PETROLEUM REVIEW

IP THE INSTITUTE OF PETROLEUM

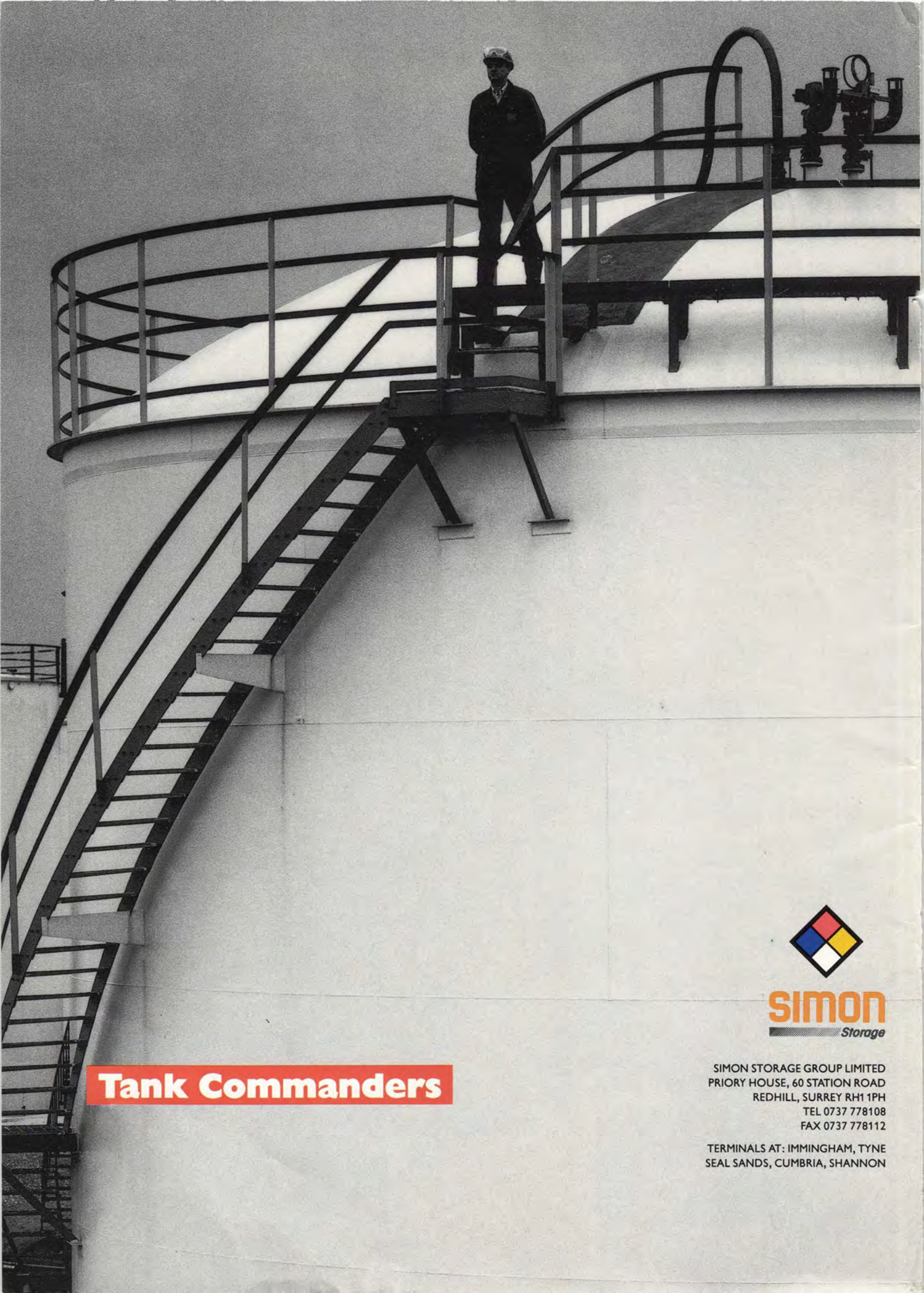
December 1994

Russia
Oil spill accents enormity of environmental risks

Additives
More and more detergents go into UK motor gasoline

Distribution
Update on UK road and rail options

Brazil
The hydrocarbon potential of the Amazon rain forest



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PETROLEUM REVIEW

DECEMBER 1994 VOLUME 48 NUMBER 575 • £8.00 • SUBSCRIPTIONS (INLAND) £85.00 (OVERSEAS) £100.00

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Published Monthly by
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A charitable company limited by guarantee

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IP THE INSTITUTE OF PETROLEUM

For details of membership, including Petroleum Review at no extra cost, please apply to the Membership Department.

Printed by Eyre & Spottiswoode Ltd, London and Margate.

US MAIL: Petroleum Review (ISSN 0020-3076 USPS 006997) is published monthly for US$165 per year. Second class postage paid at Middlesex, New Jersey.
Postmaster: send address changes to C&C Mailers International, PO Box 177, Middlesex, New Jersey 08846, USA.

ABC BUSINESS PRESS ISSN 0020-3076 MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS

CONTENTS

COVER PHOTO
Usinsk oil spill in the Tomi Republic.
Photo by KATZ Pictures

NEWS IN BRIEF

23 October
The US navy boarded a Russian-built tanker in the Gulf on suspicion of illegally exporting Iraqi oil. The Honduran-flagged *Al Mahrousa,* which was diverted to Kuwait for further investigation, is the second vessel to be intercepted for possible sanction-busting in less than a month.

24 October
Powell Duffryn has expanded its fuel distribution activities with the purchase of MB Gas, the UK downstream LPG distribution arm of Elf Antargaz.

The Trustee Savings Bank has sold 110,000 shares in Shell Transport in protest at Shell's environmental and social policies in Nigeria.

25 October
Brown & Root and McDermott have begun talks over merging their struggling Scottish yards. A 50/50 joint venture, combining McDermott's Ardersier yard with the Nigg yard, would create one of the UK's largest fabricators.

30 October
Statoil plans to shut down its Statfjord A platform in 2003 in the hope of averting an early closure of the entire North Sea field by 2007. The company hopes this measure will allow the other two platforms to continue in operation until 2009.

31 October
Natural gas exports from Algeria to Italy are set to double by 1997, following a partnership agreement between Sonatrach and ENI.

31 October
A Russian fish factory ship, the *Pionersk,* ran aground and broke up off the Shetland Islands with 570 tonnes of oil on board.

Alliance Gas has bought gas worth more than £150m from the Brae, Beinn and East Sean fields in the North Sea.

1 November
Russia has suspended shipments of oil to Cuba after Havana failed to supply Moscow with sugar. The breakdown in the exchange agreement poses a serious blow to the Cuban economy and follows a series of sugar harvest failures.

BP announced a 23 percent rise in third-quarter profits, from £339m last year to £415m. Chief Executive David Simon said this was the company's best quarter since the middle of the Gulf War in 1991.

2 November
As many as 500 people were killed in southern Egypt when lightning struck a fuel depot, flooding the village of Dronka with blazing oil. The oil came from three storage tanks, containing 5,000 tons of fuel, which exploded during devastating storms.

New proposals on exploiting the UK's existing offshore infrastructure in order to cut costs have been launched by Industry and Energy Minister, Tim Eggar.

Russia may impose economic sanctions on Azerbaijan if Baku refuses to back down from its $8bn agreement with the west to exploit offshore oil reserves in the Caspian Sea. The suggestion was made in a letter from Russian Foreign Minister, Andrei Kozyrev, to his Prime Minister, Viktor Chernomyrdin, which was leaked to *The Independent.*

North Star Shipping has clinched an £80m North Sea contract to provide standby vessels for Shell UK. The 10-year contract covers six dedicated vessels and three relief ships.

SLP Engineering has completed the £70m jacket for Elf Enterprises's Claymore accommodation platform seven months ahead of schedule.

A Marathon-led consortium has discovered gas in St George's Channel, 24 miles off the coast of Wales and 26 miles off the coast of Ireland.

3 November
Elf Aquitaine sold a 10 percent share in Enterprise Oil for about £185m at a substantial discount to the market price. The move follows Elf's decision earlier this year to re-classify the holding as non-core.

4 November
Amoco has chosen the Jurong shipyard to convert an existing tanker into a FPSO vessel for the Liuhua 11-1 development project in the South China Sea.

Drilling has started on the Papua New Guinea Menga-1 project, according to Victoria Petroleum.

6 November
Greenpeace has reported a second rupture in the corroded pipeline running through Arctic Russia which leaked up to 270,000 tonnes of oil in October. Environmentalists claim this latest leak has resulted in a further spill of 13,000 tonnes.

7 November
Kvaerner has clinched two contracts worth NKr 630m for Statoil's Norne oil field development. The orders involve the delivery of a 2,500-tonne prefabricated compressor module and two gas turbine generator packages.

The UK government has given BP and Shell the official go-ahead to start first phase development of the Foinaven field. The £550m project will offer £90m worth of contracts.

8 November
Kerr-McGee has been given the go-ahead by the Chinese government to begin exploration in Bohai Bay.

Electricity regulator Stephen Littlechild has urged the government to choose only the cheapest 'green' power projects in its latest round of subsidies for renewable energy. This would move the emphasis away from hydro and waste burning schemes towards wind and landfill gas.

Phillips announced that its North Sea Judy/Joanne development is due to come on stream three months ahead of schedule at the end of 1995.

Trafalgar House Offshore Services has been awarded an innovative engineering services contract on BP's Harding development. The award, believed to be the first of its kind, includes operations and maintenance support.

9 November
British Gas has announced the inauguration of the Zaafarana field in the north central Gulf of Suez.

10 November
British Gas and First Philippine Holdings Corporation have signed a joint venture agreement to develop natural gas projects in the Philippines. The projects are aimed at developing a downstream market for Shell/Occidental's major Malampaya-Camago offshore gas discovery.

Brazilian oil workers withdrew their threat to renew earlier strike action after winning concessions from the government.

11 November
The Ekofisk II redevelopment project has been formally approved by the Norwegian Storting.

12 November
Iran has acquired a five percent stake in the $8bn Caspian oil project from SOCAR, according to the *Islamic Republic News Agency.* Under the agreement, which was signed in Baku, a quarter of Azerbaijan's 20 percent stake will transfer to the National Iranian Oil Co in return for financial and technical assistance. Iran is expected to invest between $300m and $350m in the venture.

13 November
A 'minor release of gas' took place on BP's Thistle platform in the East Shetland Basin. The incident was over within an hour.

14 November
AMEC has won a $100m contract from the Cabinda Gulf Oil Company to design, supply and construct two Angolan oil platforms.

Shell is to buy a 50 percent stake in Monteshell from the Ferruzzi group. The 2,200-strong network of service stations has seven percent of the Italian vehicle-fuel market.

Amoco has begun drilling for coalbed methane gas in Poland's Silesian region, which is estimated to have reserves of between 400bn and 600bn cu m.

15 November
The Azerbaijan Parliament has officially ratified last September's historic Caspian Sea contract between SOCAR and a consortium of Western oil companies.

Foreign tankers hit by new US pollution rules

US-based shipowners are set to reap considerable benefit from America's latest attempt to protect its shores from pollution.

By 28 December, every tanker trading in US waters must obtain a new Certificate of Financial Responsibility (COFR) from the US Coast Guard in order to comply with the Oil Pollution Act of 1990.

This latest requirement will pose few problems for the oil majors, the larger US-based independent shipping companies and the various government-backed fleets, according to a new report from *Lloyd's Shipping Economist (LSE)*.

Mobil, for example, has already obtained COFRs by establishing a separate guaranty company and most other US oil majors are believed to have similar plans afoot.

The foreign, independent tanker owners, however, will find it far more difficult to comply with this latest environmental requirement.

'Few others will be able to emulate the US-based companies,' says the new report. 'Mobil's route is restricted to the large, financially-sound few.

'Most will have problems finding a financial guarantor who is both willing to accede to direct action in the event of a pollution damage claim and who is acceptable to the Coast Guard.'

The only real option for the foreign independents, who carry about 70 percent of US crude imports, will be to approach either OPAclub, Firstline or Shoreline. All three organisations have been set up to provide the financial guarantees required to obtain a COFR from the Coast Guard. However, all three approaches are new and untried, according to the report.

'The cost of moving oil to the United States is going to rise no matter what', says the report, 'but if the new schemes are not successful by Christmas, cost will be the least of the (foreign tankers') worries.'.

Whatever the solution for the rest of the world's tankers, US-based owners are set to benefit by having the cheapest certificates, concludes the report.

The cost of moving oil to the United States is set to rise

'Rotterdam still world's number one'

Claims by Singapore that it is now the largest port in the world are based upon misrepresentative statistics, according to Rotterdam.

Rotterdam, which believes it will continue to be the largest port for many years to come, alleges that at the end of 1993 Singapore mistakenly compared freight tons at its own port with metric tonnes in Rotterdam. On this basis, it then claimed that Singapore was about to take over the number one spot.

'A new study carried out by the Rotterdam Municipal Port Management (RMPM) shows that Singapore did not handle 273.7 million tonnes of cargo in 1993 as claimed, but around 205 million tonnes,' said a spokesman for Rotterdam port. This altered figure poses little threat to Rotterdam's 1993 total of 282.2 million tonnes.

Some of the Japanese ports also use the freight ton as the measurement unit for their cargo transhipment.

'Everybody took the figures for granted at the time,' said Mr Frank van Rhee, Commercial Director at RMPM. 'But actually comparing the throughput in the major world ports is like comparing apples with pears.'

Rotterdam is now calling for better harmonisation of transhipment figures between ports.

Where did you get that consultant?

British oil companies are being urged to swap information on good consultants in order to further the CRINE initiative.

A register of consultants who deliver training programmes in areas such as strategic change, team development, and interpersonal skills is currently being compiled by the CRINE Education and Training Group.

The register will only list trainers who have been recommended by people within the industry and whose programmes encourage positive cost-cutting exercises.

'In the spirit of the Cost Reduction Initiative for the New Era, we ask you to share contact details of your successful consultants,' said Ms Stella Littlewood, who chairs the Group.

Elf wins DMM pipeline rights

A consortium led by Elf has won operating rights to the Donges-Melun-Metz pipeline, which traverses France from west to east, covering a distance of 630km.

The French state-owned pipeline was previously used by the US army to transport fuel supplies in both France and Germany.

Elf has three partners in the consortium: petroleum products distributor Bollore Energie, the shipping group Compagnie Nationale de Navigation and the Port of Nantes St Nazaire.

The consortium beat off a rival bid from Trapil, which operates the Basse-Seine pipeline.

New gas launch

Cut-throat competition in the industrial and commercial UK gas market has led to unsustainable price wars, according to Simon Kirk, head of British Gas's contract arm.

Mr Kirk was speaking at the relaunch of his division, which has been renamed 'Business Gas' and will operate with 400 fewer employees.

India moves towards national gas grid

A significant step has been taken towards an Indian national gas grid. Four modern states – Andhra Pradesh, Karnataka, Kerala and Tamil Nadu – have called for a three-month feasibility study for a pipeline to serve their area.

Originally, the south hoped to build a pipeline from the prolific gas fields in the western offshore area and in 1990 a committee was set up to examine the scheme's feasibility. In 1992 the experts concluded that unless about 350 million cubic feet a day of surplus gas became available it would not be viable. No decision on a line that could cost $750 million should be taken on the basis of indicated reserves.

Just over a year ago, central government signalled a change of mind. Satish Sharma, Minister of Petroleum and Natural Gas, told parliament that the desired grid could be ready by about 1996-97. Two key factors appeared to have prompted the change of heart.

First, with liberalisation it was clear that foreign funds might aid the grid's formation. Secondly, a number of proposals were on the table for imported gas, and part of this could be diverted south.

The state Oil and Natural Gas Commission first proposed a national grid in the mid-1980s but politicians were sceptical. Several years ago, when the grid was being examined again, it was reckoned that it would take a decade to finish and could cost $6 billion.

That such a big gas project might be accomplished has been indicated by the 1,950 km Hazira-Bijaipur-Jagdishpur artery, which went on stream in 1987 to move gas from western waters to fertiliser and power plants in northern India. The Gas Authority of India later made plans to upgrade it and has other more modest lines in hand.

In the south it is hoped that piped gas imports will supply needs there. Turkmenistan, Iran and Oman have all expressed interest in supplying India with gas. For the south, the best option seems to be Oman, which could have a pipeline on-stream by the end of the decade.

Indians set to use more gas

French supermarket growth tailing off

New retail figures reveal that French supermarkets now account for almost 40 percent of the country's service station network but fears that they may be taking over the entire petrol market are fading.

The number of supermarket service stations increased by only 4.3 percent in 1993 bringing the total to just over 4,000, according to statistics released by the French Petroleum Products Directorate. This easing up in the growth rate of supermarket stations has now been a feature for several years.

Their actual share of the market rose by almost seven percent last year. In contrast, the oil companies' share dropped by nearly five percent to 44 percent and the independently-owned companies dropped by nearly six percent to just 3.3 percent of the market.

Overall, the national network decreased by nearly eight percent last year to 20,000. This compares to a similar fall of 8.4 percent in 1992 and the report forecasts that this current rate of decline is likely to continue for years to come.

The scaling down of the network is largely attributed to 'savage competition amongst French operators which has resulted in margins significantly lower than in other European countries'.

Total came out as the number one service station operator, with a network of 3,470, followed by Elf (1,751) and then Shell (1,455).

All in all, the oil companies' ownership networks totalled 4,179 in 1993 – a fall of five percent on 1992 – while their franchise networks extended slightly to 5,659. At the same time, the number of independent stations fell by a massive 30 percent during last year, to 3,360.

One of the major effects of rationalisation has been a strong year-on-year rise in the productivity of service stations. Average monthly throughput per outlet in 1993 was up 9.2 percent on 1992 at 166 cubic metres. The report compares this figure with 234 cubic metres per outlet for Germany, 166 for the United Kingdom and 92 for Italy.

Fortune completes Chinese terminal

Fortune Oil has pronounced its first ever joint venture with China a success.

The venture, between Fortune and the Maoming Refinery in the booming southern province of Guangdong, involved the construction of a new Single Point Mooring buoy facility.

The facility, which was completed on schedule and came under budget at $23.5 million, will handle the bulk of the Maoming refinery's imported crude oil requirements.

It was constructed to remove a major supply bottleneck and will enable the refinery to substantially increase its current capacity of 8.5 million tonnes per annum.

Bitor breaks into Denmark

Bitor Europe has clinched its first ever contract on mainland Europe with an agreement to supply *Orimulsion* to a Danish power station.

Some 100,000 tonnes of the Venezuelan fuel will be delivered to the modern Asnaes power station this month. If initial operations are satisfactory, a further 1 million tonnes will be supplied next year.

SK Power, the generating company behind the deal, will then have the option of ordering up to another 1 million tonnes during 1996. However, the hope is that a long-term contract will be negotiated before then.

The power station's generating unit No.5 is equipped with low NOx burners, electrostatic precipitators and a flue gas desulphurisation plant.

Bitor already supplies two British power stations. It hopes to be able to announce details of a second contract on the European mainland in the near future.

'Saddam Hussein's days are numbered'

UN sanctions look set to topple Saddam Hussein from power, according to a leading UK economist, allowing Iraqi oil back on the world market as early as mid-1995.

Iraq's recent recognition of Kuwait is further evidence that the country's economy is close to collapse, Dr Leo Drollas, Deputy Director at the Centre for Global Energy Studies, told *Petroleum Review*. 'But at the same time, America is not going to allow sanctions to be lifted as long as Hussein is still in power', he said. 'Therefore, Saddam's days are numbered. '

Dr Drollas identified one other possible outcome, however, which could both save Iraq's economy and allow Saddam Hussein to remain in power.

'The United States has unilaterally withdrawn from the Bosnian embargo. What if Russia were to take the same attitude over Iraq and refuse to take part in the embargo?'

Either way, he said, Iraqi oil will flow sooner rather than later and possibly as early as mid-1995.

Now that Iraq has recognised the Kuwaiti border, it is actually not far from complying with the key terms of UN Resolution 687, which concerns the lifting of sanctions. However, both the United States and Britain are insisting on full Iraqi compliance with all the other UN resolutions before the embargo is lifted. Even France, which until recently had shown some sympathy for Iraq's plight, now insists on full compliance.

According to Dr Drollas, it will be very difficult for Saddam Hussein to meet some of these other demands.

One of the requirements is that all weapons of mass destruction be destroyed. This is a key stumbling-block: the commission responsible for monitoring Iraqi compliance with the resolutions submitted a report only last month expressing concern over the issue.

Two other resolutions that are likely to prove major sticking-points are the requirement for Iraq to end the repression of its own people and the insistence that Iraq returns all POWs and detainees. Of the 780 mostly Kuwaitees that the United States insists have been missing in Iraq since the Gulf War, only around 40 have been returned.

Upturn in UK offshore drilling forecast

Whilst drilling activity on the UK Continental Shelf (UKCS) could at last be on the upturn, Norway continues to 'choke' any chance of a recovery in exploration with its tougher tax laws.

In its North West Europe Third Quarter Review, Arthur Andersen predicts that as many as 100 wells could be drilled next year on the UKCS. This would end a steady decline in activity that has already lasted four years.

Much of the extra activity will take place West of Shetland, according to the report. However, the fact that many 3-D seismic surveys have been completed this year will also encourage exploration.

In addition, plans to build an Interconnector between Britain and Europe will help boost the search for gas in British waters.

Norway, on the other hand, appears to be 'choking exploration expenditure', according to Arthur Andersen.

'In contrast to the increasing optimism evident in the UK drilling scene, Norwegian exploration is suffering.' At the close of the third quarter, activity levels had dropped over 30 percent compared with the same point in 1993.

Norway is failing to replace its hydro-carbon reserves, says the report, despite the fact that its Continental Shelf may well contain reserves as large as some of the finds that characterised the area back in the 1970s.

Operators are now looking to explore deep -water areas such as the Voring Basin in an attempt to find larger accumulations that could be exploited at a more profitable rate.

Norway could perhaps learn a lesson from the Netherlands, where the government is expected to implement tax reforms before the next round of offshore licensing begins next year. Arthur Andersen predicts that this could result in an increase in Dutch drilling in 1996 for the first time in five years.

Mobil establishes Dutch gas base

Mobil Corporation has edged further into the European natural gas market with the establishment of a new group in The Netherlands.

MEGAS, which stands for Mobil European Gas, has been set up to develop new markets and customers in Europe, as well as to co-ordinate the company's natural gas business right across the region.

'We see natural gas as a major growth opportunity in Europe,' said Chairman and Chief Executive of Mobil Corporation, Lucio A Noto. 'Mobil is a major player in the global gas business from North America to the Far East. We now intend to build on our experience and expertise to become competitive with the major established players in Europe.'

