content result is provided.

In addition, the Aquapal 'III' is capable of measuring down to 1 microgram and requires only minimal experience to use.

Purge air system

A purge air system with quick release connections has been developed by SAS Limited to improve the operational safety of platform survival craft in an offshore emergency situation.

This SAS system is designed to provide a flow of purge air into the survival craft and out through the sliding door entrance, preventing hazardous gases and smoke entering the craft while it is being boarded in an emergency evacuation.

Success by design

Engineer Richard Tomlinson has reached the regional semi-finals of the national Toshiba Year of Invention competition, organised by the Confederation of British Industry, for designing a gauge for measuring cracks in offshore installations beneath the sea.

The linear-angular measurement gauge will enable deep sea divers for the first time to take accurate measurements of the angle and depth of cracks in North Sea oil and gas rigs.

Mr Tomlinson, who is himself an experienced diver, claims there is nothing comparable with his gauge on the market. 'Divers at present use schoolboy plastic rulers and protractors to do the job, resulting in alarming inaccuracy', he said.

The time spent by divers underwater checking the safety of oil rigs is very expensive and any device which makes their job easier can only be economically beneficial. Accurate measurements of cracks discovered on structural members under the sea is essential before engineers can analyse stress patterns and recommend remedial repairs.

Contact list

Radiodetection Ltd **0272 767776**
The Weir Group plc **041 637 7111**
Halliburton Geophysical **0234 273820**
Mobil **071 828 9777**
Metalock **081 311 4040**
Industrial Motor Protection **0509 239200**
Hayward Tyler Fluid Dynamics **0582 31144**
Skypak containers **0703 789468**
OPEC Ltd **0924 442701**
Biotreatment **0222 747414**
Angus Workwear **0224 582288**
SD-Scicon UK Ltd **061 491 3683**
UIE Scotland Ltd **041 952 2040**
Haisley Firetech Ltd **061 745 7767**
Aquapal Ltd **0525 61014**
SAS Ltd **0942 724248**
Toshiba **071 828 8066**

The Associated Octel Company is one of the country's leading Chemical Companies - a success story that goes back over 50 years. Today we have a turnover in excess of £200 million and are one of the UK's top 75 exporters. We owe our success to the continuous development of our products and more recently to diversification into new product areas.

MANAGER FUELS TECHNOLOGY

Our Engine Laboratory, based near Milton Keynes in Buckinghamshire, is world-renowned. It is one of the few establishments in Europe that has special expertise in fuel technology, vehicle testing and engine development.

One of the key groups reporting to the Manager, Engine Laboratory, is the Fuels Technology Group.

We currently aim to fill the senior position within this group - Manager, Fuels Technology.

The person appointed will be responsible for co-ordinating the technical service support and product development work associated with the growing range of Fuel Additives offered by the Octel Group. The position will involve significant interaction with other company departments such as Sales & Marketing and Business Development. The major objective being development of new markets and identification of research opportunities in fuels and fuel additives.

The ideal candidate will have a good honours degree in either Chemistry or Chemical Engineering followed by at least ten years relevant experience in the Refining and/or Fuel Additives Industry. This experience must have led to a demonstrable business awareness of the market place within which the job holder will operate, as well as the ability to liaise professionally at all levels both in and outside the Company.

There will be travel in the United Kingdom and overseas when necessary.

We offer an excellent salary and benefits package including BUPA and contributory Pension Scheme together with relocation expenses where applicable.

Please write enclosing a comprehensive cv to Mr. M. Mathieson, Manager, Staff Relations, The Associated Octel Company Limited, PO Box 17, Oil Sites Road, Ellesmere Port, South Wirral L65 4HF.