Mr Ted Trafford, who formerly headed up Mobil Gas Marketing in Britain, has been appointed General Manager of the new organisation.

Mr Ted Trafford

BP settles Alaskan tax dispute

BP has reached a $1.4 billion settlement agreement with the State of Alaska over a long-running tax dispute.

The agreement ends years of argument over oil and gas production taxes and income taxes dating back to the late 1970s and 1980s.

Alaskan Governor, Walter Hickel, said the settlement laid the foundations for a new era of better relations between the two parties.

New marine firm targets Far East

A new oceanography company has been formed to target the growing need for environmental expertise in the Pacific.

Wimpey Environmental has teamed up with Fugro to form a new joint venture company which is set to become one of the world's largest suppliers of environmental assessment and protection at sea.

Global Environmental and Ocean Sciences (GEOS) will concentrate initially on the growing market in Australasia and the Pacific Rim and will combine Wimpey's Singapore-based business with Fugro's offices in New Zealand.

'Today some 95 percent of all petrol sold in the United Kingdom contains detergent additives'

By Dr Cathryn Hickey, Technical Manager for Automotive Fuels, Shell UK Ltd

During the past 18 months, we have witnessed a dramatic uptake in the use of detergent additives in petrols in the United Kingdom. In 1993 less than 40 percent of all petrol sold in the United Kingdom contained detergents, whereas today, approximately 95 percent does. What has brought about this transformation?

I would like to offer some answers to that question, and to show something of what makes a good detergent additive. In a marketplace where nearly all petrol retailers now say they use fuel detergents, only some know how to formulate them, or even how to add them correctly to fuels to obtain the performance and environmental benefits which the best detergent additives undoubtedly offer.

Development of detergents

At a quick glance, you could be forgiven for thinking that detergents are a recent innovation. Yet nothing could be further from the truth. Fuel detergents were first used by Shell in the United Kingdom more than 40 years ago. Since then, they have been continuously developed by several leading oil and chemical companies to provide state-of-the-art chemical innovation, capable of delivering demonstrable benefits to the customer.

Despite this intense activity behind the scenes, however, most other fuel retailers have not added detergents until very recently. Before I consider why, let me look at what these additives are and the function they perform in an engine.

Detergents are now an integral part of today's quality fuels. Working together with a carefully-formulated base fuel composition, they can make a measurable contribution to the efficiency, dependability and longevity of petrol and diesel engines.

The detergents are normally injected into the base fuel as it is being loaded into a tanker at the distribution terminal. That way, each individual oil company can choose whether or not to use an additive and, if so, which additive chemistry to adopt. As such, detergents are brand specific additives.

The beauty of the chemistry is that, although only relatively small quantities of the detergents are used, as part of a specifically formulated additive package they deliver very considerable effects on the engine performance – even when used in the parts per million range.

Detergent additives have come a long way since their development and commercial introduction in the 1950s to solve carburettor gumming problems, after vehicles engaged in stop and go service were found to be developing symptoms of rough idling, requiring frequent adjustment of the air/petrol mixture.

Technologists found that the use of low molecular weight surface active molecules, containing a polar head and one or more hydrocarbon tails in the petrol would keep the carburettor surfaces clean and free from deposits.

The polar head generally contains oxygen or nitrogen atoms which are attracted to the metal surfaces in the carburettor, while the hydrocarbon tail projects into the fuel. A protective film then forms on the surface, which reduces the accumulation of carbon deposits.

Since these early days, engine technology has come on in leaps and bounds - not just in response to tighter emissions legislation but also to the ever higher performance levels demanded by the motorists. In turn, the formulation of detergent packages has had to develop in order to keep pace with the changing engine technology – something which has come about thanks to a long and highly productive collaboration between the oil and motor industries.

Large carburetted engines have been replaced by smaller efficient designs incorporating fuel injection technology. In addition, the critical engine parameters are monitored and controlled by complex electronic engine management systems. With these sophisticated power plants, vehicle performance can be very impressive – excellent acceleration performance and power coupled with good fuel economy and low exhaust emissions.

Carbon deposit formation

However, on-the-road experience showed that even such state-of-the-art control systems are not able to compensate for everything. It became apparent that many modern engines were sensitive to carbon deposit formation.

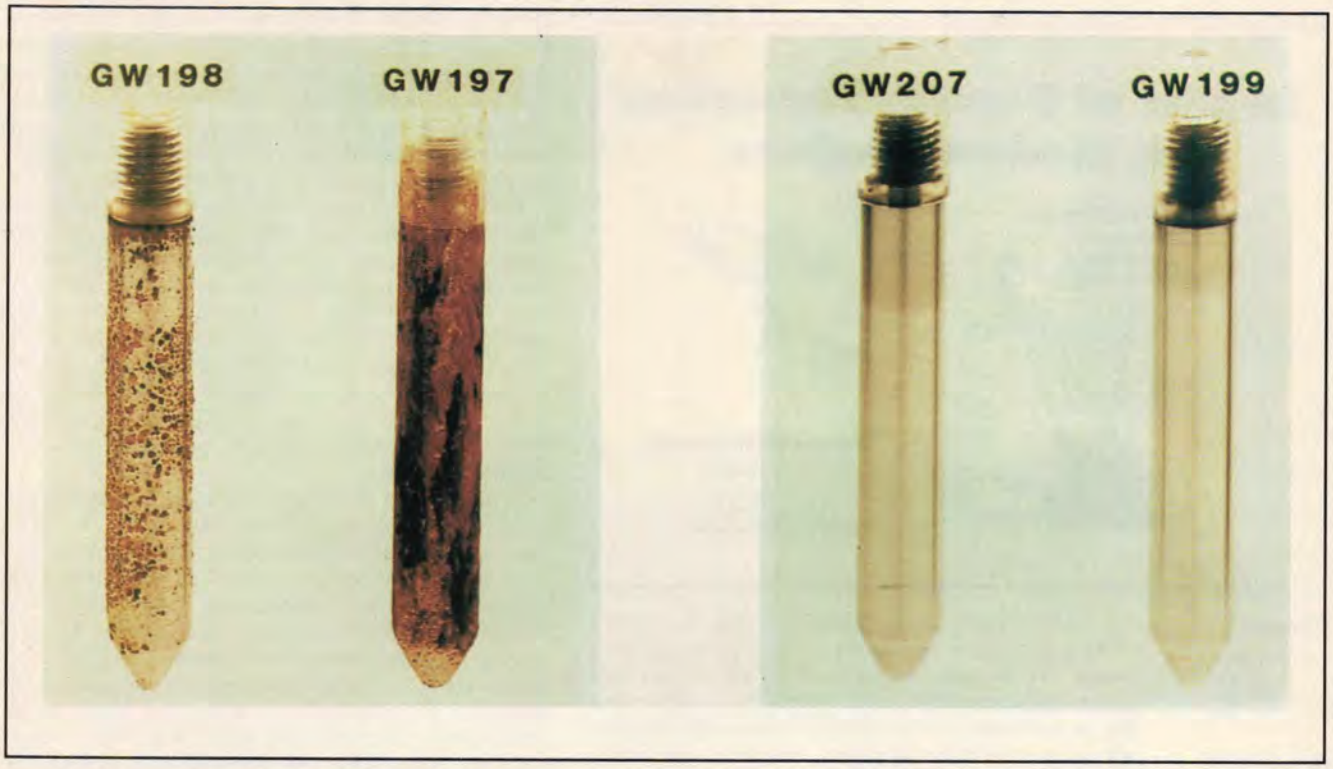
If the extremely precise metering openings of the electronic fuel injectors become restricted, performance can be immediately impaired, with a reduction in power output and fuel economy and increased carbon monoxide and hydrocarbon emissions.

One of the first attempts to solve the fuel injector fouling problems involved an increase in the level of carburettor detergents in the petrol. This did indeed clean up the fouled injectors but at the same time led to higher levels of deposit accumulating on the inlet valves.

Unfortunately, the use of detergents in petrol is not as simple as adding soap to water. The additive package, including the detergent, needs to be sensitively formulated to take account of the environment in which it will be operating, including extremes of temperature and the lack of a washing solvent, so that the surface active detergent molecules can still function to clean and protect the metallic surfaces.

The engine environment has changed and will continue to do so, with future technical developments and legislative requirements. Such variations need to be built into the extensive research and development of a suitable package. Only then will the required cleanliness and performance

Left: Heavily corroded metal probes which have been in contact with petrol lacking the new Shell detergent. Right: Nearly spotless probes which have been in contact with New Improved Shell Advanced Petrol for an equal amount of time.



benefits be assured, without potential side effects.

There is simply no such thing as an 'off-the-peg' state-of-the-art detergent that can give the motorist the same performance benefits without any side effects as technology which has been designed and improved over many years. The Shell Thornton Research Centre, for example, has been working on this area for half a century - ever since its pioneering early work in wartime aero engine research, when scientists solved fouling problems with the spark plugs of World War II aircraft. Thornton has installed some score of different bench engines through which it puts different fuels, to evaluate their effect and performance with different engine technologies.

Deposit control additives

Petrol detergent additive technology has passed through several generations before it arrived at the highly effective molecules typically used by leading oil companies today, such as Shell. The packages are more powerful than the carburettor detergents and are often known as deposit control additives, keeping the engine clean and cleaning up any deposits to ensure total engine cleanliness.

The latest additive packages contain molecules of higher molecular weight, which do not accumulate on the metal surfaces to the same extent as the lower molecular weight carburettor detergents. They are more mobile and thermally stable which enables them to latch themselves onto the deposit precursors in the fuel, minimising further carbon deposition. Their longer hydrocarbon tails also allow them to dissolve better in the bulk fuel to provide better clean up capability.

The United States and Germany were the first to recognise and adopt the benefits of these new detergents in the mid 1980s. In both countries, detergent petrols were made available by Shell and other the major oil companies, after intensive research and development programmes.

However, perhaps inevitably, not all oil companies or petroleum retailers saw the light. The wider introduction in each market tended to come in the wake of vehicle problems resulting from carbon deposit formation. It was the motor manufacturers who took the lead, urgently requesting that all petroleum retailers should introduce detergents.

Injector fouling problems in the United States were so severe by 1985 that one leading motor manufacturer, General Motors, decided to write to executives at more than 20 petroleum companies to highlight the problem and request the immediate adoption of deposit control additives.

'Good gas lists'

Several automotive manufacturers also compiled and circulated 'good gas lists', identifying those gasolines which contained appropriate detergents. They told their service network to urge consumers to purchase fuel only from those petrol retailers which stated quite clearly at the point of purchase that their petrol contained detergent additives .

BMW went public in the United States in reporting inlet valve deposit problems in 1986. Company studies showed that noticeable degradation occurred during warm-up when small levels of deposit formed on the inlet valves. Again, BMW took the lead in pushing for greater use of deposit control additives in petrol.

The company entered into an extremely successful collaboration with the US oil industry. BMW developed its 10,000-mile vehicle test to evaluate a petrol's propensity to form inlet valve deposits. It then set passing standards on the basis of this test and permitted successful oil companies to use the BMW name in their petrol advertising. Oil companies worldwide accepted the test, which offered an effective way of differentiating themselves.

The story was the same in Germany, where vehi-

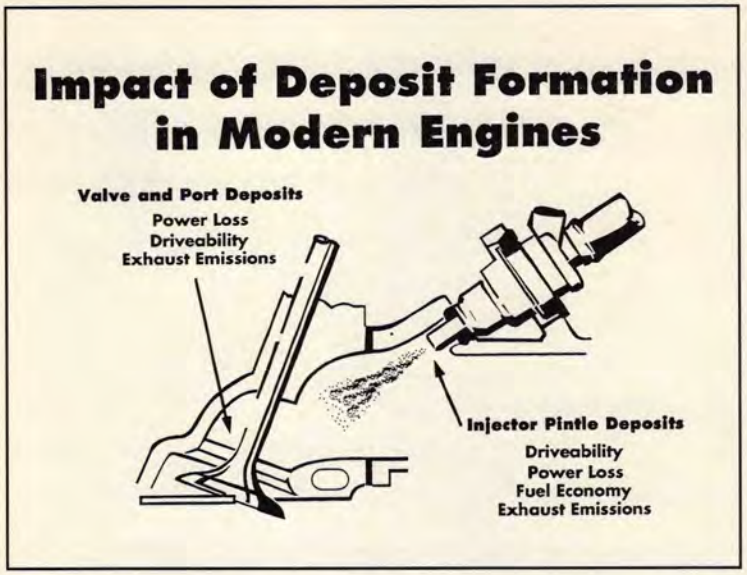


Figure 1

cle manufacturers took a similar approach in 1983 in response to a pervasive driveability problem linked to inlet valve deposits. They developed and successfully positioned the MIO2E 60-hour engine test as an unofficial standard for measuring a petrol's effect on inlet valve deposits. The test, which has been adopted as a CEC test procedure – a European industry standard test - is now widely accepted as a minimum standard which many European petrols are required to meet.

In 1989, the French manufacturers took up the baton, when they began issuing guidelines for a finished petrol containing detergent. To gain the French constructors or manufacturers Cahier des Charges approval and to meet the requirement for retail labelling, certain engine tests had to be passed to demonstrate the petrol's detergency performance.

Again, these engine performance requirements have now been adopted by the motor industry throughout Europe, via its industry body ACEA, which has tried to establish the standard as a minimum requirement for all petrols in Europe.

Fleet tests necessary

But the development of formulated additives should not only be in engine bench tests, but also in fleets, taking account of the full range of engine types, base fuels and the varying conditions in which engines operate. This is an area in which Shell additive formulation adopts a particularly strong approach. The problem with engine tests alone is that they can give false comfort. It takes time to develop engine tests – time in which the results can quickly become out of date. An additive which has been shown to perform correctly on the bench may, in comprehensive fleet tests, be shown up as old technology.

We need to look continuously ahead, even using engine prototypes. This kind of progress can only come from the strong links which have successfully been forged between the oil industries and motor manufacturers.

Increased UK use

So coming closer to home, why has the United Kingdom seen such a dramatic increase in the use of detergent additives over the past year? There are two reasons: the motor industry has demanded it and Shell and other oil majors have carried out high profile advertising and promotion of their detergent additives to inform customers better about the differences between quality fuels and base fuels.

Shell had been working on the problem of carbon build up in the carburettor since the 1950s. The company introduced an ignition control additive in the 1960s, a Super Detergent second generation in the 1970s. In 1988, Shell became the first fuel retailer in the UK to introduce detergent additives to all grades of fuel, with Shell Advanced Fuels. Behind the launch lay a research effort involving over 25 million miles of road tests in 17 countries, from the traffic jams of Hong Kong to the Arctic snows of northern Sweden.

In addition to our efforts and those of a number of other responsible oil majors, it was again the influence of the motor industry lobby which helped promote the use of additives. In the late 1980s and early 1990s, several motor manufacturers and importers in the United Kingdom were experiencing serious engine problems and malfunctions with their vehicles, found to be directly attributable to inlet valve deposits. To encourage oil companies and retailers to introduce effective detergents, the motor manufacturers allowed the use of their names as endorsements for petrols with detergents.

In spite of this crusading work, things did not change overnight. As recently as 1992, some 50 percent of the major oil companies, all the minor petrol retailers and all the supermarkets were still selling base fuels without detergents. The supermarket chains even went so far as to refute the benefits of detergents – a posture certainly not supported by scientific expertise or evidence.

Concern about inlet valve deposits was by now so widespread, however, that some manufacturers sent out approved petrol lists to their dealers in the United Kingdom. As in the United States, customers in the United Kingdom were encouraged to buy their petrol only from recommended suppliers. Ford and Rover, mindful of their customer warranties in respect of problems which might arise from inlet valve deposits, issued directions to their customers advising that they use only detergent fuels.

In October of last year, Shell commissioned a laboratory engine test for *The Times* newspaper which demonstrated that Shell Advanced fuel with its unique detergent additive package was 375 times cleaner than supermarket base fuel. Yet, despite such overwhelming evidence, some of the supermarket chains still denied the benefits of detergents. In the same month as the Shell test, one store even described detergent additives as 'an oil company marketing ploy', and said 'any customer benefits are imperceptible.'

Imagine our surprise therefore when, just a month later, in November 1993, the supermarkets performed a dramatic U-turn and started dispensing detergent petrols at their pumps. Clearly, commercial expediency had dictated a radical rethink. Having taken the decision to sell detergent petrol, they did little to explain to customers any specific performance benefits, nor any environmental or economic benefits of the detergents they were adding, despite increasing interest from customers.

THE INSTITUTE OF PETROLEUM

1 December 1994

Pollution Prevention Pays

Environment Discussion Group

The National Rivers Authority is engaged in an initiative to reduce the number of pollution incidents in England and Wales which are caused by oil (6,373 in 1993). Many incidents are the result of poor storage practice or spillage during delivery, while the disposal of waste oil into surface drains also causes concern.

Dean Mahoney and Philip Chatfield will give a description of the work being done by the NRA to prevent this pollution. This will include some backgroud to the problem, a look at recent statistics concerning oil pollution and the measures the NRA are taking to reduce oil pollution incidents.

The meeting commences at 5.30 pm and tea and biscuits will be served from 5.00 pm. The meeting is open to all IP members and their guests and there is no charge for attendance.

For administrative purposes will those wishing to attend please inform John Phipps at the IP. Tel: 071 467 7130. Fax: 071 255 1472.

THE INSTITUTE OF PETROLEUM

Tuesday 13 December 1994

The Reality of Reliability Centred Maintenance

By Robert Barnes, Director of Ansen Associates, Consulting Engineers

at the Institute of Petroleum

Organised by Energy Economics Group

IP Contact: Jenny Sandrock, 071 467 7104 (direct line)

THE INSTITUTE OF PETROLEUM

Joint Evening Talk

Wednesday 18 January 1994

Winners and Losers for 1995

Speaker: Mr Chris Hobson,
Energy Correspondent
Lloyds List, London.

Wine and Cheese will be served from 5.30 pm to 6.30 pm at the IP

Organised by Exploration and Production Discussion Group & Energy Economics Group

IP Contact: Sjoerd Schuyleman
Tel: 071 467 7132

THE INSTITUTE OF PETROLEUM

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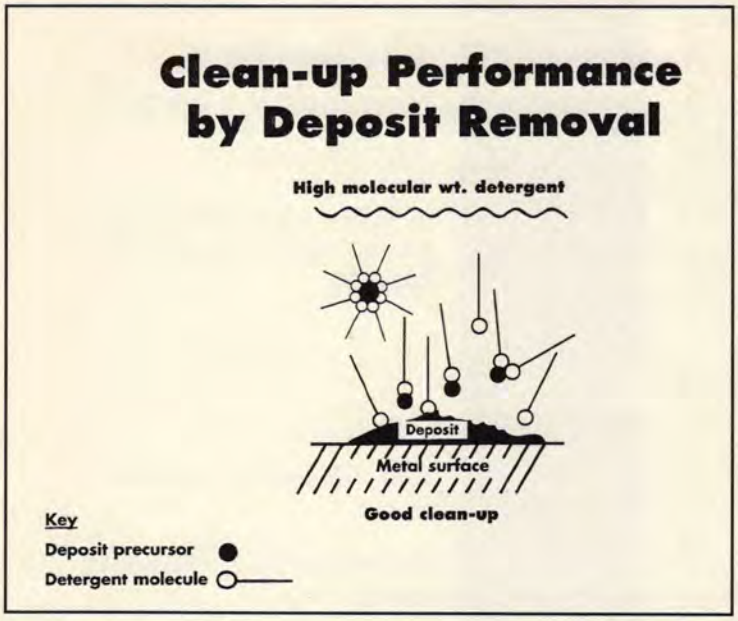


Figure 2

The supermarkets were in fact the laggards in a process that had been gathering pace since 1988, when Shell introduced detergents to all its fuels, and other oil majors had followed. By the end of the first quarter of 1994, 95 percent of all petrol in the United Kingdom contained detergent additives.

More legislation

Legislators are also paying attention. In the United States, the 1990 Clean Air Act Amendments have been introduced, stating that since deposit build up on injectors, inlet valves and ports has been proved to be a direct cause of increased exhaust emissions, deposit control additives must be added to reformulated gasolines as from 1995. The goal is to try to reduce still further the exhaust emissions over the lifetime of a car. Likewise, in January 1992, all petrols sold in California were required to contain detergents.

Here in Europe, we may see demands for detergents in fuels as a legislative requirement to meet tighter emissions standards. Already, the latest CEN standards for unleaded gasoline encourages the use of detergents. However the lack of appropriate test methods to evaluate a fuel's detergency performance will be a constraint.

Latest developments

Overall, then, the story is an encouraging one. The recent upsurge in the availability of detergent fuels in the United Kingdom, Europe and the United States is a highly positive development. However, we must not forget that the final beneficiary of the fuel quality is the customer. Customers still tend to pay more attention to other factors such as convenience, service or value for money when buying fuel, but there are encouraging signs in our customer research that awareness of fuel quality and detergents is rising.

We still have work ahead of us in explaining to customers what quality fuels can offer – better fuel economy, vehicle efficiency and lower exhaust emissions. We will be talking about the real impact on the customer's wallet in the long-term from poor quality fuels.

And increasingly we will be explaining how detergents themselves differ – with some performing both more consistently, and better, than others.

The way in which the supermarkets performed such a striking *volte face* last year must raise questions. The supermarkets purchase different additives and different fuels. I am sure they would stand by their products and testify to their properties but Shell brings decades of its own research, development and testing to its products and can therefore offer a unique, patented additive package with a guarantee of consistent quality.

In June my own company recently launched New Improved Shell Advanced petrols, containing the best detergent yet. The new petrols provide better fuel economy at 9 more miles on average per tankful; quicker acceleration, up to 10 percent faster in the 30 to 50 mph acceleration range; and a significant reduction in harmful exhaust emissions.

It has been gratifying recently to learn the results of another independent test, this time for New Improved Shell Advanced. A journalist in Scotland has conducted his own test, running his car more than 1,000 miles, in carefully mixed driving conditions, over four months, exclusively using New Improved Shell Advanced. Describing himself as 'a born sceptic', he was able to report after careful monitoring and exhaust gas analysis that he had achieved fuel efficiency up from 37 mpg to nearly 41mpg, acceleration up from 13 to 12 seconds, unburned hydrocarbons in the exhaust down from 281 parts per million to 257, and carbon dioxide emissions down from 3.41 per cent to 2.85 per cent.

Shell, he said, had 'hit the nail right on the head.'

But it is vital that the research and development of quality fuels continues – not least as standards of air quality and fuel efficiency become ever more demanding. Future work must rest, as in the past, on collaboration between the oil and motor industries. The two industries have long worked together to roll back the boundaries of technology, for the benefit of their customers and society as a whole.

The Shell announcement earlier this year of an additional £70 million of investment in Thornton Research Centre demonstrates our commitment to continuing progress in this vital area.

The auto and oil industries have joined with the EU Commission in the pioneering European Tripartite Initiative to deliver improvements in air quality. At the heart of the Initiative is an £8 million research programme – EPEFE – to investigate how fuel and engine technology link to air quality. The Initiative will lead to recommendations for cleaner European air for the year 2000 and beyond.

My own job involves me in extensive day-to-day contact with individual motor manufacturers, as we exchange and share information on new technology and developments. Far from being unusual, that is very much the norm.

This level of co-operation and pooling of resources at the most formal and informal level is extremely valuable in terms of what it contributes to future research and development. The way in which advanced fuels have now, finally, been accepted across the board is a tribute to the efforts of both industries.

This paper was given at an evening meeting of the IP London Branch in October.

Western European Lubricant Consumption in 1993

Research carried out by the European Union of Independent Lubricant Manufacturers (UEIL) shows that total lubricant consumption in Western Europe declined by 4.6 percent to 4.86 million tonnes in 1993. International bunkering accounted for 0.43 million tonnes.

These statistics show that consumption in all major lubricant markets declined with the exception of Great Britain. At the same time, industrial lubricant demand fell disproportionately further because of the economic slump. In 1993, Western Europe accounted for 13.5 percent of worldwide (domestic) demand which totalled about 36 million tonnes.

Lubricant Consumption (Domestic Sales) in Western Europe 1990 to 1993

Country	1990 tonnes	1991 tonnes	1992 tonnes	1993 tonnes
Germany	1,445,137	1,227,975	1,186,110	1,131,194
France	933,432	887,984	875,870	840,473
Great Britain	821,994	759,290	785,732	804,476
Italy	717,549	672,686	668,301	631,115
4 primary markets	3,918,112	3.547,935	3,516,013	3,407,258
Spain	460,000	474,000	430,500	373,000
Portugal	117,000	115,628	113,199	99,000
Belgium	234,498	180,481	197,691	172,926
Netherlands	177,915	176,919	187,197	178,436
Luxembourg	10,000	10,000	10,000	10,000 *
Ireland	55,500	38,500	36,500	37,500 *
Denmark	74,521	76,116	74,918	74,744
Greece	90,000 *	86,000	87,000	87,000 *
Sweden	160,169 *	138,329 *	136,046	126,163
Norway	84,428	81,872	75,049	70,662
Finland	101,854 *	82,192 *	81,068 *	83,491 *
Switzerland	77,636	72,930	69,269	65,997
Austria	85,000 *	85,000 *	82,380	76,960 1)
Other countries	1,728,521	1,617,967	1,580,817	1,455,879
Western Europe	5,646,633	5,165,902	5,096,830	4,863,137

Sources: CPL 1993 and 1992, Amtliche Mineralölstatistik and others
*** Quantities estimated or deducted from total sales incl. bunkering**
1) According to europe oil telegram dated 21.04.1994

World Lubricant Consumption (Domestic Sales) 1990 to 1993

Region	1990 1,000 tonnes	1991 1,000 tonnes	1992 1,000 tonnes	1993 1,000 tonnes	1993:1992 1,000 tonnes	%	1993:1990 1,000 tonnes	%	% of world in 1993
4 primary markets	3,918	3,548	3,516	3,407	-109	-3.1	-511	-13.0	
13 other markets	1,729	1,618	1,581	1,456	-125	-7.9	-273	-15.8	
Western Europe	5,647	5,166	5,097	4,863	-234	-4.6	-784	-13.9	13.5
CIS countries	8,420	7,750	7,150	6,721	-429	-6.0	-1,699	-20.2	
others	940	880	830	800	-30	-3.6	-140	-14.9	
Eastern Europe	9,360	8,630	7,980	7,521	-459	-5.8	-1,839	-19.6	20.9
Total Europe	15,007	13,796	13,077	12,384	-693	-5.3	-2,623	-17.5	34.4
Japan	2,167	2,150	2,117	2,022	-95	-4.5	-145	-6.7	
China	2,254	2,409	2,550	2,750	200	7.8	496	22.0	
others	4,684	4,901	4,970	5,220	250	5.0	536	11.4	
Asia	9,105	9,460	9,637	9,992	355	3.7	887	9.7	27.8
Africa	1,590	1,550	1,520	1,535	15	1.0	-55	-3.5	4.3
USA	8,419	7,605	7,774	8,001	227	2.9	-418	-5.0	
Canada	832	772	767	805	38	5.0	-27	-3.2	
North America	9,251	8,377	8,541	8,806	265	3.1	-445	-4.8	24.5
Latin America	2,910	2,650	2,700	2,740	40	1.5	-170	-5.8	7.6
Australia/Oceania	547	511	523	531	8	1.5	-16	-2.9	1.4
World Consumption (domestic sales)	38,410	36,344	35,998	35,988	-10	0.0	-2,422	-6.3	100.0
% against prev. year	+0.6	-5.4	-1.0	0.0					

Sources: CPL 1993 and 1992 and others. partly estimates or quantities deducted from total sales incl. bunkering

Lubricant Consumption (Domestic Sales and Bunkering) in Western Europe 1992 and 1993

-in tonnes-

Country	1992 Dom.Sales	Bunker.	Total sales	Bunker % of total	1993 Dom. sales	Bunker.	Total sales	Bunker % of total
Germany	1,186,110	56,568	1,242,678	4.6	1,131,194	55,324	1,186,518	4.7
France	875,870	45,164	921,034	4.9	840,473	44,300	884,773	5.0
Great Britain 1)	785,732	58,000*	843,732*	6.9*	804,476	60,000*	864,476*	6.9*
Italy	668,301	52,000	720,301	7.2	631,115	50,000*	681,115*	7.3*
4 prim. markets	3,516,013	211,732	3,727,745	5.7	3,407,258	209,624	3,616,882	5.8
Spain 1)	430,500	30,000*	460,500*	6.5*	373,000	26,000*	399,000*	6.5*
Portugal	113,199	8,000	121,199	6.6	99,000	7,000*	106,000*	6.6*
Belgium	197,691	32,000	229,691	13.9	172,926	35,000	207,926	16.8
Netherlands	187,197	86,988	274,185	31.7	178,436	83,000	261,436	31.7*
Luxembourg	10,000		10,000		10,000*		10,000*	
Ireland	36,500*	1,500*	38,000	3.9*	37,500*	1,500*	39,000*	3.8*
Denmark	74,918	3,000	77,918	3.9	74,744	3,000	77,744	3.9
Greece	87,000	41,000	128,000	32.0	87,000*	41,000*	128,000*	32.0
Sweden	136,046*	5,500*	141,546	3.9*	126,163*	5,200*	131,363	4.0*
Norway	75,049	12,000	87,049	13.8	70,662	12,000	82,662	14.5
Finland	81,068*	3,500*	84,568	4.1	83,491*	3,500*	86,991	4.0
Switzerland	69,269		69,269		65,997		65,997	
Austria	82,380		82,380		76,960 2)		76,960 2)	
Other countries	1,580,817	223,488	1,804,305	12.4	1,455,879	217,200	1,673,079	13.0
Western Europe	5,096,830	435,220	5,532,050	7.9	4,863,137	426,824	5,289,961	8.1

Sources: CPL 1993 and 1992, Amtliche Mineralölstatistik and others

*** Quantities or percentages estimated or deducted from total sales incl. bunkering**

1) Bunkering included in exports

2) According to europe oil telegram dated 21.04.1994

Raising obstacles in the road...

The report of the ***UK Royal Commission on Environmental Pollution,*** *published at the end of October, raised a multitude of controversial issues and made a host of recommendations which many hope will not reach the implementation stage.*

Essentially the commission wants people to abandon their cars and return to public transport. To this end they propose that the road building programme, agreed back in 1989, should be slashed and the price of petrol doubled. Without a radically different approach, the volume of road traffic in the next 25 years was likely to increase, even to double according to one scenario. The government's aim, according to the Commission, should now be to adopt policies that will cut air pollution.

The 17 members of the Commission spent two years studying transport systems here and abroad and hearing evidence from interested parties. The 325-page report, therefore, reflects a considerable body of evidence and the sum of many viewpoints.

The main recommendations (out of a total of 110) are:

- To halve expenditure on motorways/trunk roads
- To tighten EC emission limits for all new vehicles
- To vary duty on heavy vehicles according to their emissions
- To ban super unleaded petrol
- To encourage the use of natural gas for heavy vehicles
- To meet WHO air quality standards by the year 2005
- To double the price of petrol by 2005
- To tax aircraft fuel
- To improve the fuel efficiency of new cars by 40 percent by 2005
- To cut CO_2 emissions to 80 percent of 1990 levels by 2020
- To increase freight traffic going by rail
- To encourage new light railway and tram systems

The report states that transport is the most important source of air pollution and that emissions from cars and trucks govern the quality of the air we breathe in an urban environment. At times, because of unusual climatic conditions, the level of some pollutants can climb above World Health Organisation guidelines – in London last summer it occurred on several days.

The Commission makes radical proposals – it wants substantial increases in the numbers of people abandoning their cars, turning to public transport, and taking to bicycles or even walking. It proposes a target of quadrupling the number of cyclists in urban areas.

These suggestions have raised alarm bells in many quarters including the British Road Federation, the

AA and RAC, those who make and fuel vehicles, men and women who are accustomed to their own set of four wheels taking them to work, to the shops, to school and especially those who live a distance from bus routes and railway stations.

On the other hand, sections of the report received a warm welcome. Steven Norris, Transport Minister, said, ' For the sake of the environment, we must try to tone down this love affair with the car.' For his part, Transport Secretary Dr Brian Mawhinney stated that he would refuse to stop the government's road-building programme but that he would consider the rest of the report carefully.

On the day prior to the publication of the Royal Commission Report appeared another closely related report – the House of Commons Transport Committee's **6th Report of Transport-Related Air Pollution in London.** This was reported in the daily press under headlines such as 'MPs seek ban on super unleaded petrol sales' , 'MPs seek inquiry into dangers of super unleaded' and 'Green petrol a "cancer threat"'.

Following its investigations, the report concluded that health dangers arising from the use of unleaded petrol were serious and outweighed the benefits derived from reduced lead levels. It called for a government inquiry into the use of unleaded petrol in cars not fitted with catalytic converters, maintaining that emissions from cars using unleaded petrol without a catalytic converter were worse than from using leaded petrol. The report concluded that super unleaded petrol represented a 'serious' health hazard, blaming excessive levels of aromatics, including benzene, which has been linked to cancer and childhood leukaemia.

Anticipating the message of the Royal Commission on Environmental Pollution, it proposed some form of restriction, whether by pricing or by physical means, on the use of vehicles in urban areas, particularly London.

Environment Secretary John Gummer said, 'There is no evidence that there is a significant difference between levels of benzene in emissions from uncatalysed cars running on premium unleaded or four-star petrol.' He added that there were no grounds for making any policy changes.

Commenting on the Royal Commission's findings, a UKPIA statement said that since the introduction of unleaded petrol in the late 1980s total emissions of petrol-related benzene had been falling, not increasing. This downward trend is due to a reduction in the average level of both benzene and all aromatics in UK petrol and will be further accelerated as cars with catalytic converters become more widespread.

It went on to add that 'There is no evidence to suggest that the levels of benzene emitted from the exhaust pipe of a non-catalytic car using super unleaded increase any risk to the motorist, as their impact on air quality is negligible.' Moreover, according to UKPIA, there is no evidence that the very low levels of benzene exposure associated with motoring are a risk to the public.

What is the Institute doing?

Air quality health issues are considered by the IP Advisory Committee on Health. The following work and studies have been undertaken over recent years.

1. In 1988 the Institute funded the Robens Institute at the University of Surrey to provide a summary of research work conducted to assess carcinogenicity of automotive emissions. This report did not identify problems with gasoline but concluded that some occupational groups whose exposure to diesel exhaust fumes is greater than that of the general population may have a very small increase in risk. However, it was not possible to estimate the effects of cigarette smoking in some of these studies. The report concluded that there was no significant risk to the general population.

2. Since 1980 the Institute has funded a very large study of international importance on the mortality of refinery and distribution centre workers. Reports on this work were published in 1981 and 1991. The study examined the cause of death of these workers and compared the results with the cause of death for the general population. These reports showed no overall increased risk of death to the workers from cancer and many of the non-malignant causes of death. However, a small but not statistically significant excess of deaths from leukaemia and kidney cancer was identified among distribution workers.

A follow-up case control study which is the largest-ever study undertaken in exposure to benzene is underway to assess whether or not there is any association between leukaemia and benzene exposure in this group of workers. This involves detailed qualitative exposure estimation and is designed to assess the effects of low level occupational benzene exposure, an area where little data currently exists and which is critical if both occupational and community exposures at an international level are to be set on a scientific basis. The report is expected next spring.

In addition a separate study of cancer incidence amongst refinery and distribution centre workers will be undertaken.

3. Last year the Institute commissioned a review of the epidemiological literature on the human health effects of benzene by a recognised national expert. (Copies of this publication can be purchased from the IP Library.)

4. The Institute organised an internal workshop last February to discuss air quality and its effects on respiratory diseases. This was attended by oil industry professionals and recognised national experts. The meeting identified the health issues with particular relation to the oil industry and these have formed the basis for initiating further collaborative work. Two IP publications, 'The Health Aspects of Air Quality' and a summary of the workshop discussions, are now available from the IP Library .

5. An examination of published work on the health effects of particulates from diesel engines is underway and will be available shortly.

Domestic gas taps turn to competition

By Susannah Cardy

In the summer the Cabinet was all set to reject it. Newspaper headlines screamed out warnings of higher prices; Tory backbenchers became concerned for their constituency seats. Even the Prime Minister was said to be unconvinced. But then the tide of opinion appeared to change. The independent gas suppliers began to lobby Parliament long and hard. They even took a stand at the Tory Party Conference. Then came the Post Office debacle which put paid to fears that there was not enough Parliamentary time for two major industry bills. And finally, in last month's Queen's Speech, came the news that all the independent gas suppliers had been waiting for – the domestic gas market was to be opened up to full competition by 1998. Petroleum Review interrupted the celebrations to ask Mr John Astrop, Commercial Director at Kinetica, about the future.

Susannah Cardy: Why, after all the uncertainty, did the government eventually decide to abolish the monopoly in domestic gas?

John Astrop: In recent months the independent suppliers have worked hard at persuading the opinion-formers that competition is good. I also think that British Gas has helped persuade people by some of its own actions. By threatening to increase the standing charge, for example.

'I don't see "cherry-picking" as an issue as long as British Gas avoids distortions in its own transportation charge structure'

A lot of the constituencies that originally saw themselves as being at risk from competition began to see themselves as being at more risk if British Gas continued to have no competition.

Have the independent suppliers suffered from all this uncertainty?

I think we've all suffered from not knowing whether we were going to be shown the green light or not. Major investment is required when it comes to serving a large domestic market and no shareholders like uncertainty.

Isn't the market due for a shake-up anyway?

Undoubtedly and it will start happening very soon. Margins in the industrial and commercial market are under extreme pressure at the moment and there is very clear evidence that some companies are trading at a loss. To compete in the new domestic market, companies will need to invest in new systems, in expert staff, etc. The days when somebody could operate in the gas market from a fax in their front room are gone. Meanwhile, those companies which are in a solid position will benefit from a market with less froth.

How many companies are likely to fold?

Of the 20 or so active companies, it is generally believed that the market will lose five to 10 players. This will leave four or five larger companies and maybe 10 or so niche players in particular areas of the country or parts of the market.

Is the market going to lose any major companies?

There will probably be one or two withdrawals of a fairly serious size.

Are margins in the domestic market any higher than in the industrial and commercial market?

They probably aren't overall, because the domestic market involves higher costs in terms of investment in people and systems.

The majority of so-called 'independents' are offshoots of the oil majors. Given its low margins, isn't the real appeal of the domestic market the opportunity for producers to extract a higher value from their North Sea gas reserves?

It is often said that the gas market is a chain and in the future it's going to be increasingly important to be in as many parts of that chain as you can if you're going to optimise your operations and income. In the past, there was no need for the upstream producers to become involved in the downstream market. Nowadays, one can argue that it is essential.

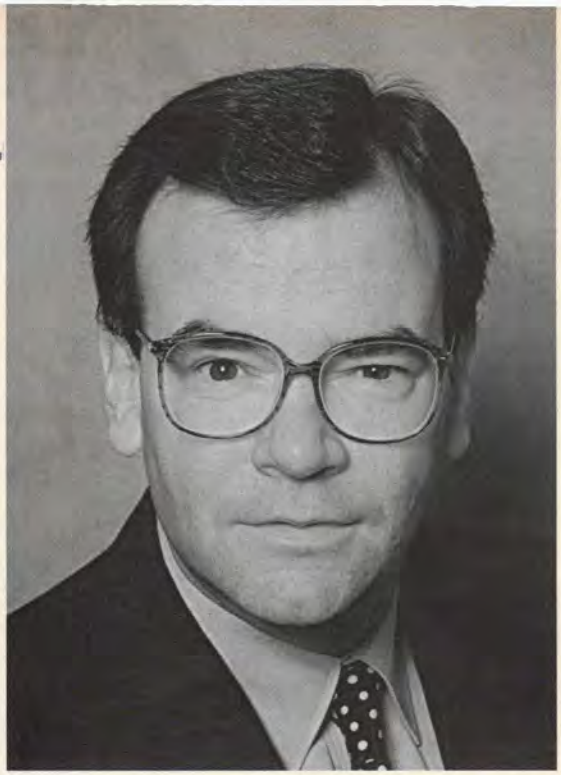
However, as you know, there is an arms-length relationship between upstream suppliers and their downstream affiliates. We have got two very substantial blue-chip companies behind us and that is essential if you are in the gas game.

So you agree that extracting a higher value from North Sea reserves is the real appeal?

That's certainly one of the appeals.

Isn't gas going to be more expensive at the beachhead now? After all, if you sell a product at auction, you tend to get a higher price for it than if you sell it via single negotiations.

That's not necessarily true. Over the past 20 years, we've sometimes seen British Gas use its monopoly purchasing position to get very good deals. At other times, it has not been able to exercise those powers because not much gas was coming forward. It depends very much on the state of the market. Over the last five years, gas has been sold at fairly high prices at the beach partly because the power generators began to



buy large volumes. Now we're seeing a response to those high prices from the producers and, as a result, we are now in a period of over-supply and prices have come down quite sharply in the last few months. In the next few years we may see lower prices at the beach even though there are more players in the game.

What's going to happen to the upstream game?
The traditional separation of upstream and downstream at the beach will have to be reviewed because increasingly suppliers will want to buy their gas in a variety of ways and not just on long-term depletion contracts. If the upstream producers don't adapt to that then they won't sell much gas. We may actually find some downstream companies moving into the upstream arena because they understand the market needs better than the upstream companies.

What do you think of the government's plans to introduce competition into one county first as a trial run?
That may be more practical than the original idea of having five percent of the market opened up in 1996, followed by a further five percent in 1997. However, it isn't going to be easy. It has all the makings of a bun-fight amongst the suppliers. The danger is that suppliers will see the trial as a loss-leading operation and that may then encourage customers across the board to expect more price-cutting than is actually sustainable. And it's not necessarily in the customers' interest if they are misled into thinking that competition can reduce prices by 50 percent because it can't. There's still a lot more debate to come. For example, how many shippers is it sensible to license for that trial? 30? 100? The way the trial is structured is going to have a major impact on how valuable it is.

It is rumoured that the trial will take place in the southwest where customers are expected to benefit least from competition. Presumably the idea is that these customers will at least benefit from an initial scramble to cut prices?
It appears to be a good place to start the process in view of the sensitivity of consumers located at the extremities of the system.

What is your attitude towards proposals for a levy which would prevent 'cherry-picking'?
I think it may prove unnecessary because I believe you will find that the independents will inevitably spread themselves across the whole of the market over time. The term 'cherry-picking' has been bandied about a lot of late. But if you look at the industrial and commercial market, British Gas is itself responsible for the so-called concept of 'cherry-picking' by having a differential between its own selling prices and transportation costs. That shouldn't happen in the domestic market because the transportation structure has been evened out and, should transportation costs come down even further in 1997, there will be an incentive for all of us to look at all parts of the market. I don't see 'cherry-picking' as an issue as long as British Gas avoids distortions in its own transportation charge structure.

But are you suggesting that, in the meantime, British Gas should take responsibility for the 'less desirable' customers?
I'm saying that to hit the whole of the industry with a levy which may not be justified seems a rather long way round of doing things. Why not let the market evolve and see how the take-up of various customer groups is going and then see if anything needs to be looked at? After all, the market isn't going to move away from British Gas overnight. It will probably retain more than 50 percent of the market well into the next century.

What is Kinetica's response to the OFGAS discussion document on creating a spot market in gas?
The document suggests that OFGAS might need to be formally involved in some way. We believe that this is unnecessary. Parties will be happy to play in the market if the prices and terms are right. The only area of concern is how Transco will operate the so-called flexibility market which has been proposed for those days when top-up supplies may be necessary. There's a role for OFGAS there but not in the day-to-day trading market.

How will the independents avoid buying in too much or too little gas?
We have had to make very careful calculations of our requirements day by day, year by year and so far we've managed to get it about right. But this is an issue that will test everyone's calibre and ultimately their ability to stay in the game or not.

Relations between the independents and Transco haven't always been smooth. How much trust now exists between the two?
Everyone's been surprised at how quickly the division between Transco and the trading part of British Gas has developed over the last six months. What's encouraging is that we're seeing a much more business-like approach from Transco – an interest in running their business for the benefit of their customers, rather than seeing themselves as part of British Gas. However, if the British Gas boardroom were to decide to operate these companies for an overall British Gas gain, then we would still be vulnerable.

So you don't put complete trust in Transco yet?
It's too early but we're happy to discuss our likely use of their services, future plans for buying gas, areas for working together on new pipelines, reinforcement and so on.

How hopeful are you that Transco will be re-valued in 1997?
As you know, a group of independent shippers have

had a firm of reputable consultants look at the valuation of British Gas's assets and they have been found to be substantially over-valued. If we succeed in persuading OFGAS of that argument, then there could be quite sharp reductions in transportation charges in 1997.