THE ASSOCIATED OCTEL COMPANY LIMITED

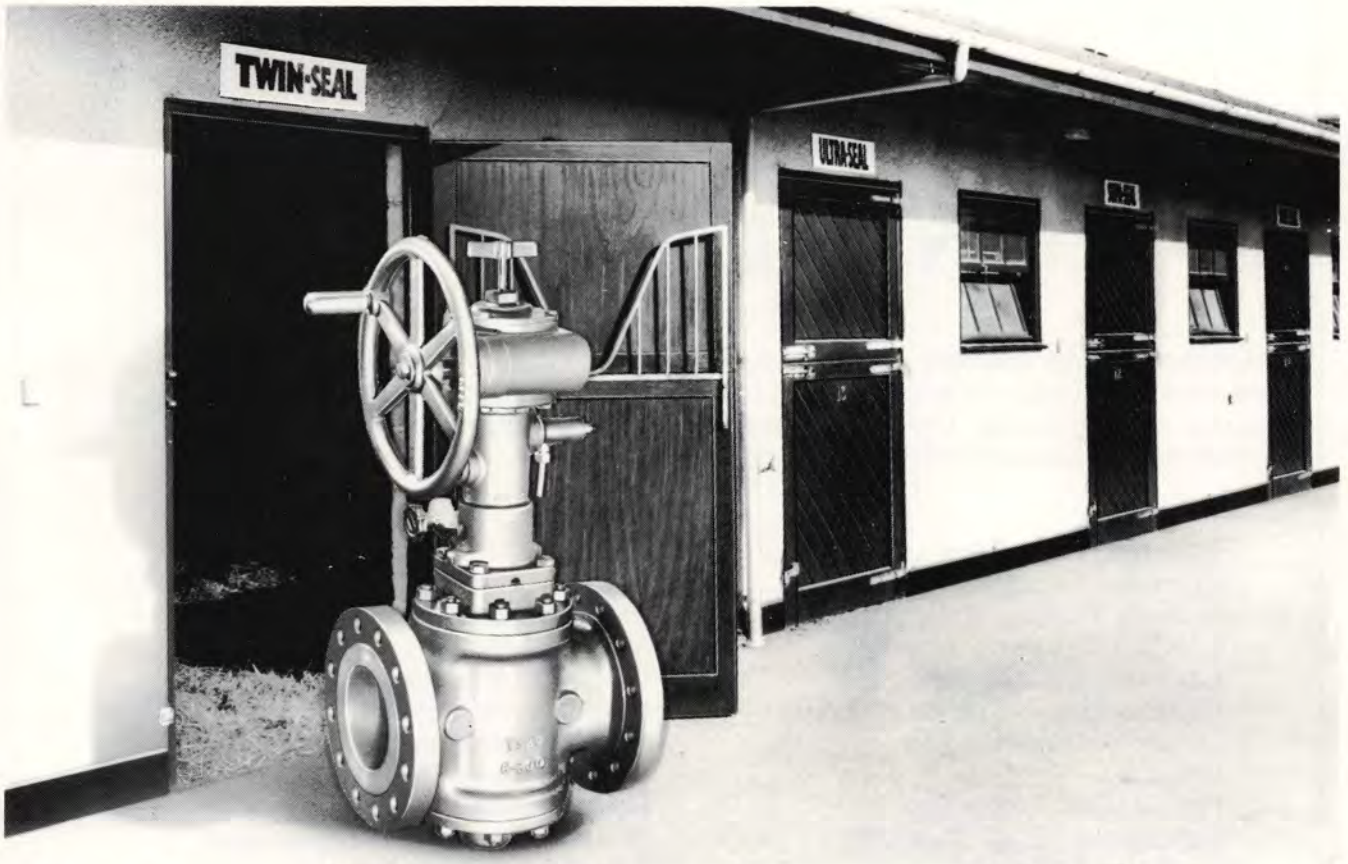
PERSONNEL, EDUCATION AND TRAINING DISCUSSION GROUP

The next meeting of the Personnel, Education and Training Discussion Group will be held at the Institute of Petroleum on **Wednesday, 25 September 1991** starting at 5.30 pm. (Tea and biscuits will be available from 5.00 pm.)

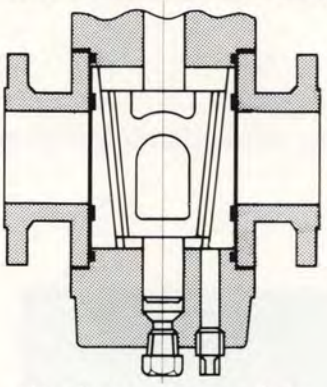
The Ford Motor Company Employee Development and Assistance Programme — a personal training contract concept expressed in cash terms

Speaker: **Mr K Mortimer,** Manager, Education and Training and EDAP, Ford Motor Company Ltd.

If you would like to attend this meeting please contact **Mr AE Lodge,** Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR. Telephone 071-636 1004 Ext 236.



A Double Block and Bleed Thoroughbred from a Famous Stable



Ultra-Seal ball valves, Sure-Seal butterfly valves, Supa-Seal high pressure ball valves are all high quality products from the Hindle Cockburns stable.

Now comes the thoroughbred double block and bleed valve – the General Twin-Seal plug valve. Following the acquisition of General Valve (UK) Ltd, Hindle Cockburns are now licensed to manufacture and market the Twin-Seal and other General Valve products in Europe, Africa and the Middle East.

The Twin-Seal is a non-lubricated plug valve, that maintains its very high level of upstream and downstream sealing by eliminating seat wear during rotation of the valve. The seals retract prior to cycling ensuring that there is no rubbing during the opening or closing operation.

The General Twin-Seal has become the industry standard throughout the world for Double Block and Bleed performance because of the 'bubble-tight' integrity of its sealing system.

For further details contact:-

HINDLE COCKBURNS

Victoria Road, Leeds, LS11 5UG.
Tel (0532) 443741. Telex: 55257.

TWIN·SEAL

The Ultimate Double Block and Bleed Valve

CONSULTANT LIST

Members of the Institute of Petroleum offer consultancy services in a wide range of petroleum industry subjects. A list of consultants in any category will be provided free of charge on application. Currently about 300 members offer 44 different categories within which we can identify other areas of expertise.

Additives Technology
Corrosion Technology
Custody Transfer Arrangements
Energy Efficiency
Environment – General
Environment — Marine Pollution
Expert Witness Services
Finance
Fuels & Fuel Technology
Government & EC Relations
Health and Hygiene
Industrial Relations
Information Technology
Laboratory & Test Method Advice
Legal Advice
Loss Prevention
Loss Prevention – Marine
Lubricant Technology
Maintenance & Inspection
Management Organisation
Marine Operations
Market Research & Analysis
Marketing – General
Marketing – Operations
Measurement & Fluid Flow
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Pipeline Planning & Management
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(Requests for lists of more than two categories may involve an administrative charge)

Anyone interested in obtaining this list should contact
Jo Howard-Buxton at the IP. Tel: 071 636 1004