How will security of supply be assured?
On a day-to-day basis, this is not an issue. Transco will have the responsibility for making sure that the pipes stay full and that the system is operated safely. The bigger issue is whether an individual shipper will have sufficient reserves to serve his customers. You need credible operators who have got sufficient backing and substance to go and purchase the right portfolio of gas and the right storage facilities for their particular market. We are confident that the combination of long-term purchasing plus the operation of the short-term spot market will actually mean that the market will provide an answer to the security of supply issue.

Is Kinetica still maintaining that customer prices will drop by an average of 10 percent?
Assuming that the transportation cost structure is sorted, yes.

Will you cross-subsidise?
It's very difficult to tell because we don't know what obligations we will be under yet. However, each shipper is likely to develop its own approach to the market. Companies will package their tariff structures in different ways to appeal to different bits of the market.

Are you going to offer total energy packages?
We're looking at a number of interesting packages. It should be possible to combine gas, electricity, telephone and water through a common billing system but the scope for offering new services goes beyond this.

How worried are you by customer inertia?
At the small end of the market below 25,000 therms, there is tremendous inertia. Customers have got plenty of other things to think about other than their gas bills. What we've tried to do at Kinetica is to concentrate on offering as simple a concept as possible so that customers can see the advantages of transferring to us without having to get too involved in the complexities of the gas business. We're the first independent shipper, for example, to use TV as a medium. And this has been very valuable in terms of raising our profile. Certainly market research suggests that domestic customers are willing to move away from British Gas provided their concerns on safety, security and price are met.

'It should be possible to combine gas, electricity, telephone and water through a common billing system'

What percentage of the domestic market will the independents ultimately take?
I see no reason why British Gas should be hanging on to any more than a non-monopoly share of the market - ie 25 percent or less – in 10 or 15 years' time.

Can you elaborate on Kinetica's plans to build further major onshore gas pipelines?
There are some projects on the drawing board because there will be a need to reinforce the British Gas system in one way or another within the next five to 10 years. This, together with the obvious advantages of linking up with the Interconnector, leads us to believe that there may be opportunities for an independent network to take the strain off the British Gas system and provide a competing service at a lower price.

Pay now ... pay less

Following the proposals in the Queen's Speech on the end of the British Gas' monopoly in the domestic market, the company announced tariff changes that will increase prices for domestic customers.

Rises of 2.9 percent are scheduled to come into effect on 1 January and will also apply to standing charges. This increase comes three months before the value added tax (VAT) on fuel goes up from 8 percent to the full 17.5 percent, as announced last year.

The first gas price rise since 1991, it has been approved by Clare Spottiswoode, the OFGAS regulator. The size of the rise falls within the pricing formula currently imposed on British Gas.

Under a new concession, those who agree to pay their gas bills by monthly direct debit will enjoy a discount of 2.8-5.6 percent, depending on the volume of gas consumed. It is forecast that perhaps only 5 million customers out of a total of 18 million will take up this offer. A wider use of direct debit would help British Gas to cut the cost of bill collection, encourage prompt payment and thereby reduce difficulties caused by late payers. Discounts for other forms of prompt payment are promised next year when a new billing system is in place.

British Gas is intent on streamlining its domestic sales business in the period before the market is opened up to independent gas suppliers, who at this stage are promising to undercut the domestic tariffs of the monopoly supplier by 10 percent.

Mike Alexander, Managing Director of Public Gas Supply, British Gas, said, 'Until now British Gas has operated a pricing structure under which everyone pays the same for their gas, regardless of where they live and regardless of whether they pay their bill on time or how much gas they use. This has built significant cross-subsidies into the system.'

He added, 'It is apparent that the largest of these cross-subsidies relates to how customers pay. What we aim to do is create a pricing structure which encourages people to pay promptly. It is unfair for those customers who do pay promptly to subsidise those who deliberately delay payment.'

Differentiation between customers is a fresh approach for British Gas. It represents a first move towards competing with other suppliers when the monopoly comes to an end. Fears have already been expressed that with the introduction of a free gas market, a range of pricing might be introduced by any of the supplying companies to the disadvantage, say, of the small consumer, those who live on the fringe of the distribution system or far from the supply source.

British Gas is understood to be considering other pricing options – for instance, whether to introduce regional variations.

Jungle juice – tapping the Amazon's petroleum reserves

By Terry Knott

In the remote heart of the Amazon rain-forest, Brazil's state oil company Petrobras is steadily increasing hydrocarbon production from a region whose massive energy potential is matched by the combined challenges of logistics, climate and environmental conservation. The achievements of the past few years, and the plans for future development, are bringing the promise of the Amazon's hidden reserves ever closer.

With the successful completion three months ago of the first horizontal well to be drilled in the rain-forest of Brazil, the latest know-how in production technology has effectively arrived at one of the more inaccessible oilfields in the world.

Located 600km southwest of Manaus and four degrees below the equator, the Rio Urucu region lies deep in the state of Amazonas. Stretching over 1.5 million square kilometres this is the largest of Brazil's two dozen states – more than twice the size of Texas and densely covered with an endless green canopy of trees which parts infrequently to reveal the rich red soil and winding tributaries of the River Amazon. But nowadays there are other clearings in the steamy rain forest around Urucu, the man-made variety which are home to supply bases, production sites and storage terminals, plus the occasional glimpse of a drilling derrick reaching above the trees.

Site of first horizontal well in Amazon region
PHOTOS BY TERRY KNOTT

Output increasing

Since Petrobras began drilling here in 1986, the company has invested some $450 million in exploration and production operations, and is confident that the region will play an increasingly important role in meeting Brazil's growing energy demands.

'We have drilled a total of 96 wells to date,' says Petrobras chief production engineer for Urucu, José Tavares Almeida. 'At present 30 wells are in production with 10 more completed and ready. Once we have installed new compressors next May to increase gas reinjection capacity, these wells will come onstream to boost production by about 25 percent.'

Urucu produces 16,000 barrels per day of high quality oil plus 850,000 cubic metres per day of gas at present, an output restricted by reinjection capacity which is currently only sufficient to supply two wells. Four new Nuove Pignone compressors, each capable of delivering 200,000m^3/d of gas at 4500psi will be able to reinject to all wells, giving Urucu the ability to produce more hydrocarbons. Urucu could hold over 80 million barrels of oil and condensate.

The proven gas reserves of the Amazon were put at 21.8 billion cubic metres by Petrobras at the beginning of 1994, amounting to 16 percent of Brazil's total proven gas reserves, both on and offshore. But overall it is believed the Amazon region could hold three to four times this volume. At a time when Brazil has acknowledged the importance of gas in its future energy plans – a $2 billion deal was recently signed with an international consortium to bring Bolivian gas to Brazil via a 3150km pipeline – interest in the potential of Urucu is understandably on the increase.

Physical challenges

But at the sharp end of operations in the rain forest, it is the day-to-day challenges of production that principally occupy Mr Almeida and his team.

Urucu Base is the headquarters for the region, with the 180 personnel based here representing only part of a 1,000-strong workforce distributed around the many worksites. A small airstrip carved from the forest is the contact point with Manaus, a two-hour flight away by fixed-wing aircraft.

'We have a network of roads connecting the sites, but these lead to nowhere else – the geographical isolation is similar to an offshore platform,' observes equipment engineer Julio Barreto Venancio. 'In the rainy season from December to May, when monthly rainfall averages 600mm, many routes are impassable and we have to rely on helicopters.'

The remote location of Urucu has been a challenge for Petrobras from the outset. Initial geological investigations required personnel to be dropped into the rain-forest by helicopter, armed with machete and accompanied by locals from the Tefé area, descendants of the Carauari Indians familiar with the territory.

All heavy equipment and supplies are brought up the Amazon, Solimoes and Urucu rivers to Porto Urucu, established by Petrobras as the supply base for the area. 'Much of the equipment we need is imported from abroad,' says Mr Venancio. 'The light equipment we can fly in from Belem, but the heavy

Schematic location of Urucu production area, a week-long river journey from Manaus

items must come by river, a journey which takes 15 to 20 days. The supply logistics for spare parts is one of the big challenges of working here. Another is the climate – in addition to the high rainfall it's extremely humid with temperatures averaging 35°C and often well above this.'

Six kilometres from the base is the main processing site. It is to here that oil and gas from the scattered well sites is transported to be separated and treated prior to storage and export.

Following three phase separation – water cut is very low and treated prior to discharge – Urucu's oil is ready for export. The oil is of high quality with specific gravity of 44°API, enabling part to be processed on the spot to produce diesel fuel, up to 75m^3/d being manufactured to run the engines and drilling rigs in the region.

Separated gas is used for four purposes. Of the current production, about 85 percent is reinjected, another 10 percent converted to liquefied petroleum gas (LPG), and the remainder used for fuel or flared. The LPG plant, designed and built by Propack Systems of Calgary in Canada and re-assembled on site, produces up to 110 tonnes per day of LPG.

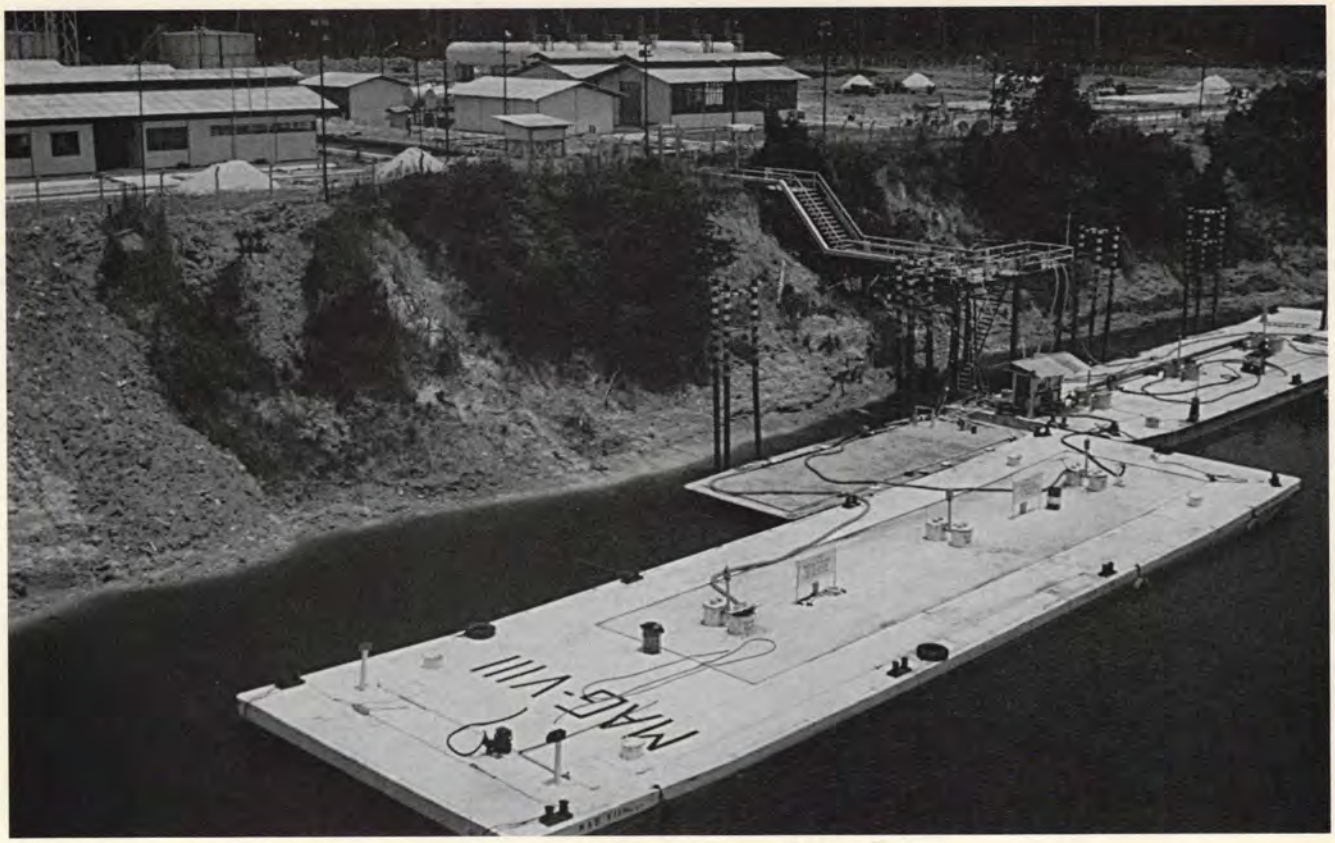
From the production unit, oil and LPG are transported by pipeline to Porto Urucu 5km away. The relatively easy solution of exporting directly from Urucu is not a full-time option, as while the Rio Urucu is navigable by small vessels for part of the year, in the dry season water levels drop to the point where this is no longer possible. To overcome this, Petrobras has constructed two pipelines to transfer the oil 54km westward to the Rio Tefé which remains navigable all year round.

The first 4.5in diameter pipeline was built in 1989, enabling continuous oil production from Urucu to proceed with oil export via the specially constructed Porto Terminal on the Rio Tefé. In 1992, a larger 10in oil line was added and the smaller line was dedicated to LPG transfer. Storage capacity at the terminal is currently 10,000 barrels of oil and 600 tonnes of LPG – at the end of this year two new oil storage tanks will increase capacity to 40,000 barrels.

Hydrocarbons export takes place every few days, with the liquids being transported in shallow draft barges for the journey to the town of Tefé where the cargo is transferred to larger vessels for navigating the main river. The 990km voyage along the Tefé and Solimoes to the Petrobras Reman refinery at Manaus takes over a week.

While making progress in the development of Urucu, Petrobras – which could soon have its monopoly on hydrocarbons production opened to international competition – is constantly seeking ways to make

Directional drilling reduces the felling of trees



Loading barges on the River Tefé for the voyage to the Reman refinery

the unit more cost efficient. Addressing the seventh Oil and Gas Expo in Rio de Janeiro in October, Petrobras managing director of exploration and production Joao Carlos de Luca referred to the oil company's cost reduction initiatives as 'adjusting costs to international reality'.

First horizontal well

Operating costs in Urucu are currently at $3.95 per barrel, and are expected to come down further. One approach to achieving this is in the use of new technology, the primary case in point being the first horizontal well in the region, which is now in production.

Drilling of well 7-RUC-34H-AM by Petrobras began this summer using rig SC108. The target was a 15m thick oil zone lying some 2500m below the surface. Over a period of 77 days, a total of 3080m were drilled: 24 days for the 1830m vertical section, 40 days for the directional turn covering another 920m, and 13 days to complete the 330m long, 7in diameter horizontal hole. Final cost of the well is put at $10 million, about 2.5 times greater than a conventional vertical well says Petrobras. However, the increased capital cost will be recovered by improved output from the new well. At present this is around 1500b/d of oil plus 30,000m^3/d gas, about 3.5 times greater than a typical conventional well in Urucu.

With the success of the horizontal well, it seems likely that future drilling will employ the technique more widely. Eight wells are planned for 1995, and exploratory wells are already underway further afield near Tefé and in neighbouring Acre state.

Urucu's energy potential is also attracting outside interest. An agreement to supply gas to Electronorte, the northern operation of state power company Electrobras, is awaiting signature. A decision on how to best use the gas is still pending – one option could be a 450km pipeline to supply gas-fired power plants at Porto Velho to the south. More recently foreign investors have made proposals, including Japanese giants Mitsubishi and Nissho Iwai which are believed to be considering funding a 180km pipeline to either Tefé or Coari further downstream on the Solimoes, with the construction of a large LNG production facility.

Rain-forest preserved

Whichever option is chosen, Petrobras is determined that any development will be carried out with the minimum impact on the rain-forest environment, a policy which it has pursued throughout Urucu operations. When a new site is planned, experts are sent in to catalogue the species of trees and plants, so that these can be re-established by replanting when work at the site is completed. The size of drilling sites in particular has been kept down by opting for directional drilling which enables a cluster of five wells to be achieved from each location, drastically reducing tree clearing to an area about 200m by 200m. Helicopter pilots have been closely consulted to ascertain their needs for take-off and landing visibility, resulting in fewer trees being removed and others being only lowered in height.

Not far from Urucu Base lies a clear demonstration of Petrobras' environmental awareness and conservation effort. Here, in co-operation with a number of government agencies and academic institutions, the company has established a farm dedicated to the preservation of rare orchid species from the rain-forest. If Urucu's hydrocarbon potential is able to blossom as fully as the indigenous orchids, Brazil's energy needs will be well served.

Peru — Privatisation draws in major new investments

By John Cranfield

The next couple of months will see completion of Peru's energy privatisation campaign. Not only will state firms vanish, but long-standing restrictions on what the private sector can and cannot do are also being swept aside. The aim has been partly to improve efficiency, but mostly to boost the energy sector so that it can make even more of a contribution to national earnings. For, along with the rest of the country's massive known mineral wealth, oil and gas development has barely scratched the surface. Overall, it is reckoned that 88 percent of Peru's mineral potential remains to be unlocked. Privatisation is seen as the most effective way of opening that door.

The speed of sell-off has been impressive. Plans were only kicked off early in 1992 and, before anything could come up to the auction block, fundamental laws had to be rewritten and passed through parliament. But as soon as this had happened, sell-offs proceeded apace. This was made easier because much of the oil-related industry could either be compartmentalised or was already run as separate entities, although still under the overall state umbrella. And the law changes meant that state oil firm Petroperu could hive off marginal activities, rather than having to await a single buyer for what had gradually become a somewhat cumbersome entity.

Late last year a new holding company, Perupetro, was formed to oversee the breakup and privatisation of Petroperu. To some extent this was already under way but new laws passed towards the end of 1993 meant that moves could be speeded up, with Petroperu being split up into its main components of production, refining, transport and marketing. Under the new system Perupetro will handle the negotiation and supervision of exploration and production contracts. With that activity taken away, Petroperu becomes just another operating company, initially state owned but, by October this year, due for transfer to the private sector.

However, Energy minister Daniel Hokama subsequently announced that the government had decided to keep a stake in Petroperu. This will amount to 40 percent, but a quarter of those shares will be made available to Petroperu workers via a stock-option plan.

Chipping away the monolith

Last year also saw the sale of many Petroperu filling stations, on a piecemeal basis. The biggest single disposal comprised state tanker firm Petrolera Transoceanica, sold to Chilean interests for $24.1 million. Since then, emphasis has been on hiving off production assets under new exploration and products contracts. These have the dual role of not only boosting the oil search but of funding the rehabilitation and expansion of underperforming fields. The legislative changes have also had the effect of boosting investment by the existing private sector.

Underlying privatisation and liberalisation moves is the government's wish to see oil production top 250,000 b/d by 2002. According to official Perupetro data, 1993 output was 126,300 b/d, while this year 132,000 b/d is forecast. The government also hopes to see reserves lifted from 1993's 350 million bbl to 1 billion bbl by 2002. Just the anticipation of change had an effect, since last year's output was well up on 1992's 115,600 b/d.

Oddly enough, given the dominant role played by Petroperu, it has long been the private sector that produced most oil. Last year, Occidental turned out 57,300 b/d, with a further 5,200 b/d coming from an Oxy/Bridas joint venture. In comparison, Petroperu produced 42,800 b/d. Third in line came Petromar, Petroperu's offshore unit, with 19,300 b/d. Petromar, formed in 1985 to run the expropriated Belco concession, has now been liq-

Huge mountain chains and major rivers make Peru an expensive place for pipelining

Pacific Block Z-2B

uidated and the block, Z-2B, transferred under a new search and production deal to US-based Petrotech.

Petrotech has a 30-year deal, with a $65-million expenditure commitment for the first seven years. Initially, output will fall, Perupetro forecasting 17,700 b/d this year compared with a peak of 20,700 b/d achieved just before the handover. The reason for this is the need to work-over many of the currently-producing wells. Then, over the next three years, Petrotech will drill 40 new development wells, with the aim of taking production up to at least 30,000 b/d. Exploration over the block is set to run for six years, with a one-year extension option. And, if Petrotech is prepared to develop non-associated gas already found in the block, the concession will be extended to 40 years.

Tieing in jungle output

A similar deal has now been signed between Perupetro and US-based Maple Resources. Again, underdeveloped reserves are the target, this time in the central jungle. Two 1960s oilfields are included in the deal, currently producing 800 b/d between them. These - Petroperu-operated Maquia and Agua Caliente - are joined by the underdeveloped Aguaytia gas field, found by Mobil/Petroleros El Oriente in 1961. The three are hived off from Block 31 and will be linked in with a refining and power-generation project.

The deal provides for a 30-year concession for the gasfield, which is reckoned to hold proven reserves of 225 Bcf gas and 21 million bbl NGLs. Maple is to spend an ultimately planned $68 million partly to prove up probable reserves of 175 Bcf gas and 14 million bbl NGLs. The two oilfields are covered by a 20-year concession, with a 50 percent production hike the target. Linked to these basic deals is a 20-year rental agreement for the 3,250-b/d Pucallpa refinery, destination for crude oil and NGLs from the three fields (Figure 1). Dry gas will be used locally to some extent but most will find its way to a new power station.

At present a three-phase development is envisaged, initially involving testing and workovers. The two existing wells on Aguaytia are reckoned able to produce some 30 MMcfd, enough for initial plans. Oil production will be boosted by workovers and then by additional drilling - one new well on Maquia and two on Agua Caliente. This phase should take about a year, with Phase 2 occupying a similar period, dedicated to installing a gas-processing plant at Aguaytia and a pair of 90 km pipelines to Pucallpa. One, of 6 1/2 inch diameter, will convey up to 20 MMcfd of gas. The other, of 4 1/2 inch diameter, will handle 1,000 b/d of NGLs. The latter will be processed at Pucallpa in a new fractionator. Propane and butane will be stored at Pucallpa, for local distribution. Heavier fractions will go to the middle-distillate stream at the refinery, again with products being distributed locally. The local market in Pucallpa town will initially be able to absorb up to 6 MMcfd of gas, the surplus being reinjected to start with.

Phase 3 will see a second process plant built at Aguaytia. This will double NGL flow to Pucallpa. But, more importantly, it will provide a sizeable regular gas flow for a new power station to be built at Tingo Maria. This will require a 100-km, 12.75 inch pipeline. Power from the station will be fed into the grid run by Electroperu, also in the throes of privatisation. The advent of a new thermal power station is important since, at present , of the country's total capacity of 1,864 MW no less than 1,560 MW is based on hydroelectric power. Variable rainfall sometimes causes havoc with electricity supply and Aguaytia gas is seen as an ideal way to even out peaks and troughs.

An earlier plan to develop Aguaytia, put forward in 1988 by Pemex, came to grief. Financing problems arose, largely caused by the restrictions in the then current petroleum laws. Similar problems beset Shell's plans for the far-larger gasfields further south in the Ucalayi River Basin. There, the problem was outlet. Electroperu's grid is split in two, with the south of the country separated from the rest (Figure 2). Both Aguaytia and Shell's Camisea gasfields are to the east of the Andes, in the headwaters of the

Amazon. Unhappily most population of the and energy demand - is on the other side of the giant mountain chain. Aguaytia can be exploited because the northern electricity grid is reasonably close by. Camisea has no such advantage.

Fathoming out the big one

Although earlier Shell plans for Camisea gas came to nought, the government is trying again. A deal has been signed with the multinational under which it will conduct a year-long study to see how best to develop the three fields – Cashiari, Miapaya and San Martin. Together these hold an estimated 17 Tcf of gas and 850 million bbl of condensate. The original $1.3-billion 1988 plan largely foundered because of the lack of incentives in the petroleum and tax regimes. Now these obstacles have been swept aside. But whether the new plan will be along similar lines to that scrapped earlier remains to be seen.
The size of the Camisea fields is such that Shell originally reckoned that only the Lima area could absorb the volumes dictated by economic production. This would have meant a pipeline across the Andes, gas initially being used for power generation. Later, local distribution would be developed for industrial and domestic consumers. The cost meant that, at oil prices less than $18/bbl, gas could not be priced to show a profit. Local authorities in the producing area wanted local gas use, both for industry and for power generation. But the volumes involved and the missing link in the national electricity grid meant that that scheme too came to nothing.

If the electricity grids can be linked, Camisea could make a sizeable contribution, at lower cost than piping gas to Lima. Aguaytia shows the way, on a much smaller scale. Now Shell, the government and the local provincial authorities all seem to be working towards a common goal. The hope is that Perupetro and Shell can sign a definitive development deal by the end of 1995.

Others planning sizeable investment in the wake of the new, more attractive, laws include the country's oldest and largest private operator, Occidental. The company early last year took up a new six-year concession over 880,000 hectares in the Amazon Basin, committing $34 million to exploration. Elsewhere, on its Capahuari Sul field, Oxy is to spend $40 million on water injection and new horizontal well completions. The aim is to boost recovery by some 30 million bbl. Latest Oxy move is the takeover of Petroperu's Block VI on the North coast. Under the deal negotiated with Perupetro, the US company will spend around $35 million in the first three years, installing waterfloods and drilling 30 infill wells on fields currently producing just 2,000 b/d.

Also active is Sapet Development, a US-based subsidiary of China National Petroleum Corp. Towards the end of 1993, it acquired rights to Block VII, where 3,312 wells have been drilled over the past 98 years. Today, just 257 produce a meagre 920 b/d oil and 681,000 cfd gas. Sapet is committed to spending at least $25 million over the next five years, including the drilling of 60 new wells and the installation of secondary-recovery systems. A similar deal sees local firm Rio Bravo and American International Petroleum reactivating fields in Block IV, where output currently totals just 500b/d. New seismic will be run this year and three wells drilled.

Another three holes must go down by mid-1996.

Newly-liberated Russian firms are also getting in on the act, working with local companies. Soyuzkarta is conducting seismic for Grana & Montero on Block V and has done similar work for Petro Andes of Block S-2. The latter will be drilled this year under a deal with Yuganskneftegaz , which will carry costs. A similar arrangement is likely on neighbouring Block S-3, also held by Petro Andes.

Downstream to follow suit

With much of this resurgence in upstream activity coming just on the anticipation of new laws, the pace can be expected to increase now those laws are in place. Downstream, matters are slower, partly because monopoly has yet to be broken. But even there some moves have come prior to the legal change. Last year saw Petroperu making spare capacity at La Pampilla available to outsiders, though at that stage nobody was prepared to enter local products distribution because of the unattractive proposition. Under the La Pampilla deal, 20,000 b/d of capacity was made available to Marc Rich, with the processing cost set at $1/bbl. Middle distillates go to Petroperu at world prices, RIch taking heavier products for sale thorough its own network outside Peru.

A little earlier, the government has tried to sell the 6,7000-b/d Conchan refinery, initially for $8.3 million. Only one bidder appeared but was not prepared to pay the reserve price, which was then cut to $6.8 million. That was still $0.5 million above what was bid. Conchan remains state owned. But now that the new legislation is in place, further sell-off efforts can be expected shortly. This time both the expected price and the potential market should be far more attractive.

On the move – road transport innovations

By Carol Reader

Third-party distribution by road is on the increase but the volume of this business contracted out to third parties varies from product to product. For bitumen, LPG and lubricants, distribution has nearly all been contracted out but for white fuels, distribution by third parties has only recently taken off. At the same time new technologies are bringing cheaper costs and better control.

The reason for the change lies principally with oil companies having to look at all their costs and increasingly turning to outsourcing as a means to this end. In addition, the rapid growth of petrol retailing by super/hypermarkets and the consequent market pressures have led in the same direction. 'The optimum fleet for an effective distribution solution with the lowest possible cost is the challenge that third-party contractors face from the fuel industry', according to Adrian Best, General Manager, Sales, Wincanton Transport.

In the past this third-party distribution was employed for specialist products or catered for fluctuations in demand created by seasonal factors but now with tighter margins and more timely information showing what is or is not competitive, marketers are looking more and more to outsourcing. The adoption of sophisticated information technology techniques now enables information on all distribution costs to be filed, stored and analysed with ease and very quickly.

Oil companies have already done much to rationalise distribution networks – closing terminals, buying and selling retail outlets and negotiating swap distribution arrangements with their competitors – even operating terminals jointly. The means and costs of supplying product to a service station is now vital, with oil companies reviewing the whole pattern of their service station network.

According to Neil Ripley, Director of Petroleum, Tankfreight Limited, one of the principal road tanker operators, mileage from terminal to customer is, surprisingly, on the increase but this has proved to be a cheaper option than keeping a terminal open.

Mr Ripley told Petroleum Review that companies like his had the resources and the flexibility to respond to the varying patterns of secondary distribution of petroleum products, to seasonal variations and fluctuations in volumes. In his view, third parties can respond more easily to these variations than an oil company can.

Likely benefits

The traditional benefits of outsourcing still exist – the release of capital and the re-direction of capital to other priority sectors.

Nowadays, however, outsourcing brings more consistent operating costs; it enables oil companies to re-focus on core activities and gives an opportunity to move away from existing restrictive practices. It brings flexibility and benefits from a wider spread and operation of resources. For instance, tractor units belonging to the road transport operator can be used for the trailer units of any industry, while drivers can be trained to be multi-skilled.

Tankfreight, for example, shows what is possible from this flexibility of operation. It has successfully integrated the distribution requirements of its bitumen and LPG businesses because they are complementary, being concentrated in different seasons.

The independent tanker operator is also able to bring his experience from other industries to the benefit of its oil industry customer. From current deliberations, one would imagine that on-board computers in the cabs of petrol-carrying road tankers were a revolutionary innovation. Far from it – tankers which collect milk from farms all round Britain have had them for some time. Oil companies, on the other hand, are currently only evaluating and trialling models from different suppliers.

The main advantage of using third-party distribution, provided by companies such as Linkman, Wincanton, P & O Roadtanks and Tankfreight, lies in the ever-increasing use of information technology and all its ramifications. These operators are in a position to know and use the IT technology currently being developed in all related industries and to be able to pick the best for their own use. Management information and costs can be analysed in a thousand and one different ways. Ordering, loading, routes and paperwork becomes so much easier. Moreover, these technologies have yet to reach their limit - improvements are taking place all the time in a range of industries and the tanker operators are in a position to benefit.

Computers in cabs

It is generally accepted that computers in cabs are now the way forward for truck management, instead of or as well as mobile telephones. Michael Conway, Sales Manager of George Meller Ltd which fits out new road tankers, describes the innovative computer as 'simplicity itself' and a cheaper option.

It will provide a direct link back to base and can be arranged to interface with any computer system in the controlling office. Information relating to cargo, volumes and tanks can be put onto a 'smart' card for loading into the computer. Routes and alternative routes can also be available on the computer as well as driver and vehicle records. After delivery has taken place, the driver can print out a customer delivery note or invoice or both. Moreover, the latest development means that the customer can even pay – with a 'switch' card facility. When the tanker driver returns to his base, all his information can be

downloaded to a central database from his cab computer via the smart card.

Computer systems such as these which 'move the office infrastructure into the cab' are currently being evaluated by oil companies in the United Kingdom. Gulf at Milford Haven, for instance, is currently carrying out a three-month pilot study of computers from four different suppliers.

For its part, Wincanton Transport has carried out trials over the past 18 months and is now fitting on-board computers with a vehicle management system called VEMIS to 400 of its vehicles. Benefits are reported to include fuel savings of 8-12 percent, improvements to driving techniques and a longer life-cycle for vehicles.

What of the future? Shall we see 44-tonne vehicles, with 24-hour loading and 24-hour delivery using driver controlled deliveries? Shall we see 'sealed parcel' deliveries? Shall we see 'electronic sniffing' to provide cross-over protection? Such ways and means may not be in use now but they might be round the next corner.

A cab computer in use

Satellite tracking

Communications, we are told, are vital. Now, based on Global Positioning System, which can pinpoint locations with uncanny accuracy, comes satellite tracking for road transport vehicles. We are told that the system can locate a vehicle to the nearest 500 metres. From dishes fixed on tankers, for instance, messages are sent via a satellite positioned over Malta, back to the host computer in the tanker operator's head office, regional emergency control room or wherever.

This research is being carried out by a consortium of companies and organisations under the FRAME project – Freight Management in Europe. Partners include academic institutions (Imperial College and the University of Ulster), the Welsh Office, transport companies such as Tankfreight, P & O and Maersk Line, transport consultants WS Atkins and information system specialists such as INTIS and INET.

FRAME aims to develop a sophisticated system for the monitoring and control of hazardous goods freight transport on European roads. With the ever-increasing growth of European traffic and the new liberalisation encouraging the free exchange of goods across borders with minimum administrative control, a pan-European management system looked desirable. In addition, mounting public concern over road safety and environmental issues needed to be met.

Under the FRAME project, co-operation is taking place between civil administrations and freight operators, in the interest of reducing accidents and incidents involving hazardous cargoes. It covers all of Europe with the exception of Albania and Norway.

The FRAME system comprises three elements:

- Automatic location of vehicles
- Communication systems between vehicles and traffic control systems
- Management, processing and presentation of information.

In order to pinpoint vehicle locations, satellite positioning will be used – any vehicle equipped with the relevant disk can be tracked and accurately located. To date, research has showed that vehicles can be kept in touch except in tunnels, while the shadow of buildings causes a slight problem. In such instances, roadside monitors will be used to ensure constant surveillance.

Information concerning the vehicle, driver, cargo and planned route can be fed into the computer system. This will enable freight operators to locate and track down their vehicles at any time – to transmit commercial instructions, change of route, accident warnings or whatever.

Civil administrations, especially the emergency services, see themselves benefiting from this new technology – knowing when and where hazardous cargoes are in their area and communicating in the event of an incident.

This innovative system is currently undergoing trials throughout Europe. One trial involves the route from Rotterdam to Athens via Italy and the other from Rotterdam to Hull, Holyhead and across the Irish Sea to Dublin.

H & S Transport, a P & O Roadtanks subsidiary, has fitted eight of its tankers with these satellite tracking facilities, in order to try them out. Marcel Mosterd of H & S told Petroleum Review that his company was now considering installing the novel system in all their trucks operating in Europe.

Tankfreight is also taking part in the trials with four of its Cardiff-based vehicles which have been linked up to the company's control centre as well as to Gwynedd police. Neil Ripley, Director of Petroleum, Tankfreight Limited, sees the system as more suitable for moving very hazardous cargoes across Europe than for day-to-day UK operations.

Adrian Best, General Manager, Sales, Wincanton Transport, is not so enthusiastic as others. He commented, 'Many have argued that satellite tracking will be the future for improving fleet management and vehicle utilisation. True it can inform us where the product/tanker is and approximately when it is going to arrive at a said destination and maybe a few other fringe benefits. But do we need to know this via an ultra modern tracking satellite system? Quite simply, I believe the answer to be 'No''.

THOMAS the roadtanker

Linkman's THOMAS with Sainsbury livery

Today's THOMAS is not yet another spin-off from the Rev W Audry's highly successful series of children's books. Rather, it is a life-size state-of-the-art road tanker, designed and built by Hockney Pty Ltd in Australia.

Launched onto the UK market last year at TankCon in Blackpool, THOMAS stands for Tank Having Optimum Mass and Stability – its main innovative features. Following a series of severe road accidents in its home country, manufacturer Hockney, based in New South Wales, had set out to find a safer, more stable tanker than past conventional designs.

In due course the designers came up with a lightweight tank which had a centre of gravity 240 mm lower than before, with an increased payload of 47,000 litres.

From a successful launch in Australia, various differing models of THOMAS can now be found on the roads of 10 countries and, according to Hockney's Geoff Stewart, this number is still increasing as their reputation spreads.

After the first one in the United Kingdom appeared in the Linkman livery last year, other companies followed.

The most recent THOMAS model was designed and built for P&O Roadtanks to conform with ADR, the European Agreement Concerning the International Carriage of Dangerous Goods by Road. These are the first ADR-approved THOMAS trailers entering service with a UK operator. They will be able to work anywhere in Europe, anticipating a time when European design standards will be adopted by the UK regulatory authorities.

This new trailer unit has a 6,700 kg tare weight and a 40,400 litre capacity, divided between six individual tank compartments. Built almost entirely of aluminium, a payload improvement of at least 2 tonnes is possible, compared with conventional tankers. Other features include air bag suspension and a new double depth hose trough arrangement.

The entire tank shell, made of extruded aluminium, is nested within a strengthening cage designed to absorb roll-over impact. It also has front and rear crash crumple zones.

Modern technology on these tankers includes bottom loading and vapour collection equipment, manufactured by Senning of Hamburg.

Described as the 'world's safest tanker design', THOMAS is being adopted both by oil companies and tanker fleet operators in the United Kingdom. Operators are delighted to achieve cost reduction with the new tankers. A substantial 20 percent reduction in aerodynamic drag brings fuel savings of 8-12 percent.

Hockney's aim in its THOMAS design was to find a safer mode of dangerous goods transport. In fact the design includes a number of transport safety features. The main selling point is its low profile, which the company claims makes it 40-50 percent less likely to roll over than conventional tankers. Such an improvement gives the tanker driver a higher margin of safety.

P&O Roadtanks' THOMAS

Tankfreight's conventional road tanker

Making tracks

By Susannah Cardy

What does the future hold for British Rail's petroleum freight business? Some customers, shocked by the drastic price rises of two years ago, believe its prospects look grim. The new freight companies, on the other hand, look back at 1992 as the beginning of a new, more profitable era for rail - the light at the end of the tunnel.

Above: The Furzebrook-Hallen Marsh LPG train passes South Moreton

British Rail has never had an easy time of it when it comes to freight. Its peak year was in 1970 when almost a quarter of the petroleum products moving around the country went by train. Since then several fairly inexorable economic trends have combined to whittle down the role of the railways so that they now account for just 15 percent of the market.

'We've had to compete with every mode of transport bar hot air balloons,' explained Mr Chris Pendlenton of Mainline Freight, one of the three stand-alone companies established as part of the progressive transfer of BR's freight business into the private sector. With the advent of major road and motoway building schemes over the years and the development of 38-tonne tankers, road transport has become a more and more attractive proposition.

Pipelines, meanwhile, have nearly always won hands down when it comes to the transportation of large volumes of oil to major nodes of use. Coastal shipping has also taken its toll on rail freight, particularly around Scotland. And then there are exchanges. 'The exchange game has become more and more competitive,' according to Mr Pendlenton. BP and Esso, which have refineries at either end of the country, are particularly involved in this cost-saving exercise. 'There isn't a gallon of Esso petrol to be had in Scotland now,' according to one industry source.

The railways have also been badly affected by the

decline of middle-sized terminals, squeezed out by increasingly stringent environmental legislation. 'It was these terminals that were typically supplied by rail,' said Mr Pendlenton.

Shocked customers

Add to all this a decline in coal tonnage, together with the virtual abolition of cross-subsidisation within BR, and it is not surprising that the railways had to raise their prices when long-term contracts came up for renegotiation in the winter of 1992. What did shock customers, however, was the aggressiveness of the new pricing policy. BR quoted increases of between 50 and 100 percent on some of its less profitable routes. Shell and BP reacted by taking significant chunks of their business elsewhere. Shell switched certain locations from rail to road feeding, including the Shell Haven refinery and some routes out of Stanlow. BP switched 25 percent of its rail tonnage on to the roads. In all, its tonnage has dropped from 970,000 in 1992 to approximately 680,000 this year. 'We got the feeling that BR was trying to price itself out of the market on certain lines,' said a spokesman.

'We've had to compete with every mode of transport bar hot air balloons'

British Rail has never actually denied this. 'We had to overhaul our economics and that involved coming out of certain areas of business,' said Mr Pendlenton. 'So, yes, the price propositions were pretty outrageous sounding but some customers prefer to be offered a price than simply being told "we're off"!'

The rail freight companies firmly deny that 1992 was a low point for freight. In many ways, it was precisely the opposite. '1992 was the culmination of a seven-year process during which we moved the business away from stagnation and into growth,' explained Mr Pendlenton. 'We were no longer prepared to cross-subsidise those small parcels of business that didn't make any money. Instead, we moved into the primary distribution of major flows with its low unit costs and high volumes.'

'Many of us have spent our entire careers waiting for the government to curb road traffic and one tends to get very sceptical'

The well-publicised price rises of 1992 actually followed a period of corresponding price reductions for some major flow routes, say the rail freight companies. These price reductions were, in turn, made possible by the introduction of the new Class 60 locomotive which ran on 300,500 horsepower and effectively doubled the size of freight trains. As a result, a vital area of business with Total, covering the movement of large flows between the north east and Langley, was retained in the face of competition from a new Fina pipeline.

British Rail also attracted *new* business in the shake-up of 1992. It took on a new route from Murco which runs between Milford Haven and the new Westerleigh terminal serving Avon. New business was also won from Petrofina between Immingham and Sunderland in the face of strong competition from coastal shipping. Conoco later joined Fina in this transfer of major volume from sea to rail.

Britain's new rail freight businesses – Mainline Freight, Loadhaul and Transrail – believe their slim-lined portfolios are now far more realistic. Mainline, which covers the south-east, is particularly keen on developing niche markets. As pipelines take over more and more of the white oil market, the company is increasingly turning to the upper and lower levels of the barrel. It regularly carries LPG from the Fawley refinery, on the south coast, to Plymouth and the north-east. At the other end of the spectrum, although a sizeable volume of the bitumen market has been lost at Stanlow, Mainline still carries a steady flow of bitumen out of both Fawley and Lindsey in Humberside. Crude oil is viewed as another niche area. 'We're already involved in Hampshire and if ever onshore exploration got going again, we would have a proven product for handling that business,' said Mr Pendlenton. 'We are currently pitching for the Stockbridge field.' The removal of condensates from Wytch Farm and North Walsham is another important specialist area of business.

The freight companies also predict that a recovery in the UK economy will bring with it extra business. In the boom period of the late 1980s, Britain experienced a significant increase in the demand for motor gasoline and jet fuel which left its pipelines congested. The railways, in turn, became involved in lifting the surplus volumes. Since then, demand has fallen back to within the capacity of the pipeline system but an end to the recession should result in a second volume surge and another chance for the railways to provide this extra capacity.

In short, the rail freight companies have adapted to a very difficult market but are they simply clutching at straws? After all, Britain is now geared firmly around its road infrastructure and relatively few end-customers have rail-receipt facilities anymore. Yet, Mr Pendlenton insists he is more positive now than he has been for the past three years. One reason for this is the recent call for a wholesale review of Britain's transport policy by the Royal Commission on Environmental Pollution. 'Every time this issue is raised we get closer to the day when something will have to be done about it.' At the same time, he is realistic about the chances of a major initiative ever emerging out of all the talk. 'Many of us have spent our entire careers waiting for the government to curb road traffic and one tends to get very sceptical. It involves such a major shift of emphasis against a background of very, very long-run and entrenched interests.' Nevertheless, he takes comfort from the fact that even the smallest reduction in road haulage would have a major impact on the railways. 'Five percent off road, for example, could mean as much as 50 percent on rail.'

One-stop shopping

If a serious curb on the motor vehicle is still something of a pipe-dream, privatisation is most defi-

nitely not. No date has been set and buyers have yet to be found but the three freight companies are due to be vested early next year. Feelings towards privatisation within the industry are mixed. There is concern that it will produce a fixation upon cash and short-term profitability, inhibiting the longer-term view. Maximising the shareholder's return may well result in a further reduction in the volume of freight in order to concentrate on selective, high-profit operations.

Mr Pendlenton questions how much difference it will make to competition. 'Privatisation will certainly sharpen our focus on costs but rail freight has always faced a unique range of competition from other modes of transport. We've never lacked the incentive to try to get our prices as cheap as possible.' One possible benefit, however, could be greater flexibility in the way the businesses are run. Mainline hopes to offer customers a complete logistical package in the future. 'Traditionally, the oil companies have had to maintain their own wagons and organise repairs. We would like to relieve them of all that and offer a complete one-stop shopping facility for rail haulage.'

With or without privatisation, the freight companies believe they are more competitive today than ever before. 'We are attacking the market with determination and a fresh mind,' according to Mr Pendlenton. Single-manned trains, better staff logistics and faster turnaround times for trains are all part of a drive to improve productivity.

Turning the clock back

One hope for the future is that the rail freight companies may be able to woo back some of their lost custom. 'If the oil companies are interested, we would very much hope to re-examine some of the businesses that we had to walk away from two years ago,' said Mr Pendlenton. The oil companies have responded to this suggestion with caution but are prepared to keep an open mind.

''We hope to re-examine some of the businesses that we had to walk away from'

'While the newly-formed rail freight operator now serving our downstream business has shown a more realistic attitude towards pricing, rates would have to reduce very significantly before there was any chance of a significant switch back to rail,' said a Shell spokeswoman. 'However, we continue to keep the situation under review and would welcome the opportunity to make greater use of dedicated rail delivery assets should this become economic.' A BP spokesman said everything depended on what offers the railways could come up with. 'Where the economics are right for rail, we'll use it.'....The challenge is on!

'The Komi spill was not an isolated incident'

By Justin Dye and John Patterson, Environmental Auditors, ERM

In October 1994 reports began to filter through of a major oil spill in the far north of Russia, near the Arctic circle. The spill had occurred from a rupture in a pipeline carrying oil from the Komi Republic to refineries in central Russia. Reports indicated that, rather than stop operation of the pipeline Komineft, the Russian state oil company, retained the gathering oil in an earth dam which was subsequently washed away during the autumn rains. The contents of the dam were released, threatening the valuable salmon runs and fisheries of the Pechora River and ultimately the Barents Sea. The consequences of the spill are still being assessed. However, it is clearly one of the biggest ever recorded.

But the Komi spill was not an isolated incident. Russia's Ministry for Civil Defence, Emergency Situations and Elimination of Natural Calamities recorded an official total of 32 major pipeline accidents in 1993. Russia alone has over one and a half million kilometres of oil and gas pipelines, much of which is in extremely poor condition, and the loss of oil is accepted as necessary in order to maintain production levels (and hence income). Estimates vary as to the amount of oil lost from Russia's pipeline system. However it is commonly accepted that figures of 10-20 percent per year are realistic.

Existing data shows that the states of the former USSR (mainly Russia, Kazakhstan, Azerbaijan and Turkmenistan) may well have the largest oil and gas reserves in the world. Only a fraction of them are currently being exploited, with new finds in the future a strong possibility.

Russian risks

In this respect, the break-up of the USSR has presented oil companies and investors with a number of new business opportunities. In short, if multinational companies want to target the region, they have two main choices: they can enter into partnerships with existing operators or conduct exploratory drilling operations of their own. With business opportunities however, come risks. It does not require a much publicised oil spill to alert companies to some of the problems associated with historically low operating standards, lack of investment and maintenance and a rapidly changing political and regulatory environment.

These can include a poorly maintained distribution infrastructure which, though beyond their immediate control, could seriously damage a company's reputation in the event of a major accident. At least if an operator has undertaken all the appropriate risk minimisation measures, there is less chance of being subject to operational censure - even if serious damage from a spill results.

Environmental audits

The issues highlighted by a due diligence environmental audit will inevitably vary according to the nature of the facility - although certain standard procedures will need to be followed. ERM has recently carried out environmental, health and safety audits of two concessions in Turkmenistan, one of which is already in production, while exploration drilling is being conducted at the other. In many areas of the country large volumes of seismic data can now be obtained and proof drilling can be conducted. In this instance, the client had reprocessed and interpreted over 2,800 miles of existing seismic lines and acquired 560 miles of new data. Large volumes of data can now be obtained in many parts of the country before going on to carry out proof drilling.

Companies wishing to take a stake in the CIS oil business face three main environmental concerns: the need to establish criteria for carrying out an environmental impact assessment (EIA); the prospect of hidden environmental risks and liabilities and the often inhospitable nature of the region's climate which can hinder progress and contribute to the hazards of exploration activities.

However remote the region, EIAs have become standard practice for oil and gas developments on 'green field' sites. Increasingly the EIA is included as an integral element in the design of a new facility and will help determine such factors as baseline conditions, the sensitivity of the site, risk analysis and emergency procedures. Concerns are therefore addressed at the earliest possible stage, with appropriate procedures incorporated into the design and operational plans.

Areas of concern

For those seeking to enter joint venture partnerships in existing facilities, the due diligence audit has become an important tool for assessing potential liabilities and the remedial measures required. The principal areas of potential concern that need to be identified include:

- Historical operations and their impact on ground and groundwater contamination;
- Existing equipment and operations, their potential to impact the surrounding area and associated up-grade/replacement requirements;
- The sensitivity of the area;
- An EIA of the required upgrade and new infrastructure;

- An understanding of the legislative requirements of the area and therefore the potential remediation costs and applicable standards.

The nature of environmental and climatic conditions in the CIS means that an operator may be faced with a variety of local or regional environmental problems (eg the Caspian Sea). These conditions have major implications on the way facilities are operated and on the implementation of emergency response procedures.

Take the Russian oil contamination which has been in the news. These days immediate news can be sent down the wire from the most remote of regions but it is another matter trying to co-ordinate an effective clean-up operation with modern equipment and appropriately trained personnel. Any operator planning an operation in the region must be aware that a global audience may expect immediate action following a spill however inhospitable the location. The remoteness of the operation and the extremes of climatic conditions are therefore both factors to consider when assessing the viability of operations in the region.

This proved to be the case when ERM reviewed facilities on behalf of a client in Turkmenistan where temperatures range from -50°C in the winter to +50°C in the summer. During the winter months, pipeline oil leaks, even if they are detected, cannot be repaired until summer. Once it starts, oil can leak continually for months, making the task of eventual repair and clean-up a difficult one. The due diligence audit should help to assess both the potential for such leaks and their significance to the operation should an incident occur. What's more, a detailed knowledge of the environmental setting of a target site can provide both oil company and its bankers with key information on the potential risks associated with using particular facilities, equipment or operations.

In some less sensitive areas there may be less urgency about the risk of a spill and the damage which may result from it. In addition to a site's location and the degree of sensitivity, this may also depend on the scope for oil reclamation and remediation - all of which should be examined as part of the due diligence audit.

Leaks and spills may to some extent be naturally contained by the soil type, oil pour point and temperature. In other areas releases of oil may pose significant risks to surface and groundwater resources or could damage sensitive ecosystems and wildlife habitats (for example in the extensive oil developments of Western Siberia).

Environmental impact

Although major leaks and spills of oil are the most frequently reported and perhaps most visible form of environmental damage, other aspects of on-going production activities can present significant environmental impacts. The disposal of produced water for example has in many areas been conducted with little regard to environmental effects. A thorough assessment of the environmental setting is necessary in order to evaluate the potential risks and liabilities faced by the investor.

Apart from these direct environmental implications for companies entering the CIS, other factors are increasingly coming into play. This is particularly true of areas where companies are primary or sole users of equipment owned and operated by national bodies. This may include pipelines, terminals and even refineries.

Usinsk oil spill
PHOTO BY
KATZ PICTURES

Standards required

Where the multi-national investor may be the majority or even sole user of such facilities, the local authorities will increasingly hold them responsible for contamination and any remediation costs. This is not only true for ongoing contamination but also may be the case for historical contamination. By and large oil companies are expected to have the financial clout and established procedures to set new standards in environmental management.

Increasingly, therefore, environmental due diligence audits are being used to review CIS facilities that are not directly owned or operated by the international oil companies. In many cases, the scope of these audits has been broadened to identify areas of existing and potential liability as well as the costs and measures needed to ensure environmental risks are kept to an absolute minimum.

This was the case in a recent ERM audit of facilities in the Caspian Sea area where the principal findings and potential liabilities concerned the operation and condition of facilities not directly under the client's control. The client's consortium was the majority user of a terminal and off-loading pier in the Caspian Sea owned and operated by the state body. The due diligence audit highlighted concerns over the operation of the terminal and the off-loading pier

and the potential for significant contamination of the Caspian Sea. Recommendations for the supply of emergency spill control equipment were among the priorities highlighted in our report.

Other important factors to consider as part of the due diligence process may include the remediation of land already contaminated, the requirement for the upgrade of pipelines, leak detection systems, or emergency response equipment in order to limit the potential for environmental impact of the operations. In a number of cases the audit findings will lead to negotiations with the relevant authority or company prior to investment. These negotiations may stipulate the need for certain improvements, the cost of which has to be offset against the purchase price.

Companies turning to an international finance group or donor agency to help fund their proposed investment in the region may be required to carry out a due diligence audit and/or EIA as part of the loan agreement. This is largely due to the historical problems associated with particular loans, some of which have resulted in serious damage to the environment. No financial institution wants a promising joint venture it is helping to fund holed because some of the more glaring environmental risks have not been taken into account. By the same token, banks and insurance companies will be as concerned as the oil companies to avoid the stigma of bad publicity in the event of a major accident.

All parties with a financial stake will want a clear priority list of potential hazards. Allocation of resources can then be targeted for operations under the control of the company and pressure can be bought on the third parties to upgrade in specifically identified areas.

Operators in the former USSR are faced with a rapidly changing political and regulatory environment. Individual states which had formerly operated under a single regulatory system are now developing their own legislation, while enforcement of existing environmental laws which has historically been minimal, shows signs of becoming more effective in the future. If the CIS is to enjoy a future oil boom, then on this occasion the region will be expected to demonstrate all due respect for the environment.

Fact File

- **During 50 years of oil exploration in the CIS most of the oil has been extracted from Siberia and a belt around the Caspian Sea.**
- **A single company's operation can produce upwards of 4 million tonnes of polluted water a year.**
- **Drilling operations produce about 40,000 cubic metres of oily waste per well.**
- **The company, Noyabr'skeftgas, claims that the 300 million tonnes of oil so far extracted from its territory represents only about 4 percent of reserves.**

Is the Caspian a lake or a sea?

By Christopher Pala in Almaty

Existing international law backs the position of Kazakhstan, Azerbaijan and Turkmenistan that they have the exclusive right to develop the underwater oilfields off their respective shores, according to Kazakhstan's Deputy Foreign Minister, Vyacheslav Gizzatov.

Russia is opposing plans for an international consortium to start exploratory drilling on the continental shelf off Kazakhstan, site of one of the world's biggest oilfields.

Russia, which has no oil on its northern coastline of the Caspian, is backed by Iran in arguing that the sea should be considered a lake and all Caspian states must first agree on all measures that could pollute the shallow body of water, such as drilling for oil.

In a long interview, Mr Gizzatov told *Petroleum Review* that whether the Caspian is considered a sea or a lake makes no difference: in both cases, 'Existing international law gives control of underwater resources to the countries on the shore.'

In the case of lakes, the border is drawn on the median line. In seas, there is a 12-mile territorial waters zone followed by a 200-mile economic-rights zone. 'But the Caspian is so small that it is only wider than 400 miles in the south, in waters that are already agreed to be Iranian,' he said. 'There is no oil there anyway.'

Furthermore, UN laws on continental shelves specify economic sovereignty of the shore nations, he said. 'On this whole question, there is no difference in the positions of Kazakhstan, Azerbaijan and Turkmenistan,' he said.

'Existing international law gives control of underwater resources to the countries on the shore'

At the last round of talks on the Caspian which were held in Moscow in October, Russia brushed aside a Kazakh proposal on the legal status of the sea and backed an Iranian proposal – the only one that was discussed.

That proposal gave equal rights to all Caspian states to develop the resources of the entire sea which, Mr Gizzatov said, would give an advantage to Russia because of its huge financial resources. The Iranian proposal also requires unanimous agreement on bringing in non-governmental organisations – including oil companies – to develop underwater resources.

Mr Gizzatov denounced as spurious the Russian argument that existing treaties between the Soviet Union and Iran, signed in 1921 and 1940, are relevant to the issue. 'These treaties say nothing about the legal status of the Caspian,' he said. 'They only mark the border with Iran and deal with fishing and shipping.'

He said international law guarantees access to markets and therefore Russia is obligated to let the other Caspian states use the Volga-Don canal linking the Caspian with the Black Sea. He added that the Soviet Union never allowed Iran to use the canal.

'That proposal gave equal rights to all Caspian states to develop the resources of the entire sea'

Mr Gizzatov called 'uncivilised behaviour' a position paper that Russia circulated in October at the United Nations in which he said Moscow reserved the right to take 'appropriate measures' against Caspian states which unilaterally allow exploration on the Caspian sea-bed.

'This is superpower behaviour,' he said. 'Russia wants to retain control of all oil production and transportation in all of the former Soviet Union.'

Russian muscle-flexing

Asked if the Caspian Shelf Consortium (AGIP, BP-Statoil, British Gas, Mobil, Shell and Total) was worried about Russian muscle-flexing, Mr Gizzatov said, 'Of course they're worried but they and us believe that the principles of international law will have to prevail. Still, we can't just ignore such a powerful state as Russia.'

He stressed that Russia was welcome to join in the exploration and exploitation of the Caspian Shelf fields 'but on the same footing as everyone else, not with special terms that would be at the expense of our own interests.'

'We need the moral and political support of the world community,' he said. 'And we are ready to accept international supervision of the drilling in the shelf as far as pollution is concerned, though the consortium has assured us that there will be no damage and we believe them'.

Guidelines for the uplift of product from retail filling stations and customer tanks

By K G F Melville, consultant

The uplift of product from retail filling stations and customer tanks is the subject of new IP Guide Notes to be published this month. Some of our readers may well say, not before time! To others will fall the question, well what's it all about?

The IP Safety Sub-Committee has for some time now been concerned at the diversity of methods, the range of equipment and the experience necessary to overcome the logistics and sheer practical applications of recovering product from both underground and above ground tankage.

The industry has been under a fairly intensive de-manning pressure since 1984 in order to maintain an economic and efficient service to the customer as well as to ensure the survival of individual companies in times of increasing competition, exacerbated by the recession. In the process, as the employee age profile decreases, there has been a considerable loss of experience and with fewer people employed in storage installations, there is a growing gap in the industry capability to deal with the needs for product uplift when the occasion arises. This is putting a strain on limited resources and has already caused some companies to examine the possibilities for contracting out the response, while others consider whether or not they have enough personnel sufficiently well trained to accomplish the task, thereby maintaining their service integrity.

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The need

The reasons or causes by which the need arises are multifarious — ranging from a straight forward delivery crossover where two products are accidentally inserted into the wrong tankage, causing cross contamination, to the need to 'bottom' tanks in order to allow repairs or renovation, modification or replacement.

Gone are the days when we would send out a van with two or three men and a rotary bilge pump of the type used on lifeboats and operated by a reciprocating lever. In many cases, due to an emergency, speed is of the essence, consequently the equipment being used now will most likely be either diesel, air or hydraulic powered and mounted in its own purpose-built trailer carrying a wider range of accessories to meet any eventuality.

Installation implications

While there are still many older and simpler designs of installation to be encountered, particularly on commercial customer premises, in modern filling stations new regulations are forcing the introduction of advanced technology to cope with the balanced transfer of vapour at the time of delivery. Overspill prevention devices, offset fill pipes, pressure and vacuum valves on vent pipes, manifolded vent pipes, flame arrestors, manifolded tank groups either above or below ground, leak detection equipment, glass fibre reinforced plastic tanks, all bring their own problems to be recognised and resolved.

It is questionable as to how much understanding licensees and proprietors have of the technical complexity in modern installations. Indeed one could say that provided they follow the Dangerous Substances (Conveyance by Road in Road Tankers and Tank Containers) Regulations 1992, schedule 4, then the problems should not arise.

But they do – sometimes because of equipment failure, sometimes as a result of human failure; for example, occasionally as a consequence of poor off-take monitoring or trying to squeeze a quart into a pint pot in a pre-budget tank fill.

Legislation, guidance and training

The Health and Safety Executive booklet HS(G)41 *inter alia* draws attention to Hazardous Area Classification and the zones within which special precautions must be taken to prevent sources of ignition reaching flammable atmospheres. The regulations, mentioned above and earlier, place an onus on the licensee to have a 'competent person' in attendance while a delivery is being made. Under the Health and Safety at Work Act 1974, the most senior manager on site at the workplace is ultimately responsible for the safety of the operations but how well are they trained or indeed experienced?

How well trained are the staff? Do they understand these regulations? What do they know about static electricity, about entry into confined spaces or Permit to Work systems? Does this give you an uneasy feeling? Are your contractors equally well-trained and to what standard? Have you training certificates available to verify? What do they know about protection devices on diesel engines? Where there has been a spill or leak, do they understand the requirement for environmental impact protection and the waste management regulations? What are the local authority requirements regarding site closure during uplift operations and who is responsible for obtaining permission to uplift? How often do you test the electrical continuity on vehicle motor spirit hoses?

Safe practice

In many cases when these incidents arise, the licensee or proprietor will rely on the supplying company to provide the recovery service, although sometimes there may be privately arranged repairs or modifica-

tions for which tank emptying and bottoming is required. In these latter examples, external specialist contractors may be employed. It is important that they are aware of the precautions which should be in place to ensure a safe working practice and evaluation of the potential hazards.

Site visits

Prior to the uplift, a visit to the site location should be arranged by the uplift organisation to assess the practicalities of access, equipment layout, requirements for specialist engineering and electrical advice, and to identify the presence of interconnected tankage so that syphoning of adjacent tanks can be eliminated. Electrical specialists will for example be able to advise on the implications of the protective multiple earthing system (PME) where the earthing of pumping uplift equipment is involved. Arrangements will be required for the eventual replenishment of product to the affected tankage and if the tank is to remain out of use for some time, it is likely that temporary partial filling with water may be required by the local Petroleum Officer, in order to ensure a liquid seal on the suction line.

Conclusions

This should have given you some food for thought. It is difficult to pass on experience at the best of times and when employee departures take place it is only after the event that we discover the need to reassess our response capability. Hence there is a need to capture the experience in documents such as the IP guidelines that are being published this month and to update them periodically. The guidelines have been compiled to do just that; indeed they contain useful procedural checklists and many technical or practical memory joggers.

Of course, there is always the fallback situation. Your procedures are up to date and already account for all of the features mentioned here. Oh! if only pigs could fly!

Get your copies now – you know it makes sense.

'It is questionable as to how much understanding licensees and proprietors have of the technical complexity in modern installations'

Acknowledgement

The author of this article wishes to acknowledge the sterling contributions of the working group members – Richard Dingle formerly of Shell UK Oil, Jim Turner of Esso Petroleum Ltd. and our indefatigable secretary, Mike Wood. In addition there were original contributions by Howard Cartledge of Esso Petroleum Ltd. and Ian Orr of BP Oil UK Ltd to whom we are indebted for their interest.

Gantry meter proving – a static problem?

(Safety forum held at the Institute 1 November 1994)

Gantry meter proving

The volume measurement of petroleum products that are loaded on road loading gantries for distribution to filling stations and customer premises is carried out by means of flowmeters. Since the metered quantity is used as the basis for invoicing for the product, the accuracy of the meter is of critical importance. Meters are checked by regular proving procedures, normally in the United Kingdom involving the use of 'reference meters'. These are meters calibrated on specific grades of product and traceable to national measurement standards. The gantry meter will then be adjusted, according to any measurement error relative to the reference meter, in order to keep it within the tight tolerances set by industry and aimed at ensuring that meter accuracy falls well within Weights and Measures regulatory requirements.

In the last three years, three safety-related incidents have occurred during the course of meter proving, despite the introduction of procedures intended to minimise the hazards. Two incidents have involved little more than a very mild explosive 'whoosh' in the compartment of the tanker receiving product during the meter proving run. However, the effect could have been far more severe had a more flammable atmosphere been present. Such an event occurred in December 1993 at BP Oil UK's Northampton Terminal and resulted in severe damage being sustained to loading gantries and a tanker, though fortunately without any personal injury. The cause of this, and other similar incidents, was suspected as ignition of a flammable atmosphere in the receiving tanker by means of a discharge of static electricity, though other ignition sources were possible.

Project Thor

As a result of the Northampton fire, BP set up a research project, Project Thor, to investigate meter proving safety and the events of the three incidents that had occurred. The project was jointly sponsored by BP, Texaco, Esso and Total. Following presentation of the conclusions of the work to the Health and Safety Executive (HSE) in October, a Meter Proving Safety Forum was held at the Institute on 1 November. This was attended by over 50 representatives from the oil industry, meter proving contractors and the HSE.

The Chairman, Alec O'Beirne, Manager of BP Oil UK's Operations Services, Distribution Division, and Chairman of the IP Marketing Engineering Committee, stressed at the outset that discussions would focus on gantry meter proving safety. Although the electrostatic hazards of tanker loading are closely related, they are being covered by new Guidelines on electrostatic hazards which will be drafted by the IP and should not divert attention from meter proving.

Presentations were made by Mr O'Beirne on the Northampton incident, by Nigel Jones (Texaco) on incidents at Texaco's Manchester terminal, and then by Nigel Jones, Peter Howells and Mike Nott (both BP) and Tom Ramsey (Esso, Chairman of the IP Electrical Committee) on Project Thor, its conclusions and the recommendations stemming from it. Jim Snook (consultant), Chairman of the Commercial Measurement Committee and of the IP Safety Working Group that is drafting new Meter Proving Safety Guidelines, outlined the work being carried out on the new Guidelines, which will be published next year.

Conclusions of Project Thor

The conclusions drawn from Project Thor are that:-

- The source of ignition in these meter proving incidents is most likely to have been electrostatic discharge
- Filters used to protect reference meters in proving rigs can generate hazardous levels of charge
- The charge-generating effect of filters is principally determined by their filtration efficiency and is relatively uninfluenced by earthing or use of metallic meshes
- The stop-start nature of proving does not reduce electrostatic potentials below those generated by continuous loading.
- Incendive discharges can occur from the fuel surface; this hazard is increased by the presence of conductive debris in the compartment (acting as a charge collector) that can be pushed to the surface by turbulence.

Safety procedures in meter proving

What procedures should therefore be taken to minimise the risks of the operation? Essentially there are three factors that have to come together before an ignition can occur:

(a) The presence of hydrocarbons at concentrations within the flammable range
(b) The presence of oxygen at levels sufficient to support combustion
(c) A source of ignition.

Consideration of meter proving operations leads to (b) being excluded as a practical control measure. Therefore attention needs to be focused on either (a) or (b), or both.

Firstly, it was emphasised that each site needs to be considered individually. In addition, different companies may evolve different solutions to the problem, depending on their expertise and the control procedures they operate. A risk assessment should be central to each technique when organisations are considering solutions they may adopt.

The prime and probably universal recommendation is to avoid the use of fine filters in meter proving rigs since they are major generators of static charge. Another possibility is to employ anti-electrostatic additives to increase the conductivity of the fuel and thereby reduce the charge build-up. However, the possible loss of additive effectiveness throughout the distribution system should be borne in mind and the need, as a consequence, to carry out conductivity measurements at various locations.

Another course of action is to employ dedicated tankers as 'dump vehicles' to receive the product during the proving of middle distillate meters. Such vehicles are maintained free from flammable vapours that can otherwise arise when the receiving vehicle has recently carried gasoline. This route, as a means of limiting the possibility of a flammable vapour being present, is recommended to organisations that may have restricted technical resources at their disposal. As a variant, procedures may be introduced for thoroughly removing flammable vapours before a vehicle is used in meter proving. However, this is not a simple option since removal is difficult. Such problems do not arise when proving gasoline meters since vapour concentrations are in the non-flammable (over-rich) range.

In conclusion, the incidents show that even careful companies need to be vigilant in their operational procedures. Given the right (or wrong) combination of circumstances, major incidents can still occur in what may be considered to be fairly routine operations. In the case of gantry meter proving, it is believed that implementation of the IP Meter Proving Safety Guidelines, incorporating the results from Project Thor, will assist in significantly reducing the hazards of the operation.

J M Wood, Technical Department

Code of Practice for Internal Floating Roofs for Oil Storage Tanks

This new Code of Practice specifies minimum requirements for the materials, design, construction, testing, operation and maintenance of internal floating roofs (IFR) for use in oil storage tanks containing volatile hydrocarbon products. It also specifies the design of related tank fittings. It is applicable to IFRs fitted to new tanks, those retrospectively fitted to existing tanks or removed from obsolete tanks and re-used elsewhere.

Internal floating roofs (IFRs) are also known as floating covers, floating blankets, floating decks or floating screens.

Internal floating roofs should not be confused with external floating roofs. External floating roofs (EFRs) float up and down within an open top tank on the surface of the product. EFRs are exposed to the weather, are designed to carry a heavy rain or snow loading and include provisions for the drainage of collected water. IFRs operate inside a fixed roof tank, are protected from the weather, and can therefore be of much lighter construction.

Internal floating roofs may be installed for any of the following reasons:

a) To reduce evaporative emissions e.g. breathing and filling losses and hence air pollution

b) To reduce ingress of airborne contaminants e.g. rainwater, sand and other solids into the product.

c) To minimise nuisance from odours.

d) To reduce hazards of static ignition associated with highly charged liquids.

e) To provide thermal insulation in fuel oil storage as an alternative to roof lagging. Special design considerations are involved for this application and they are not covered in this Code.

IFRs are also used in storage tanks containing other types of product such as chemicals, demineralised water, drinking water and effluent. Again special requirements will apply which are not covered in this Code and prospective users are advised to consult IFR suppliers before undertaking such installations.

IFRs are not normally installed in tanks smaller than 6 metre diameter because of the difficulty of fitting peripheral (rim) seals satisfactorily in tight tank shell curvatures i.e. tanks having an area/circumference ratio of less than 1.5 . There are no upper limits on tank diameter for the installation of an IFR. This Code therefore specifies requirements for IFR installations in tanks of 6 metre diameter and above.

The publication of this Code of Practice is most timely as it coincides with final agreement of the contents and wording of the European Directive on Volatile Organic Compounds (VOC) Emissions. The way is now clear for the provisions of this directive to be enacted into UK legislation during next year, enabling the implementation schedule to start at the beginning of 1996. From that date all new gasoline tanks will have to be equipped with emissions control and retrofitting of existing installations, where necessary, in three 3-year phases will start. Under Phase 1 all gasoline storage installations with an annual throughput of greater than 50,000 tonnes will have to be equipped, although it will not be necessary to install a vapour recovery unit unless the throughput exceeds 150,000 tonnes on road and rail loading combined. Under Phase 2 the threshold drops to 25,000 tonnes and under Phase 3 all remaining tanks will have to be fitted. Installing floating roofs will be a recognised means of complying with the legislation.

Geoff Dale of Subsea Offshore is 1994 UK Oil Industry Golf Champion

Geoff Dale of Subsea Offshore, based in Aberdeen, became the 1994 UK Oil Industry Golf Champion winning the title at The Belfry on 23 and 24 October.

This is the sixth year of the championship and 96 finalists enjoyed the excitement of a major competition on the famous Brabazon Course. Some 400 golfers had entered this year's championship, playing over fourteen qualifying rounds held throughout the country.

TECHNICAL REPORT

Exploration & Production

The Institute has provided secretariat services, under an agreement with BSI, to the PSE/17 committee and its subcommittees covering 'Materials, Equipment and Offshore Structures for the Petroleum and Natural Gas Industries'. The Institute was represented as part of the UK delegation to ISO/TC 67 and also attended a meeting of the AG 3 workgroup responsible for providing the planning and liaison necessary to accelerate the production of international standards.

WS Atkins have completed all their technical work on subsea equipment operating envelopes and the final report on the Routine and Non-Routine Cases is being compiled. This will shortly be available as a reference document in the IP Library. The draft Guideline Document has been issued for comment and it is hoped that the IP will publish this by the end of the year.

The Position Paper on the 'Safe Design of High Pressure Shell and Tube Heat Exchangers' has now been distributed and some comments received. A proposal to carry out further theoretical work to validate the computer modelling packages used to assess the safety aspect of heat exchangers, is being considered as part of the 1995 research budget.

Microbiology

A successful workshop on microbiological test methods was held at the University of Hertfordshire, Hatfield. The workshop was aimed at representatives from the oil industry and the users of petroleum products. The test equipment on display ranged from simple dip-slides to the most up-to-date techniques for detecting the presence of microbes. In addition test rigs which can be used to simulate pipeline and oil well environments for corrosion and microbial growth were on show.

Test Method Standardization

Modifications for the 1995 Petroleum Test Methods book have been collated and sent to John Wileys. The 1995 edition will include seven new full methods and six new proposed methods as well as eight international and nine European Standard Methods. In addition the first DIN Standard is included. This method is being referenced in the European Diesel Fuel Specification.

Seven draft European Standards on bitumen have been reviewed by the panels of the bitumen sub-committee.

A draft European Standard (prEN) for determining organic oxygen compounds and total oxygen content for unleaded gasoline by gas chromatography (O-FID) is now being balloted. This method is called up in EN 228, the European specification for unleaded gasoline.

Health

The completion of the IP Epidemiology research project has been delayed by the unforeseen complexity of researching work history data and the estimation of exposure of workers to benzene. Completion of the leukaemia part of the study is not now expected until early next year, with completion of the other parts of the study later in the year.

Guidelines on the Health Aspects of Air Quality have been completed and will be available shortly, as will a summary of the Workshop on Air Quality and its Association with Respiratory Disease held at the Institute in February.

Petroleum Measurement

The Petroleum Measurement Paper No 6: Guide to Coriolis Direct Mass Flowmeters is now being progressed for publication.

Comments received on the ballot of the Guide to Recommended Measurement Practice for Compliance with the Requirements of HMCE Notice 179 have been reviewed by the joint IP/HMCE/SIA/ITSA/UKPIA Working Group. The text is being revised to incorporate the agreed changes and will then be re-issued to working group members before publication.

Final changes to Guidelines for Loss Control at Refineries are awaited. This document is being quoted in industry responses on VOC controls at refineries.

Environment

The Air Quality Sub-committee has produced a report on the `Methodology for estimating VOC emission, the quality of the estimates and the frequency of estimation'. This report has been used by UKPIA in its submission to the House of Commons Environment Committee inquiry into VOCs.

A new Land Contamination Sub-committee has been set up and its initial task is to look at retail sites.

A successful conference was held on the subject of `Environmental Management - Implications for the Oil Industry'. Papers provided an insight into how an eco-management and audit scheme will work and examples of companies' experiences.

The Sector Application Guide for refineries to be used in conjunction with BS 7750 has been completed and is currently being prepared for publication.

Refining & Marketing

The Institute in conjunction with APEA established the Industry Technical Co-ordinating Body responsible for production of technical guidance to replace HS(G)41 for service stations.

The second stage of the QRA study of detonation arresters in vapour collection systems has been completed and the field pressure measurement stage of the project to develop guidance for design of service station vapour collection systems has been started.

A Code of Practice on Internal Floating Roofs has been published (see page 574).

A project for the preparation of a specification for underground pipework systems at service stations has been developed.

A forum on electrostatic hazards in gantry meter proving was held last month. The background to several known incidents was described and an account given of the results of an extensive research programme into the causes. Guidance was given on the avoidance of the hazards (see page 572). A Working Group is drafting Guidelines on recommended safe procedures for gantry meter proving.

Guidelines for the Uplift of Product from Service Stations and Customer Tanks is now available (see page 570).

The Code of Practice for On-Board Truck Computer Systems is being printed and will be sold through our publishers, John Wiley.

The review of comments on the revision of the IP Tank Cleaning Safety Code has been completed. Because of the significance of some of the comments, it will be necessary to re-issue the draft to committees for their endorsement or comment before it can be published.

John Hayes,Technical Director

INSTITUTE NEWS

NEW MEMBERS

Mr J R Adams, 24 Ballochney Street, Aidrie, Lanarkshire, , ML6 0LE.
Mr P Baker, Beckside Farm, Gleaston, Ulverston, Cumbria, LA12 0QD.
Mr M J Barrett, 27 Arthur Road, Wimbledon, London, SW19 7DN.
Mr R G Batchelor, Hardy Oil & Gas plc, 7th Floor, Commonwealth House, 2 Chalkhill Road, London, W6 8DW.
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Mr A B Kulkarni, Shell Marketing (Oman) Ltd, P O Box 74, Muscat P Code 116, Sultanate of Oman.
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Mr E J Yongo, 216 Rosemount Place, Aberdeen, AB2 4XR.
Mr J V A Yorston, AMEC Process & Energy Ltd, City Gate, Altens Farm Road, Nigg, Aberdeen, AB1 4LT.

STUDENTS

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Mr M D Fews, 35A Kingston Road, Staines, Middx, , TW18 4OH.
Mr B D Nutt, 15 Wiltshire Avenue, Burton Stather, Scunthorpe, South Humberside, DN15 9EH.
Miss M Thorsen, 40 Perth Road, Dundee, DD1 4LN.
Miss M M J Malcomson, 19 Cedar Haven, Donaghmore, Newry, County Down, Northern Ireland, BT34 1SQ.
Miss M K Omalu, 31 Tay Mills, 19 Brown Street, Dundee, DD1 5EF.
Mr A O Banjo, University of Dundee, Wimberley House 24, Room 6, Dundee, DD2 1UP.
Mr J S M Fitzpatrick, Old Manse, 2 Crosshill Tce., Wormit, Newport-on-Tay, Fife, DD6 8PS.
Mr A Dalley, 3 Willingdon Road, Wood Green, London, N22 6SG.
Mr P W Wickenden, Timbers, 9 Blatchington Hill, Seaford, East Sussex, BN25 2AH.
Mr M Naito, 109 Cavendish Meads, Ascot, Berks, , SL5 9TG.
Mr N S Molkenthin, 8 Rothwell Way, Botolph Grn, Peterborough, PE2 7WE.
Mr J Macarthur, 3 Melford Court, 3/5 Cavendish Road, Sutton, Surrey, SM2 5ET.

STUDENT PRIZE WINNER

Mr C J Morgan, 14 Holburn Street, Aberdeen, AB1 6BT.

NEW FELLOW

Mr A F Levy

Mr Levy has worked in the oil and gas industry for over 15 years, the first 10 of these spent with Esso Petroleum where he gained a breadth of experience in the downstream before leaving to establish his own management consultancy practice. Mr Levy combines his consultancy work with university lecturing and non-executive directorships of Flogas plc, Greenway Holdings plc and EMO Oil Ltd of which he is Chairman. He was elected to serve on the Institute of Petroleum's Council in 1992 and is also a member of the P & I committee.

NEW COLLECTIVE MEMBERS

The International Bureau for Energy Studies
NIOC House,
4 Victoria Street,
London, SW1H 0NE.

IP nominated representative: **Mr M Alipour-Jeddi**

IBES is a non-profit-making independent research bureau that has been formed to conduct research to stimulate debate on economic, social and strategic aspects of international energy issues and aims to create a forum to reflect the policy issues that concern petroleum producing states, with a view to creating an atmosphere of co-operation and collaboration between all major decision-makers.

INSTITUTE NEWS

Cyma Petroleum Ltd
87 Sunnyside Road,
London, N19 3SL.

IP nominated representative: **Mr A Michaelides**
Cyma Petroleum Ltd is a small independent company specialising in importing, marketing, distribution and retailing of petroleum products and aviation fuels. The company is an approved Ministry of Defence contractor and is a BSI registered firm.

HMT Rubbaglas Ltd
Consort Works,
Consort Road,
London, SE15 3ST.

IP nominated representative: **Mr P G Hynds**
HMT Rubbaglas Ltd are manufacturers and suppliers of 'Flex-A-Seal' seals for floating roof tanks; 'Aluminator' internal decks and seals for fixed roofs; 'Pivot Master' drainage systems and 'Checkmate' hydrocarbon sensing valves. An installation service can also be provided. Tank inspection to API 653.

Around the Branches

Northern Branch
2 December: *Annual Dinner Dance*, 7.30 pm, Belfry Hotel

Southern Branch
6 December: *Visit to AEA Winfrith*

Stanlow Branch
7 December: *Recent Developments for Energy Saving in Industry*, Chris Grove of Merseyside Innovation Centre, 7.30 pm at The Hoole Hotel, Chester

Edinburgh & South East Scotland Branch
8 December: *Hydrostatic Cleaning and Testing the NW Ethylene Pipeline*, 6.30 pm at The Harp Hotel, Corstorphine

Aberdeen Branch
13 December: *The Work of the NEL*, Ian Knox, NEL, 6.30 pm, Tree Tops Hotel
10 January 1995: *The Role of the Procurator Fiscal in Offshore Matters*, G R Craig, Procurator Fiscal, 6.30 pm, Tree Tops Hotel

Presentation of Certificate of Merit to Paddy Watson

Picture shows Mr George Bailey, (left) Chairman of the North East Branch, presenting the Certificate to Paddy Watson (right).

The certificate was awarded by the Institute in recognition of his long and distinguished service on various standards committees.

Paddy Watson joined the Institute in the 1960s and has been a Fellow of the Institute since 1970. He has served more years than memory records on the Petroleum Measurement Committee and has chaired the sub-committee PM-F for the last several years.

He is a world authority on tank gauging. He represented the Institute on the International Committees (ISO,CEN British Standards Institute and The American Petroleum Institute among others) which decided the International Standards for tank gauging, breather valves, flame arresters and vapour recovery. Indeed he was instrumental in writing many of these standards.

Mr Watson is a member of the Association of Naval Architects and still has an abiding interest in shipping. He has written many articles on the rise of the 'supertanker' and on shipping generally. Following his retirement in October last year, he is writing a book 'The History of the Tankship'.

UK Deliveries into Consumption (tonnes)

Products	*†Sep 1993*	**Sep 1994*	*†Jan-Sep 1993*	**Jan-Sep 1994*	*% Change*
Naphtha/LDF	145,366.0	147,487.0	2,260,367.0	2,034,554.0	-10
ATF – Kerosene	658,728.0	671,396.0	5,390,883.0	5,463,849.0	1
Petrol	1,994,275.0	1,910,261.0	17,754,444.0	17,074,695.0	-4
of which unleaded	1,075,564.0	1,126,135.0	9,245,144.0	9,744,023.0	5
of which Super unleaded	124,483.0	117,295.0	1,095,294.0	1,065,638.0	-3
Premium unleaded	951,081.0	1,008,840.0	8,149,850.0	8,678,385.0	6
Burning Oil	220,512.0	193,513.0	1,806,440.0	1,861,442.0	3
Derv Fuel	1,030,035.0	1,130,994.0	8,715,934.0	9,418,096.0	8
Gas/Diesel Oil	648,058.0	625,865.0	5,687,899.0	5,652,176.0	-1
Fuel Oil	921,366.0	846,921.0	7,836,202.0	6,941,946.0	-11
Lubricating Oil	67,555.0	71,109.0	606,426.0	598,881.0	-1
Other Products	677,959.0	737,243.0	5,954,169.0	6,323,950.0	6
Total above	**6,363,854.0**	**6,334,789.0**	**56,012,764.0**	**55,369,589.0**	**-1**
Refinery Consumption	523,618.0	485,266.0	4,704,236.0	4,668,023.0	-1
Total all products	**6,887,472.0**	**6,820,055.0**	**60,717,000.0**	**60,037,612.0**	**-1**

*† Revised with adjustments *preliminary*

FORTHCOMING EVENTS

December

1st
London:
'Internationalisation, Power & Energy Services'. Details: Conference Department, The Institute of Energy, 18 Devonshire Street, London W1N 2AU.
Tel: 071 580 0008
Fax: 071 580 4420

1st-2nd
Aberdeen: 'Offshore Safety Cases – Problem Areas and Lessons Learned'. Details: Nadia Ross, IBC Technical Services Ltd, Gilmoora House, 57-61 Mortimer Street, London W1N 7TD.
Tel: 071 637 4383
Fax: 071 631 3214

5th-6th
Aberdeen: 'Successfully Implementing Benchmarking in the Oil & Gas Industry'. Details: Customer Services Manager, IIR Ltd, 28th Floor, Centre Point, 103 New Oxford Street, London, WC1A 1DD.
Tel: 071 412 0141
Fax: 071 412 0145

6th-7th
London: 'SUBSEA '94 International Conference'. Details: Subsea '94 International Conference, Themedia Ltd, PO Box 2, Chipping Norton, Oxon OX7 5QX.
Tel: 0608 684888/684700
Fax: 0608 684796

6th-9th
Singapore: 'Offshore South East Asia '94'. Details: Overseas Exhibition Services Ltd, 11 Manchester Square, London W1M 5AB.
Tel: 071 486 1951
Fax: 071 486 8773

7th-8th
Vienna: '2nd International Conference on the Refining Industry in the Former Soviet Union'. Details: Conference Division, 11-13 Charterhouse Buildings, London EC1M 7AN.
Tel: 071 490 3774
Fax: 071 490 8932

7th-8th
London: 'Petroleum Trading and Measurement Accuracy', Details: Abacus International, 214 Inchbonnie Road, South Woodham Ferrers, Essex CM3 5WU.
Tel: 0245 328340
Fax: 0245 323429

8th
London: 'Changes in Inspection for Re-Certification of Subsea Structures'. Details: Society for Underwater Technology, PSTI House, Exploration Drive, Offshore Technology Park, Bridge of Don, Aberdeen AB23 8GX.
Tel: 0224 823637
Fax: 0224 820236

8th
London: 'Dispute Resolution in the International Oil and Gas Industries'. Details: Caroline Little, The Institute of Petroleum.

8th-9th
London: 'Floating Production Systems'. Details: Nadia Ross, IBC Technical Services Ltd, Gilmoora House, 57-61 Mortimer Street, London W1N 7TD
Tel: 071 637 4383
Fax: 071 631 3214

8th-9th
London: 'Oil and Gas Agreements'. Details: Langham Oil Conferences Ltd, 37 Main Street, Queniborough, Leicester LE7 3DB.
Tel: 0509 881022
Fax: 0509 881576

12th-13th
London: 'Improved Preparedness to Prevent Disaster through Effective Ship Emergency Planning'. Details: IIR Ltd: 28th Floor, Centrepoint, 103 New Oxford Street, London WC1A 1DD.
Tel: 071 412 0141
Fax: 071 412 0145

12th-13th
London: 'Gaining the Competitive Edge in a Changing UK Gas Market'. Details: EuroForum, 14 Bowden Street, London SE11 4DS.
Tel: 071 582 2423
Fax: 071 793 8544

12th-13th
London: 'UK & International Oil & Gas Taxation'. Details: The International Faculty of Finance, 2nd Floor, Market Towers, 1 Nine Elms Lane, London SW8 5NQ.
Tel: 071 344 3830
Fax: 071 344 3860

14th
Aberdeen: 'Advances in Diving Technology'. Details: Society for Underwater Technology, PSTI House, Exploration Drive, Offshore Technology Park, Bridge of Don, Aberdeen AB23 8GX.
Tel: 0224 823637
Fax: 0224 820236

14th-15th
Aberdeen: 'Effectively Streamlining Offshore Information Management'. Details: IIR Ltd, 28th Floor, Centre Point, 103 New Oxford Street, London WC1A 1DD.
Tel: 071 412 0141
Fax: 071 412 0145

15th-16th
London:
'Understanding Energy Derivatives'. Details: The International Faculty of Finance, 2nd Floor, Market Towers, 1 Nine Elms Lane, London SW8 5NQ.
Tel: 071 344 3830
Fax: 071 344 3860

January

10th-11th
Aberdeen: 'Successful and Cost-Effective Abandonment'. Details: IIR Ltd: 28th Floor, Centrepoint, 103 New Oxford Street, London WC1A 1DD.
Tel: 071 412 0141
Fax: 071 412 0145

11th
London: 'Modelling in Oils'. Details: Robert Simons, Mathematical Programming Study Group.
Tel: 0525 852660
Fax: 0525 852654

15th-17th
Oman: 'Third Annual Middle East Petroleum & Gas Conference (MPGC '95)'. Details: PO Box 1736, Raffles City Post Office, Singapore 9117.
Tel: (65) 256-9341
Fax: (65) 254 5628

16th-20th
Leeds: 'Spark Ignition Engine Emissions'. Details: Miss Julie Charlton, Department of Fuel and Energy, University of Leeds, Leeds LS2 9JT.
Tel: 0113 233 2494
Fax: 0113 233 2511

18th-20th
Poland: 'Eastchem 95'. Details: Expoconsultant, PO Box 200, 3600 AE Maarssen, The Netherlands.
Tel: (31) 3465 73777
Fax: (31) 3465 73811

20th
London: 'Competition in Gas: New Challenges in an Evolving Market'. Details: Lisa Inch, Marketing Executive, The Economist Conferences, 15 Regent Street, London SW1Y 4LR.
Tel: 071 830 1154
Fax: 071 409 3296/ 931 0228

FORTHCOMING EVENTS

23rd-24th
London: 'Maintaining a Profitable Presence in The North Sea Oil and Gas Industry'. Details: AIC Conferences Ltd, 2nd Floor, 100 Hatton Gardens, London EC1N 8NX.
Tel: 071 242 1548
Fax: 071 242 2320

24th-26th
Cairo: 'Egypt Gas Seminar'. Details: Roger Hughes, Overview Conferences, 82 Rivington Street, London EC2A 3AY.
Tel: 071 613 0087
Fax: 071 613 0094

25th-26th
Hong Kong: 'GasTrade '95'. Details: Mrs Nicola Chaplin, Conference Administrator, GasTrade Ltd, Bracken View, Hawridge Common, Chesham, Bucks HP5 2UG.
Tel: 0494 758121
Fax: 0494 758802

26th-27th
London: 'Exploiting Opportunities and Future Developments in Power Generation & Supply'. Details: IIR Ltd, 28th Floor, Centre Point, 103 New Oxford Street, London WC1A 1DD.
Tel: 071 412 0141
Fax: 071 412 0145

31st-1st
Haugesund, Norway: 'Gas Transport Symposium '95'. Details: Gerd Jaeger, Norwegian Petroleum Society, Sandslimarka 251, PO Box 95, 5049, Sandsli, Bergen, Norway.
Tel: (47) 55 99 72 35

February

7th-8th
Amsterdam: 'Identifying & Seizing Opportunities in Europe's Changing Gas Market'. Details: European Gas Strategies 95, Administrator, ICBI, 2nd Floor, Market Towers, 1 Nine Elms Lane, London SW8 5NQ.
Tel: 071 344 3830
Fax: 071 344 3860

9th-10th
Denmark: 'Offshore Pipeline Technology'. Details: Nadia Ross, IBC Technical Services Ltd, Gilmoora House, 57-61 Mortimer Street, London W1N 7TD.
Tel: 071 637 4383
Fax: 071 631 3214

13th-16th
London: IP Week. Details: Caroline Little, The Institute of Petroleum, 61 New Cavendish St, London W1M 8AR.
Tel: 071 467 7100
Fax: 071 255 1472

20th
Birmingham: 'The Petroleum Officer's Course'. Details: Petroleum Training, Suite 1, Morley House, 314 Regent Street, London W1R 5AB.
Tel: 071 255 2335
Fax: 071 255 1828

21st-23rd
London: 'Scada Oil & Gas Workshop, Conference and Exhibition'. Details: Energy Logistics, 1 Gorse Road, Cookham, Berks SL6 9LL.
Tel: 0628 525492
Fax: 0628 521928

22nd-23rd
London: 'Offshore 95: Design and Safety Assessment for Floating Installations'. Details: Kathleen Ford, Conference Organiser, The Institute of Marine Engineers, 76 Mark Lane, London EC3R 7JN.
Tel: 071 481 8493
Fax: 071 488 1854

27th 3rd
Oxford: 'The Structure and Economics of the International Petroleum Industries'. Details: The Registrar, The College of Petroleum and Energy Studies, Sun Alliance House, New Inn Hall Street, Oxford OX1 2QD.
Tel: 0865 250521
Fax: 0865 791474

Gatwick takes off with new truck

The Airport Special in action at Gatwick Airport

Gatwick Refuelling Services, the aircraft refuelling consortium jointly owned by Mobil, BP, Texaco and Total, has announced its first specially-designed ERT truck from Normand Commercial Vehicles of Middlesex.

The new EC8.27 4 x 2 Tractor has been specially designed and manufactured by ERF to meet the stringent regulations laid down by the aircraft refuelling industry. To comply with petroleum transportation regulations, the unit required the installation of firescreening with a triple engine shutdown and triple battery cut-off facility.

In addition, the short 'stop-start' journeys necessitated the fitting of a fully automatic Allison World Series gearbox. The tractor and 30,000 litre tanker are designed to function as a single unit, with the pump and metering equipment being integrated into the chassis design. This equipment, which has hydrostatic design from the tractor unit to the trailer rear end, allows for the delivery of filtered, metered aviation fuel to a wide range of aircraft.

The EC8.27 4 x 2 Airport Special has also been specified with a Rockwell rear axle on steel spring suspension, and a day cab with LX trim level. The unit is powered by an eight litre Cummins engine with a 275bhp power rating, developing more torque at lower revs, ideal for the manoeuvring requirements of the job.

Complete protection in a paint tin

Leigh's Paints, a leading manufacturer of high-performance coatings for the offshore oil and petrochemical industries, has launched a new epoxy intumescent passive fire protection (PFP) material.

Firetex M90 provides a complete protection system – from primer to top coats – for extreme environments.

The material is solvent-free and offers durability and the economy of lower dry film thicknesses and reduced weight. It can be used in loadings of up to 5mm on structural members without mesh support. A special high temperature fibre mesh is also available for hydrocarbon and jetfire ratings.

The material can be used with comparative ease. The fully-cured film remains capable of being overcoated with itself even after prolonged curing, should remedial work or additional protection prove necessary.

Complete protection for extreme environments

Low-cost antenna

A new low-cost antenna for use as a component of Global Positioning Systems has been launched by passive electronic component specialists, C & C D Ltd.

Global positioning systems are made possible by a network of satellites that allows software on an ordinary computer to determine the geographic position of any object equipped with a GPS transmission system.

The temperature stability, wide directivity yet low cost of the Murata antenna makes it a particularly suitable choice for GPS applications such as vehicle tracking, according to the manufacturer.

New software for distribution

A new module has recently been added by Topas UK to the Microtopas suite of distribution, order processing, stock control and multi-warehousing software in order to facilitate atomatic order generation.

The new module is designed to improve the management and distribution of bulk fuels to retail service station networks.

It provides a complete solution for automatic order generation for owned, subsidiary or dealer service station sites and allows any oil company operating a retail network to generate, in advance, orders based on tank usage and sales according to individual site profiles.

Using up-to-date sales, stock and outstanding delivery information, product 'run-out' dates are calculated. Tank capacity and associated minimum stock details are used to calculate the volume and delivery date required.

Information is polled from point-of-sale technology at each individual site, extracting daily sales figures and current stock levels. This ability to accurately forecast sales can provide a significant improvement in distribution management.

Portable on-site Calor Gas lighting

The Giraffe on-site lighting tower from THI is now available as a Calor Gas-fuelled unit, allowing it to be used anywhere and at any time.

The THI Giraffe also has all the operating advantages of LPG, including lower emissions, lower noise levels, longer intervals between refuelling and greater site safety. These features are particularly useful where the unit is being used late at night in residential or sensitive areas.

The unit, which includes a Suzuki generator and Calor Gas 13kg cylinder, is mounted on an all-terrain trolley. It can then be easily manoeuvred by one person.

The Giraffe also has a totally-adjustable mast which has a maximum extension of three metres and can be angled into any required position. The light head utilises a low-energy fluorescent system which gives the equivalent output of a 500 watt Tungsten light.

Calor gas-powered lighting

Unlike diesel which can wax up during cold weather and petrol which gums up over time, Calor Gas in cylinders has an endless storage life and does not deteriorate, according to the manufacturer. Calor Gas cylinders are also safer to handle than both petrol and diesel, as the sealed cylinder 'completely eliminates' any danger of fuel spillage.

Managing truck deliveries

Liquid Controls Corporation has introduced its next generation of Letrocount – the state-of-the-art on-board truck computer delivery management system.

The new design drastically reduces the overall size and weight of the entire system. The old pedestal mount is gone and the components have been better modularised for better in-field serviceability without the need for special tools or specially-trained personnel.

The system's modularity also allows the user to start with the basic system and add on for present or future needs without financial penalty. In addition, the modular design allows for simple, low-cost upgrades as improved technology becomes available.

Existing users can upgrade by investing in a Supervisory Control Module, lap pad and printer.

Finger on the buzzer

Enter the Button is a new mobile phone system for vehicles that enables the driver to answer a call, make a call and access a comprehensive emergency support service, all by pressing a single button.

Telephone numbers can be pre-recorded using voice alone. The entered numbers will play back at the touch of a button. And if the phone rings, touching the button will answer the call. The system also records and plays back memos.

A 24-hour support service also gives prompt assistance, even if the driver cannot speak, whether through illness, accident, personal attack or hi-jack.

Pressing the button for three seconds triggers a covert call to an incident control centre. Once made, the call will continue to be re-dialled if the connection is not made first time, or if it falls out. The emergency call alerts an incident manager who will assess the situation and summon appropriate assistance using an extensive portfolio of information.

Full details of the vehicle, including make, model, colour and likely driver are entered on a database. The driver's whereabouts can also be known because the system enables him or her to make automatically timed recordings of their location when en route, parked or in a worrying situation.

Finally, from the moment the button is pressed everything that happens in the vehicle is sound-recorded and, once the call is connected, that is also monitored.

The Button offers hands-free operation

Advisory service for design engineers

NEL, the East Kilbride-based engineering technology services organisation, has introduced a new, free technical advisory service which will enable design engineers to take advantage of the very latest technological developments in exploration, production and marginal field development.

At the heart of this new service is one of Europe's most sophisticated test analysis laboratory, multi-phase flow and experimental facilities. Backed by an engineering and research team, it will draw on over 40 years' experience in turnkey project management problem-solving, contract R&D, design simulation, testing, training, technology transfer and turnkey project management.

The new service will cover areas such as environmental engineering, safety, reliability, structural integrity, subsea systems, pipelines, risers, umbilicals, deep water tethers and production technology. Much of NEL's recent work in this field has been associated with fluid flow regimes and multi-phase metering.

Power racking offshore

Eltek (UK) has launched a power racking system for offshore applications.

The compactness of the new PRS5000OS system means that it saves on space but it also saves on cost, according to the manufacturer.

'Normal practice with offshore applications is to duplicate the complete power system for back-up, therefore doubling the cost,' said Eltek. 'However, because this a modular system, one unit can consist of a set of modules for normal use with a further module included to provide hot-standby.'

The system provides up to 600 amps at 50VDC from a single 19-inch racking cabinet and is available with 100 amps to 3,000 amps output power.

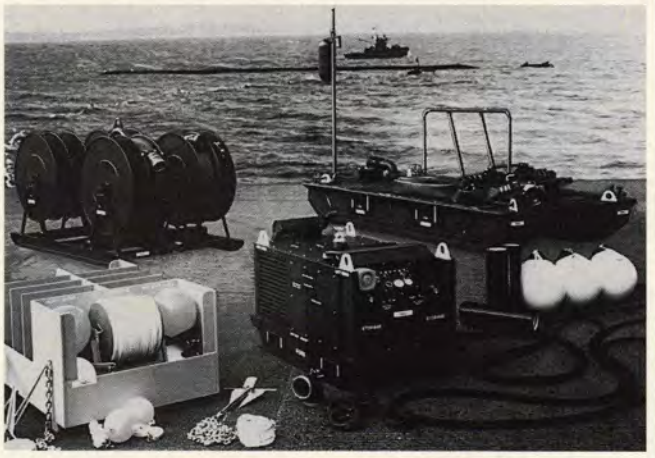
New fuel transfer system

Alan Cobham Engineering has introduced a hydraulically-driven remote pumping system for fuel transfer ship to ship or ship to shore. It can also be used in emergency situations for oil recovery.

The system was developed in collaboration with the British Ministry of Defence, for the British Army, to offload fuel dracones – floating flexible tanks for transporting fuel.

Cobham's high performance system is used with 350 tonnes dracones and can discharge fuel at 100 tonnes/hr.

Installed in a protective casing, the pump is designed to be mounted on the nose of the dracone. The hydraulic hoses connect it via the floating platform to the powerpack on the shore, from which the pump can be controlled. It is equally suitable for submersible applications and can be used for recovering oil from the hold of stricken ships and oil spill operations.



Hydraulically-driven remote pumping system for fuel transfer

The hydraulic powerpack can be used to power hydraulically-powered cutting and other equipment in both underwater and surface applications. Approximately 19KW is available to the operator at the end of the 250m supply/return hoses.

The dracones can be towed by large and small ships, and the unit can be used for remote pumping operations.

Beware of static

Cenelectrex has produced a new range of static hazard warning signs.

In hazardous atmospheres, where there is a risk that static may cause an explosion or fire, it is accepted practice to always attach an earthing or bonding clamp to all portable or mobile items before performing any type of industrial process.

The new signs are designed to be sited adjacent to wherever filling, unloading, cleaning, mixing, grinding or transferring is due to take place in order to remind operators of the risk and of the proper safety procedures.

The signs are manufactured from non-flame foamex board or self-adhensive vinyl and conform to the requirements of BS5378.

Attach earthing clamp first!

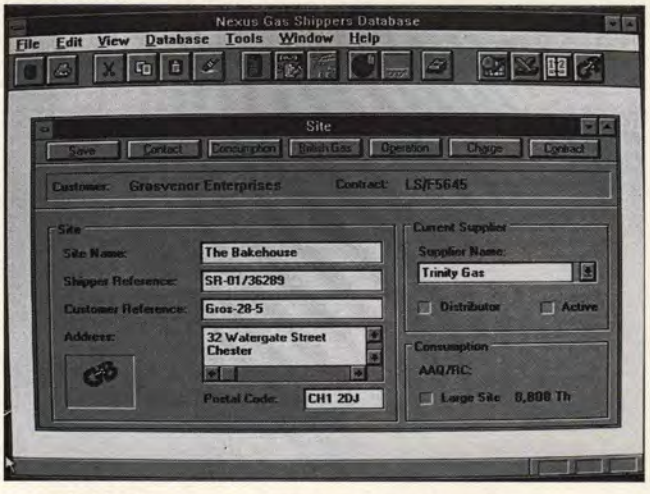
Gas shippers' database

Logica has launched an information management system for gas shippers and marketers called Nexus.

At the heart of the system is a comprehensive gas shippers' database, holding all customer, contract and site information. Designed specifically for the UK market, the system has a number of optional integrated modules to support different business functions, such as sales and marketing, invoicing and supply/demand balancing.

Nexus was developed following detailed discussions with UK companies involved in gas shipping and marketing.

The system comprises several optional modules, including one for sales and marketing which provides both market analysis and sales management support from strategic planning down to direct mail and telesales activities.



Nexus holds all customer, contract and site information

Forecourt chemicals range

Carlton Industrial has launched a new range of cleaning chemicals to cover the specific needs of petrol forecourts.

The range includes: a heavy duty cleaner for pumps, islands and diesel areas; a car wash panel cleaner; and a multi-purpose cleaner and fragranced germicide for panels, surfaces and floor mopping.

CONTACTS

Gatwick Refuelling Services	0293 527044
C & C D	0494 882792
W & J Leigh	01204 21771
Topas UK	0628 475111
THI	061 627 0444
NEL	03552 20222
Liquid Controls	0101 708 295 1050
Auto Alert	01923 232323
Eltek (UK)	01442 219355
Alan Cobham Engineering	0258 451441
Cenelectrex	0115 981 9666
Logica	071 637 9111
Carlton Industrial	01908 265776

PEOPLE

Judith C Hanratty **has been appointed Company Secretary of The British Petroleum Company plc, replacing *Richard Grayson* who has retired after 19 years. She also retains her previous responsibilities as BP Head of Group Insurance and Managing Director of The Tanker Insurance Company Ltd which she has held since 1988.**

Aviva Petroleum Inc. announces that the Directors of the Company have appointed **Mr Charles A Boyce**, recently retired Vice - Chairman of Caltex Petroleum Corporation, Irving, Texas as a non-executive director of the Company.

Mr Lodwrick M Cook (Chairman of ARCO, and Chairman of the Rebuild LA organisation RLA) was honoured with the insignia of Honorary Knight Commander of the Most Excellent Order of the British Empire (KBE) by **His Royal Highness the Prince of Wales**. Mr Cook was invested in Los Angeles at the Hancock Park residence of **British Consul-General Merrick S Baker-Bates** alongside well-known film, stage and television actress **Miss Angela Lansbury**. The honour recognises Mr Cook's contribution to Anglo-American relations.

Two of the oil industry's leading figures have agreed to act as advisers to Lloyd's Register. **John D'Ancona** and **Tony Barrell** will contribute knowledge and expertise in their specialist areas in support of LR's expanding offshore activities.

Dragon Oil plc has announced the resignations of **Messrs Henry Wilson, Chris Green** and **Hugh Allerton** as directors of the Company and the appointments of new directors **Messrs Tsui Tsin-Tong, Roberto V Ongpin, Dr Walter Brown** and **Fung Ka Pun** have taken effect and that **Dr Oliver Waldron** has resigned as Chairman and has been replaced by **Mr Tsui Tsin-Tong** but will continue as Chief Executive Officer and Joint Deputy Chairman with Roberto V Ongpin.

Enterprise Oil today announced the retirement of two of its executive directors with effect from January 1. **Dr Iain Watt**, Technical Director – UK who joined the Board in 1987. His responsibilities will be assumed by **Mr Mark Hope** as General Manager – UK. **Mr Edward Harris**, Technical Director – International Operations, joined the Board in 1985. His duties will be taken over by **Dr Andrew Armour.** He will become General Manager – Technical.

Oil Explorer and Producer OMV (UK) Ltd has appointed **George Goodsir** as Commercial Director and Company Secretary.

The new Managing Director of Shell Bitumen has been named as *Mr Tim Green.* He succeeds *David Weston* who has been promoted to a senior supply and marketing liaison role in Shell International Petroleum Company Limited.

Nicholas V Scheele, **Chairman and Chief Executive of Jaguar Cars Ltd, has been elected President of BEN — Motor and Allied Trades Benevolent Fund. Mr Scheele, who took office at BEN's recent AGM succeeds *Alan Pond,* Chairman and Managing Director of the filling stations group Oakstead Holdings Ltd.**

New appointments to A&B Geoscience are: **Mike Smith,** Regional Manager, Europe; **Paul Brettwood,** Regional Manager, Non-Europe; and **Alan Hart,** Geophysicist.

Mr Francesco Nanotti has been appointed Chairman of Saipem UK Ltd with effect from 20 October. **Mr Vincenzo Oliveri**, formerly Deputy General Manager and a Director of European Marine Contractors Ltd., has been nominated Managing Director of this Subsidiary.

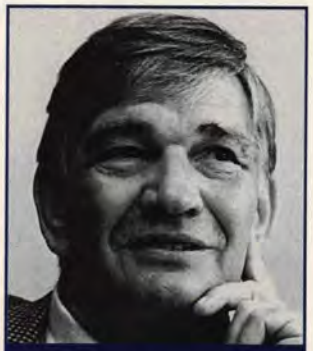
Sir Christopher Bland has been named as Director of NFC plc and will succeed **Mr James Watson** as Chairman following his retirement on 19 December. Sir Christopher is Chairman of Life Sciences International plc and of Hammersmith & Queen Charlotte's Special Health Authority.

Esso chairman **Keith Taylor** has been elected a Fellow of the Royal Academy of Engineering. He is one of 49 Fellows who were elected at the academy's annual meeting in London.

Mr Barry Cheung has been appointed Chief Executive of Fortune Oil plc. **Mr Daniel Chiu**, currently Chief Executive will continue to serve the Company as Executive Vice-Chairman. **Mr Philip So** has also been appointed as General Manager and **Ms Siu-Wai Ng** as Deputy General Manager. **Mr Ng Juak Khoon**, an Executive Director of Fortune Oil and **Mr Brian Hall**, a non-Executive Director are both resigning from the Board.

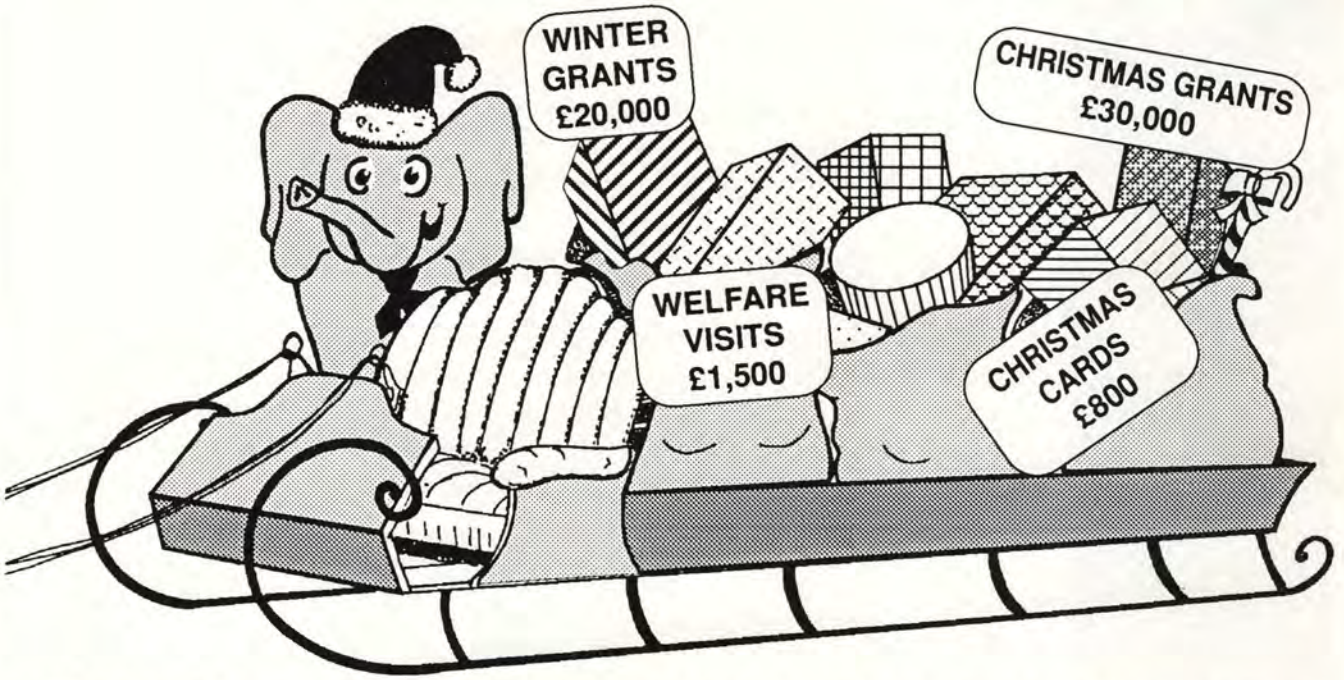
Mike Healy has been promoted to Operations Director of the Tankers Division at United Transport (UK) Ltd. His colleague **Alan Jones** becomes Operations Director of the Multi-User Warehousing Distribution and **Robert Janes** joins the company as Operations Director, Milk Division.

Esso UK plc has announced that **Mr Ian Upson** has been appointed as managing director of its subsidiary company, Esso Petroleum Company Ltd. He succeeds **Mr Dave Clayman**, as managing director following the announcement of his retirement. Mr Clayman will remain a director of all three companies.



Ben Voogd **has joined Smit International as Area Manager, Europe. He has moved to Smit from Volker Stevin, where he was Managing Director of Volker Stevin Offshore. Smit International's activities include maritime contracting and civil works, salvage, offshore supply and harbour towage.**

Ben CHRISTMAS APPEAL '94



Please help us to put a little sparkle back into Christmas for those who, without our support, would find Christmas is just another day.

Distress, bereavement, poverty and loneliness are difficult enough to endure at any time of the year. They are much worse at Christmas.

We at BEN cannot stand aside knowing that there are many people for whom this Christmas will be a nightmare. Families who cannot afford a Christmas dinner; parents who don't have the money to buy presents for their children; old people living alone for whom Christmas Day will be just like any other day of loneliness.

This year BEN will be making
200 winter grants of £100 . . . . total cost: £20,000
600 Christmas grants of £50 . . total cost: £30,000

BEN's Welfare Team will make 500 visits during the winter months total cost: £1,500 .
and BEN will send 2,000 Christmas cards to beneficiaries total cost: . £800 .

and for many that BEN card will be the only Christmas card they receive

Please fill in the coupon and send with your donation to: The Director of Fundraising,
BEN — Motor and Allied Trades Benevolent Fund
Lynwood • Sunninghill • Ascot • Berkshire SL5 0AJ
Reg Charity No: 297877

I would like to help by donating £ to the BEN 1994 Christmas Appeal

Name:

Address:

Company:

Position: