

PETROLEUM REVIEW



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OF PETROLEUM

September 1995

Offshore

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COVER PHOTO

Brent Bravo. Photo by Shell Photo Service

NEWS IN BRIEF

20 July

Nigeria's Foreign Minister Tom Ikimi has assured Shell and BP that his country will encourage and protect all international investment in oil and non-oil industries.

23 July

BP has agreed to pay out \$21m to the state of Alaska in order to settle tax claims between 1978 and 1990.

24 July

Shell announced plans to participate in the construction of an oil refining and petrochemical complex in the south China province of Guangdong. The \$6 billion complex will have the capacity to refine 8m tonnes of crude oil per annum.

The Cypriot-flag crude carrier

Sea Prince grounded five miles off the South Korean coast forming a 700 tonne oil slick. The 275,782 dwt vessel, which is owned by Hoya Tanker, hit rocks after a typhoon warning forced it to interrupt discharge operations at the port of Yosun and move back out to sea.

25 July

Amerada Hess, Elf Enterprise and Texaco have signed a three-year alliance contract with Collexip Stena Offshore for the shared provision of diving support vessels and services in the North Sea.

Ranger Oil has acquired a 75 percent working interest and ownership in the southern North Sea block, 48/22. The deal is part of an exchange of licence interests with Enterprise Oil and Fina.

British Gas, Amoco and Cabot have formed a new company to own and operate an LNG plant planned for Trinidad and Tobago. British Gas will have a 31 percent stake in the Atlantic LNG Company, in which the local Natural Gas Company will also have a 10 percent interest. The plant, which would process 3m tonnes of LNG a year, is due to receive final authorisation early next year.

Chairman of the National Iranian Tanker Company, Mohammad Soury, said the company has chartered 28 tankers to work alongside its current fleet of seven.

The US House of Representatives has voted to end the 22-year prohibition on exports of Alaskan North Slope crude oil by more than four to one.

26 July

Dana Exploration has acquired a 30 percent working interest in the Sortymskoye oilfield in Western Siberia. It has the added option of increasing the stake to 50 percent against certain financial criteria at a later date.

27 July

Kinetica is to extend its high pressure Theddlethorpe-Killingholme gas pipeline through to the Lindsey oil refinery. Over 1,000m will be added to the pipeline following an agreement with Business Gas and Total Gas Marketing.

BP has discovered two 'major new oil and gas finds' overlying the recently-discovered Volcanera in the Llanos foothills of Colombia. Named Florena and Pauto, the new finds have boosted estimated recoverable reserves for the three-field complex to some 1 billion barrels of liquid and 10 trillion cubic feet of gas.

Lasmo is back in the black with a post-tax return of £22m for the first half of the year, against a loss of £13m last time.

BP Energy has announced long-term energy management contracts worth a total of £30m with three paper mills in Britain.

28 July

A US Congressman has proposed that oil and gas companies operating in the Gulf of Mexico at depths of 200 metres or more should enjoy 'royalty holidays' in order to encourage more production.

Romania has delayed an oil round originally scheduled for this summer until the beginning of next year. Up to 14 on and offshore blocks are up for grabs in the auction which has been delayed by the National Agency for Mineral Resources 'because of new oil legislation'.

31 July

A 29-year-old diver, employed by Collexip Stena Offshore, died whilst laying cables off the coast of Norfolk. The company

refused to comment upon speculation that Bradley Westell had become caught up in a vessel propeller.

Premier Oil has increased its estimate of reserves at Wytch Farm from 320m to 364m barrels.

1 August

The South African Central Energy Fund has announced plans to reduce its strategic oil stockpile by 20m barrels to around 35m barrels. The oil will be sold to Sasol's Nafat refinery.

Alliance Resources is to form a joint venture company with Albpetrol to increase production from the onshore Kucova field in south central Albania.

Arco has acquired Purbeck's 25 percent interest in blocks 43/22a and 43/17c in the carboniferous region of the UK southern gas basin.

Elf has begun its \$300m development of the Ofon field, offshore Nigeria, in a joint venture with the NNPC. First oil is expected in early 1998.

2 August

The Iranian Petroleum Ministry has announced plans to offer 10 oil projects up for foreign investment.

EGIS has been awarded the contract to provide well engineering services for BP's fast-track West of Shetland Foinaven development.

The Falkland Islands will launch its first oil exploration round in early October, according to the UK Foreign Office. The announcement was made despite the fact that agreement on licensing has not been reached with Argentina. Mr Florencio Azenolaza, head of the Argentinian government's foreign affairs committee, described the move as 'blackmail'.

Petrogal Chief Executive Manuel Ferreira de Oliveira has said that up to 60 percent of the company's shares may be floated on the stock market in 1997.

The world's first sea-based power station has been launched in Glasgow. The Osprey, which

weighs 800 tonnes and converts wave power into electricity, will be stationed off the coast at Dounreay.

3 August

BP and Shell have announced two major deepwater discoveries in the Gulf of Mexico which will double BP's reserves from 300m barrels to 600-700m barrels. The finds are located largely in the Wasatch and Ursal fields.

BP has awarded JP Kenny a preliminary engineering design contract for a regional gas transportation and processing system in Vietnam.

HSE has published a report which warns that welders using oxy-propane torches to preheat steelwork immediately prior to welding may be at risk from the build-up of explosive gases.

4 August

Saudi Arabia's non-oil exports grew by 13 percent in 1994, according to the Saudi Industrial Development Fund.

The US government has agreed to pay out \$175m to eight oil companies, which in turn will drop their claims to 23 Alaskan and 73 Florida Outer Continental Shelf leases. Amoco, Chevron, Mobil, Murphy Oil, Pennzoil, Shell, Unocal and Texaco took action after the government imposed a drilling moratorium on these areas.

6 August

Det Norske Veritas has begun its independent survey of the contents of the Brent Spar loading buoy. The Nkr2m contract will involve a staff of 10 experts and the first report will be published on 18 October.

Lasmo has promised a wide-ranging overhaul of its internal structure, in response to a survey which revealed deep dissatisfaction amongst staff. Ernst & Young and the Hay Group will advise on the reorganisation, which begins in mid-October.

Research carried out at Edinburgh and Heriot-Watt Universities has revealed that techniques used to extend the life of older oilfields could cause earthquakes measuring up to four on the Richter scale.

NEWS IN BRIEF

7 August

The Canadian arm of Hardy Oil & Gas has agreed to sell its assets to Cometa Energy for C\$41.1m.

Fina is to terminate its collective agreement with the TGWU and withdraw trade union recognition from its UK manual workers from the end of September.

Grampian's public protection committee has called upon the government to help pay for the cost of policing the Brent Spar after it was boarded by Greenpeace. The exercise cost £20,000 in wages, according to Grampian police.

Glaswegian Stirling Shipping Company and Star Offshore Services of Aberdeen are to merge, making Stirling the largest operator of platform supply vessels in the UK sector of the North Sea.

8 August

Enterprise Oil has announced the completion of the 21/20A-5 well on the Bligh Prospect in the central North Sea, 100 miles east of Aberdeen. The company will now evaluate the commercial potential of the find.

9 August

Chevron has signed a two-year geophysical agreement with the China National Offshore Oil Corporation to explore 3,300 sq km off the Hainan Province in the South China Sea.

Cairn Energy has completed its acquisition of Clyde Petroleum (North Sea), including its 10 percent stake in the Gryphon field.

Liberal Democrat Transport Spokesperson Paul Tyler has proposed a differential duty on cars according to their fuel efficiency.

Shetland Islands Council has offered to halve the rent paid by oil companies using the Sullom Voe oil terminal from next April, provided Shell and Chevron do not opt for offshore loading at Brent and Ninian when the lease expires in 2000.

The Brazilian Senate has granted final approval to an end to state monopoly over the distribution of natural gas by pipeline.

10 August

Neste is to sell its UK North Sea interests to the Swedish group, Sands Petroleum, for \$135m. The sale reflects Neste's decision to focus on production in the Norwegian North Sea and the Middle East.

Texaco and BP are to invest more than £290m in the North Sea Erskine field over the next two years. New technology will be used to deal with high pressures and temperatures.

11 August

Lasmo has acquired new exploration acreage in the Boqueron region of Colombia.

Kvaerner and Endac have formed a new engineering company in the FSU.

14 August

Statoil has cut drilling costs by 60 percent over the past two years.

Hungary has disclosed that approximately one-third of national oil company, MOL, will be sold to domestic and foreign buyers by the end of the year.

Oceanengineering International's newest semi-submersible rig, *Ocean Developer*, has sunk off the coast of Angola. All 24 crew members were rescued.

Gazprom has confirmed its interest in developing the Priazlomovye offshore field, situated in the Pechora Sea in the Russian Arctic. The move is part of the company's plans to raise income by moving into oil.

Croatia is to re-open the Adriatic oil pipeline, following its recapture of Krajina through which the line runs. Linking the port of Omisalj on the Adriatic Sea with central Europe, the line was closed four years ago when Croatian Serbs besieged the area.

15 August

Ukrnaft is to float a 30.5 percent stake in October, according to the Interfax Ukraine news agency. The sale is not open to foreign investors who must wait until a subsequent floatation in which a further 15 percent of the company is up for grabs.

Well Management Systems of

Aberdeen has won the Sir Ian Wood Award for Innovation. The company is the first recipient of the Grampian Enterprise award which it won for a new artificial lift system for wells.

Europe is risking an energy crisis, according to the Lords EC Select Committee in the UK. In a new report, the committee warned that Europe was too dependent upon oil and gas imports from regions of instability such as the Middle East, Russia and Algeria.

Keltec Petroleum Services has broken into the Venezuelan oil and gas market with the award of a contract from Shell. The firm will provide drilling engineering support for its activities in Lake Maracaibo.

Iran has found alternative

buyers for all but 200,000 b/d of oil since the US imposed economic sanctions last June. According to the Iranian news agency, IRNA, there are no plans to cut production. The spare oil will be placed in storage instead.

16 August

The newly-formed joint venture between Calor Group and SHV Energy of Holland has purchased a 37 percent stake in Brazil's fifth largest LPG distributor, Minagas. The deal, which represents the first overseas investment to be made by the new company, cost £19m.

Russia has forecast an upturn in oil output for the first time in seven years. The Economics Ministry has predicted that production will fall five percent this year to 302m tonnes, but will then rise in 1996 to around 310m tonnes.

Shell evacuated 300 non-essential personnel from the North Sea rig *Leman Alpha* after an outbreak of salmonella on the accommodation vessel, *Safe Supporter*. Almost 40 workers had fallen ill during the previous week.

The Fife field, which is operated by Amerada Hess, has come onstream just 17 months since DTI consent was given for its development plan. The field is located 211 miles off Aberdeen.

17 August

British Gas has offered compensation packages of between £15,000 and £70,000 to 1,500 computer staff in order to persuade them to move to Hoskyns. The French computer company won a £55m outsourcing contract in May to provide British Gas with IT services until the end of 1996.

Eastern Group, which agreed to a £2.5bn bid from Hanson in July, has acquired a 70 stake in part of the North Sea block 43/30 from Amoco. The £12m deal includes a 4.8 percent stake in the Shell-Esso Schooner gas field.

Shell International's public affairs co-ordinator, Tony Brak, is to retire at the end of the year. The company denied that his departure was connected in any way to the PR fiasco surrounding Brent Spar.

The accommodation and utility support platform for BHP's Liverpool Bay development has been installed in the Irish Sea. Part of the three platform complex situated on the Douglas oilfield, the new facility is a converted and refurbished jack-up drilling rig.

18 August

Saga Petroleum has 'shelved' plans to supply Wintershall Gas of Germany with Nkr1.5bn of gas. The U-turn comes after strong pressure from both Statoil and Norsk Hydro to drop the deal.

21 August

BP Exploration announced that an extended well test had been successfully completed on the Schiehallion field, west of Shetland. During a seven-week period, the well flowed at up to 20,000 b/d of 26°API oil, with an average stabilised flow rate of 18,000 b/d.

Aran Energy rejected a \$160m hostile bid by Arco, describing it as 'unsolicited and unwelcome'.

Jordan and Israel have signed an accord which links their research into energy resources. This will include joint studies into the exploitation of oil shale for commercial use.

Oil company teams up with supermarket

Whilst the larger oil companies continue to do battle with the hypermarkets over their ever-decreasing share of the UK retail market, one smaller player has opted for a more co-operative approach.

Adopting the philosophy that 'if you can't beat them, join them, Kuwait Petroleum (Q8) has launched a co-operative pilot scheme with the high street supermarket group Budgens.

The trial, which begins this month, involves two Q8 forecourt stores in Berkshire and Wiltshire. Q8 will maintain ownership and day-to-day management of the stores, whilst Budgens will provide food retail expertise and take responsibility for deliveries from its central distribution depot.

One store will adopt a new, combined logo. The other will commence trading under the Budgens name.

A Q8 spokesman stressed the experimental nature of the link-up. Nevertheless, if the trial is a success, the relationship

could be far-reaching. 'We are not ruling out the option that Budgens may eventually take charge of food retailing at all our 550 outlets nationwide,' he told *Petroleum Review*.

'Budgens simply doesn't have the room or the infrastructure to build its own petrol stations,' commented one industry observer. 'It therefore makes sense to form a partnership with an oil company.'

Some industry sources believe the trial could be the start of a new, more co-operative trend in petrol retailing. 'It's a relationship that makes sense for the smaller players on both sides,' said one. 'Other supermarkets that could benefit from this type of arrangement are Quicksave and Spar.'

Budgens' Chief Executive John van Spreckelsen said, 'This is a new area so we will be taking a cautious approach, but we can certainly see the benefits of an exchange of experience and expertise. Our strength is in running small grocery stores.'

ENI sell-off begins this autumn

The Italian prime minister, Lamberto Dini, has confirmed that up to 15 percent of ENI will be sold off in the autumn.

CS First Boston and Italian banker IMI have been appointed as global co-ordinators for the sale.

Stet, the state-owned telecoms company and Enel, the state electricity company, had originally been scheduled for partial privatisation in the autumn. However, these sell-offs have been delayed because of disagreement in the Italian parliament over precisely how the utilities should be regulated. As a result, ENI has been catapulted to the front of the privatisation queue.

The disposal, which will account for 10-15 percent of the company's assets, is estimated to be worth \$7bn.

GATX gains foothold in China...

GATX has acquired its first foothold in China, with an agreement to purchase a majority stake in one of the country's existing storage terminal facilities.

The storage giant will take a 60 percent share in the facility, which is situated in the Port of Lanshan in the northeastern province of Shandong. The

current owner, Sinochem Shandong Import & Export Corp, will retain a 40 percent stake.

The new joint venture company plans to double the terminal's existing petroleum and chemical handling capacity from approximately 550,000 barrels to in excess of a million. The expansion, which also includes the

construction of a private jetty, will take five years. The terminal is currently linked to the Yanshi Railway by a port authority-owned jetty.

The plan is to open up the terminal to international customers, who currently have no access to public storage in the Shandong province.

New onshore safety rules

New health and safety regulations covering onshore drilling come into force next month.

The main features of the Borehole Sites and Operations Regulations are: a requirement to prepare a risk assessment before work commences and a duty to provide health surveillance where appropriate.

The Health and Safety Executive must also be notified 21 days in advance of both borehole drilling and abandonment.

...and consolidates position in Scotland

GATX will be soon be offering storage facilities on both Scottish coasts.

The company already provides petroleum storage and distribution facilities at its Leith terminal on the east coast. But by early next year it hopes to offer a similar service to west coast customers via a new £5 million fuel distribution base at Rothsay Dock near Clydebank.

Last month, GATX announced that the first phase of construction was complete. When it is finished, the complex will be capable of storing up to 55,000 cu m of diesel, petrol and heating oil.

The company is also eyeing up Glasgow Airport as a potential customer.



Mr John Mather, Executive Chairman of Clydeport plc (left) with Mr Richard Kellaway, Vice President of European Operations at GATX, at the new fuel distribution base on the Clyde.

Neste declares emissions success

Neste's environmental performance over the past few years has 'exceeded all expectations', according to the Finnish oil and chemicals group.

Sulphur dioxide emissions have already been cut to the planned 1998 level, whilst flaring was cut by more than a third last year.

New Saudi oil minister

In a major reshuffle of his government, King Fahd has appointed Mr Ali bin Ibrahim al-Naimi as Saudi oil minister. He replaces Mr Hisham Nazer who held the post for nine years.

Mr al-Naimi, 60, has spent his whole career to date with Saudi Aramco, finally becoming the first Saudi to be president and chief executive in 1988.

It is understood that 'continuity' of oil policies is envisaged. The new minister was responsible for the increase in upstream output at the time of the Gulf War. More recently he initiated the development of the giant Shuaybah oilfield which will give another sizeable boost to production capacity. When this new field comes onstream, it is expected to boost Saudi production capacity from

around 10 million barrels per day (b/d) to at least 11 million b/d.

Mr al-Naimi brings to the post a strong commercial sense and a desire to shape policy rather than to accept royal instructions. Observers are asking whether there will be less willingness to bow to OPEC policy – particularly as it affects production levels.

Another future possibility is greater emphasis on the exploitation of Saudi gas reserves. Currently, other Gulf producers are entering export markets, while Saudi Arabia, with much larger reserves, stands by.

At Saudi Aramco, Mr Abdullah Jumah has been made acting President and Chief Executive. He was previously Vice-President for International Operations.

UK turns off the gas taps

At long last, North Sea operators are beginning to react to the huge glut of gas in the UK market by delaying field developments.

According to a new report from Wood Mackenzie, schedules have already been altered on four fields over the past few weeks. Total's Hunter, Shell's Kingfisher, British Gas's Millon and Conoco's Viking F5 will now come on stream up to two years later than planned.

'Although few in number,' says the report, 'these delays point to the inevitable realisation that more gas fields will only exacerbate the upstream producers' problems of realising low beach prices'.

This summer, short-term packages of gas were trading at around 10 pence/therm in the spot market, compared with 25 pence/therm 18

months previously. As a result, Wood Mackenzie suggests that companies may begin to favour oil developments once more.

The report also warns that the dramatic fall in the price of gas could result in companies defaulting on their contracts or certainly seeking to renegotiate terms.

Uncertainty surrounding the opening-up of the UK domestic sector to competition is one reason for the oversupply. The 1993 MMC report led British Gas to believe it would be supplying all 18 million homes until 2002.

Other causes include: a determination on the part of new suppliers to assure potential customers over security of supply; the shelving of several generation projects; and a series of mild winters.

Restructuring at BP yields results

BP's restructuring over recent years has worked through, bringing outstanding results in the first half of this year.

Replacement cost profit was over 50 percent higher in the first six months of the year, compared with the same period in 1994. At the same time, the dividend was one-third higher. BP is confident that its current improvement in performance can be sustained, thus justifying the increase in the dividend payment.

These latest figures boosted confidence at BP that the target of \$3 billion of replacement cost profit set last year was achievable in 1996. Group Chief Executive John Browne said that by next year a further \$500 million in profits should come from the sale of core assets and the disposal of non-core business.

The excellent results in the second quarter were helped by particularly good figures from the chemicals business – achieving a record operating profit of £258

million in the second quarter, compared with only £45 million in the same period of 1994.

Results were also good from the exploration and production division. Here a raised oil price and operating efficiencies were major contributory factors – since both oil and gas volumes were lower.

However, refining, still suffering from worldwide overcapacity, consequent poor margins as well as warm winter weather, showed less operating profit.

The strong overall operating performance generated a useful cashflow which made possible a further reduction in net debt, which ended the half-year at \$8.4 billion.

For the future Mr Browne believed that chemicals, by now a 'new company', would continue to perform well. Similarly, by concentrating on strengths and new market growth, good results were forecast for the downstream business, though the refining picture

was 'more mixed'.

On the upstream side, oil production is estimated to rise by two percent annually for the next few years. The Harding, Andrew and Foinaven fields are due onstream next year, while phases 1 and 2 of the Cusiana development in Colombia will follow. The

company also has high hopes of Pedernales in Venezuela and has recently announced oil and gas discoveries offshore Vietnam, in the Gulf of Mexico and additional finds in Colombia.

Mr Browne concluded by saying, 'This is a good day. But I do believe that there are even better days to come.'



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Procurement directive cuts UK share of home market

The EU Procurement Directive has damaged Britain's ability to compete in the North Sea market, according to Mackay Consultants.

After a steady four-year rise, Britain's market share dropped by two percent last year to just under 54 percent. 'We believe the Procurement Directive is one of two main reasons for that fall,' says a new report from the Scottish-based consultancy.

Under the new directive, oil companies are obliged to advertise major contracts in the Official Journal of the European Union. Mackay

claims this has resulted in far more international competition in the North Sea, particularly for Britain's fabrication yards.

The recent upsurge in North Sea production has also helped entice extra competition to the region, according to the report. Renewed interest has been particularly strong amongst American oil service companies.

'It is evident that many parts of the industry are still dominated by foreign companies,' concludes the report. Last year, UK firms accounted for less than 27

percent of installation operations in the North Sea and only one-third of transport services.

As in every other year, a large discrepancy exists between the Mackay figures and official statistics supplied by the Offshore Supplies Office (OSO). According to OSO, the UK share of the market added up to almost 80 percent in 1994.

However, this definition includes all foreign-owned companies located in Britain. Whilst these firms create substantial employment opportunities, their profits are of course repatriated.

Power plants back Chilean pipeline

Plans for a 750-mile natural gas pipeline linking Argentina gas reserves with Chilean markets have now received firm backing from potential customers.

The Transgas consortium, led by British Gas and Tenneco Gas, has signed long-term transportation agreements with three US power generation companies. Southern Electric and International Generating Co. each plan to construct one power plant in Chile before the turn of the century. The third signatory, Entergy, has two Chilean plants due onstream over the next six years.

A spokesman said British Gas was now 'optimistic' the project would go ahead but stressed that further complex and detailed negotiations lay ahead.

'Naturally each of the companies involved is trying to get the best deal they can for their country,' he said. The other partners are ENAP, YPF and four other Argentine producers, which collectively hold a 40 percent stake in the project.

Triton sells French activities

US oil production company Triton has sold its subsidiary, Triton France, to French group, Coparex International.

Triton's withdrawal from France is said to be part of the group's strategy of relinquishing peripheral interests and turning financial resources towards the development of the giant Cusiana oilfield in Colombia.

The principal asset of Triton

France is a 50 percent stake in the Villeperdue oilfield, located east of Paris. The field, whose extraction rate is currently declining, comprises some 104 wells, producing 4,500 barrels/day (b/d).

The agreement will give Coparex 100 percent control of the Villeperdue field, the group having already acquired a 50 percent stake from Total in 1993. A subsidiary of French invest-

ment bank, Paribas, Coparex tabled a 1994 turnover of FF922 million.

The group's production output last year totalled 9,700 b/d, of which one-third was from French fields.

According to the French state energy directorate, the country's crude oil production fell by 10.5 percent in the first half of 1995, on the same period last year, to 1.26 million tonnes.

1994 survey of the average lead & sulphur contents of petroleum products delivered into the UK market

Year	Lead Content in g/litre			Sulphur Content in % mass										
	Motor Spirit			Motor Spirit			Kerosine			Fuel Oil				
	4 Star Leaded	Premium Unleaded	Super Unleaded	4 Star Leaded	Premium Unleaded	Super Unleaded	Premium Kerosine	Regular Kerosine	Aviation Kerosine	Auto Diesel	Gas Oil	Light Fuel Oil	Medium Fuel Oil	Heavy Fuel Oil
	Lead g/l	Lead g/l	Lead g/l	S %wt	S %wt	S %wt	S %wt	S %wt	S %wt	S %wt	S %wt	S %wt	S %wt	S %wt
1989	0.143	0.002		0.05	0.03			0.04	0.03	0.19	0.21	1.8	2.2	2.2
1990	0.143	0.002		0.05	0.04			0.04	0.03	0.19	0.21	1.7	2.0	2.2
1991	0.145	0.001		0.04	0.03			0.03	0.04	0.19	0.21	1.4	1.8	2.1
1992	0.143	0.001		0.05	0.03		0.01	0.04	0.05	0.19	0.20	1.8	2.2	2.4
1993	0.143	0.001	0.001	0.04	0.02	0.02	0.01	0.04	0.04	0.19	0.20	2.3	2.5	2.8
1994	0.140	0.001	0.002	0.06	0.03	0.02	0.01	0.03	0.05	0.17	0.18	2.0	2.2	2.4

(Fuel oil figures exclude deliveries for export, bunkers and electricity generation)

Based on weighted average figures provided by UKPIA

Border disputes and the development of trans-boundary energy resources

By John Roberts

Oil and gas basins, like ethnic and religious communities, have an annoying habit of spanning international boundaries. And what makes matters worse is that very often those boundaries are poorly defined or have yet to be delineated and demarcated.

For the next several years, disputes over energy resources can be expected to multiply as the technology for recovering oil and gas from deep sea basins steadily improves. For while most land boundaries have been agreed, either legally or de facto, maritime boundaries remain generally undefined.

Clive Schofield, Deputy Director of the UK International Boundaries Research Unit (IBRU) at Durham University, notes that less than one-third of the world's potential maritime boundaries have been agreed. 'There are around 120 maritime boundary agreements,' he says, 'and a potential for up to 400 globally - including more than 40 in the Mediterranean alone.' IBRU, which has been studying the impact of boundary disputes on specific energy basins for several years, is to hold its 1996 annual conference on the theme of Boundaries and Energy: Problems and Prospects.

The scope is vast. In the Falkland basin, there is the long running dispute as to whether the Falkland Islands are British, or the Islas Malvinas are Argentinian. In the Pacific, there is scope for disputes in the Yellow Sea, the East China Sea, the South China Sea and elsewhere. There are still a number of outstanding disputes in the Gulf, while in the Atlantic the ability of international companies to exploit the resources west of the Shetlands will, in part, be affected by a continuing dispute between Britain and the Danish Crown over the precise boundary between the Shetlands and the Faroe Islands.

Then there are the special cases. Should the Caspian be regarded as a sea or a lake, and does this have relevance to the development of oil resources under its waters?

Nor are all the land disputes resolved. Saudi Arabia and Yemen have yet to resolve their dispute over a 500mile wide stretch of desert and mountain which, on the basis of implicit claims by either side,

includes some of the oil resources now being developed by Yemen.

'Disputes over the jurisdiction of trans-boundary resources, particularly reserves of oil and gas, both offshore and onshore, are increasingly commonplace,' notes Mr Schofield. Such disputes also extend to other forms of energy. The development of dams in such countries as Turkey and Nigeria has worried countries downstream such as Iraq and Syria, and Chad, who fear that the construction dams for hydropower schemes also reduce the volume of water available downstream since water stored behind dams is invariably also used for irrigation by the upstream user.

A body of international law on the resolution of disputes concerning transboundary resources is steadily developing. The Geneva Convention on the Continental Shelf of 1958 laid down in Article 4 that 'If any single geological petroleum structure or petroleum field, or any single geological structure or field of any other mineral deposit, including sand or gravel, extends across the dividing line and the part of such structure or field which is situated on one side of the dividing line is exploitable, wholly or in part, from the other side of the dividing line, the contracting Parties shall, in consultation with the licensees, if any, seek to reach agreement as to the manner in which the structure or field shall be most effectively exploited and the manner in which the proceeds derived therefrom shall be apportioned.'

The same philosophy is contained in subsequent UN General Assembly resolutions, conventions and charters, most notably in the UN Convention on the Law of the Sea (UNCLOS) in 1982. The Law of the Sea convention came into force, following its 60th ratification, last November. It is not binding on the 120-odd member countries, which, at that stage, had yet to ratify it but, even so, large parts of it have effectively passed into customary law and remain the framework for dispute resolution.

The Caspian dilemma

One maritime dispute which may not be covered by UNCLOS is the issue of the Caspian. Until recently, few questioned that the Caspian was a sea, simply on grounds of its size. However, Russia is now argu-

ing that it is a lake, in order to ensure that the provisions of UNCLOS concerning territorial waters and the rights of littoral countries to exclusive economic zones do not apply.

If UNCLOS principles did apply, the Caspian would be effectively partitioned. Moscow is therefore seeking to prove that not only is the Caspian a lake but also that its traditional legal regime has been that it is the common property of the littoral countries. In the past, this meant Imperial Russia or the Soviet Union, and Imperial Iran or the Islamic Republic of Iran; now it means Azerbaijan, Kazakhstan and Turkmenistan as well as Russia and the Islamic Republic.

The reason for this approach is quite simple: the principal proven sub-sea resources are situated some distance off the coast of Azerbaijan, while there are additional prospects off the coast of Kazakhstan. Prospects off the Russian coast look less inviting. If there is, indeed, a common ownership of the Caspian, then, in effect, Moscow would be able to win its argument that having, as the Soviet Union, largely financed the initial development of Azerbaijan's offshore resources, it is entitled to reap the rewards once oil comes on stream in volume.

The Russian case is not conceded by most international analysts, who argue that even if it is a lake, then the normal procedure would be simply for the littoral countries to extend their international frontiers into the lake and so partition it. However, whether or not principles of law and

customary practice elsewhere will apply, may well have more to do with the willingness of Western governments to mount a political challenge to Russia in defence of the interests of international oil companies operating offshore in the Caspian, rather than on Russia's willingness to take its case to any international legal tribunal. The Caspian remains the site of one of the world's most important trans-boundary resource disputes but its solution is more likely to come about through a political settlement than by strict recourse to legal precedent.

The South China Sea

It would appear that the same is true in the South China Sea over which China appears determined to extend its sovereignty. In the last 20 years, the status of a group of normally uninhabited reefs and islets in the South China Sea, the Spratly Chain, has been disputed by no less than six countries: China, Vietnam, Malaysia, Brunei, the Philippines and Taiwan. It was commonly considered that the establishment of small physical stations on the Spratly Islands was because the governments of the surrounding countries considered there were good prospects for substantial hydrocarbon reserves underneath the islands.

It now appears that they were, almost certainly, mistaken. The future of development in the Spratlys almost certainly lies in development of its fishing resources. However, the problem of the Spratly



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Islands has, in the last year, become bound up with a potentially major problem over the development of the Natuna gas field in the far south of the South China Sea.

In recent years, as the only nation in the region that was not directly involved in the Spratly dispute, Indonesia has sought to use its good offices to try and secure a peaceful resolution that would at least allow a degree of cooperation in developing the economic resources of the island group. However, in July 1994, China reiterated in a map its claims in the South China Sea, that essentially involved claiming the whole of the sea beyond a short distance from the mainland shores of Vietnam, East Malaysia and Brunei, and the principal islands of the Philippines.

In the far southwest, this line extended to include the Natuna gas field, which Pertamina and Exxon have recently agreed to develop under a potential \$35 billion joint development programme. Indonesia owns the island of Natuna itself, and neither of its immediate neighbours in the area, Malaysia or Vietnam, had seriously disputed its right to develop the estimated 45 trillion cubic feet of reserves in the Natuna field. For almost a year, Indonesia declined to publicise its response to Beijing's claim, not least because it did not wish to upset what it considered to be a peace process concerning the Spratlys.

That peace process was not only damaged by China's claim to the Natuna field, which meant Indonesia was no longer a dispassionate outsider, but also by Chinese military actions, the most important of which were its occupation of the aptly named Mischief Reef in the Spratlys in February and its subsequent refusal to dismantle its post on the reef, which the Philippines claims to be its territory. It was the first time China has occupied an island that was held, albeit loosely, by one of its neighbours in the Association of South-East Asian Nations (ASEAN).

Mr Schofield considers that joint development of disputed resources is often the best way forward. 'Although states have resorted to the International Court of Justice to resolve what have hitherto proved to be intractable boundary disputes with a resource dimension, the principle is enshrined in international law that any resource straddling a potential boundary should be unitized or equally shared between the parties.' Mr Schofield cites the 1982 UNCLOS convention, which says in Article 74(3):

'Pending agreement... the States concerned, in a spirit of understanding and co-operation, shall make every effort to enter into provisional arrangements of a practical nature and, during this transition period, not to jeopardise or hamper the reaching of the final agreement. Such arrangements shall be without prejudice to the final delimitation.'

Arrangements based on this principle are becoming increasingly widespread says Mr Schofield, citing the Timor Gap zone of cooperation agreement of February 1979, and the agreement concluded between Malaysia and Vietnam in June 1993 defining an area in which the national oil companies of both countries would jointly explore and exploit presumed oil reserves over a 40-year period.

Ian Townsend-Gault, who runs the University of British Columbia's Asia Pacific Ocean Co-operation Programme, considers that the agreements that Malaysia has reached with Thailand and Vietnam for joint development constitute good practical examples of how rivals in an area can co-operate without a full resolution of their differences. In a recent paper he noted that 'The success of joint development arrangements is entirely dependent on the strength of the political will of the parties. Like many such undertakings, the greatest challenge is to make a start. Once momentum has been gained, and especially when positive results are achieved in the form of production, while disputes may arise, it is unlikely that the arrangement itself will come under fundamental attack.'



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Arctic and Atlantic issues

But if progress is being made in some regions of Southeast Asia, elsewhere in the world even close friends are finding it hard to resolve boundary issues where resource development is also involved. In the Beaufort Sea, Canada and the United States have long disputed a 6,600 nautical square mile region into which the Mackenzie Delta oil basin intrudes. During the 1980s the United States sold some leases in the disputed area, but then prohibited actual drilling because of the dispute. Elsewhere in the Arctic, Norway and Russia remain at odds over maritime boundaries and energy resource development in the Barents Sea.

From the Faroes to Rockall

Nearer home, there is a need to settle the dispute between Britain and the Danish Crown over the boundary line between the Faroes and the Shetlands. British Petroleum's decision to go ahead with development of the Foinaven field shows that the area is now ripe for general development, with some of the oilfields located just 11 miles from the disputed zone.

The issue is particularly touchy because the autonomy of the Faroe Islands includes the right to retain any future oil revenues and with a severe downturn in income from fishing, oil looks to be the best prospect for providing the 45,000 islanders with a sound economy. The then British Foreign Secretary, Douglas Hurd, held talks with the Faroese Prime Minister, Edmund Joensen in Copenhagen last February, but there still seems to be little prospect of a resolution to the 16 year old dispute. In essence, the Faroese consider the boundary line should follow the existing demarcation line used to separate respective fishing zones, whereas Britain considers that international precedent favours a line closer to the Faroes. If so, the islanders' prospect of securing significant oil revenues would be diminished, and perhaps completely extinguished.

To the southwest, the question of whether the Islet of Rockall could be used by the United Kingdom as a base point for a 200-mile fishery zone could, in future, have considerable implications for oil and gas development. While the 1988 Continental Shelf Agreement between the United Kingdom and the Irish Republic has effectively resolved their bilateral dispute over claims in the Rockall area, Iceland and the Danish Crown, the latter on behalf of the Faroes, themselves lay claim to considerable areas of the waters which London and Dublin regard as theirs.

Land boundary issues

On land, the failure of parts of Asia to copy the precedent set by the Organisation of African Unity that colonial boundaries should remain intact no matter how arbitrary their origin ensures there will still be a number of major land boundary problems to be resolved that affect resource development. It took a war to impose on Iraq acceptance of a defined land boundary with Kuwait, and even now there must be doubts as to whether future Iraqi regimes will feel bound by Baghdad's pledges last November that it truly recognised the UN delineated and demarcated boundary.

Saudi Arabia and Yemen have embarked on extremely complex negotiations to settle their long-

running boundary dispute which could affect an area roughly one-quarter the size of the Republic of Yemen, as marked on most European maps. The problem is complicated by the fact that there has never been any formal agreement between the authorities in Sanaa or Aden and their counterparts in Riyadh on where the line should be, except for a 1934 agreement between the former (North) Yemeni Imamate and the Saudis which settled the first 150 miles of their border from the Red Sea.

The region's penchant for secrecy could also cause problems down the line. Saudi Arabia has only just deposited with the United Nations the details of its hitherto secret 1974 treaty with the UAE in which the boundary between the Kingdom and the Emirate of Abu Dhabi was settled. This agreement provides for Saudi Arabia to develop all the resources of the Shaybah oilfield, even though between a fifth and a quarter of the field is to be found on the Abu Dhabi side of the line. In the last three months, Saudi Aramco has moved to start the exploitation of the gigantic field – at seven billion barrels, its reserves are more than those of the entire Norwegian North Sea.

But the recent publication of the agreement shows just how great a concession was made by Abu Dhabi in order to secure a settlement of its land boundary with the Kingdom. Moreover, since the agreement runs quite counter to the principles of shared or unshared development embedded in recent international law, there must be a prospect that at some stage the authorities in Abu Dhabi will seek to modify it in order to secure at least some degree of financial return from the oil under their soil which the agreement prevents them from exploiting. A better model, perhaps, might have been the joint Saudi-Kuwaiti development of onshore and offshore oil reserves in the former Neutral Zone.

In the past, offshore drilling was generally confined to inshore areas, thus reducing the scope for disputes concerning sovereignty and boundaries. And where such drilling did take place in waters further offshore – most notably in the Gulf and the North Sea, it furnished a good reason for countries to resolve their maritime boundary disputes. With luck, this process will continue in the years ahead – but not before a number of countries have first sought to stake their claims in waters far beyond their actual coastlines.

As Mr Schofield comments: 'Technology means you can drill farther and farther offshore in deeper water. You therefore have an increase in competing claims in enclosed and semi-enclosed seas, such as the Caspian and South China Sea. Added to this is the increasing potential for hydrocarbons exploration and exploitation in waters that were hitherto considered too deep – for example, offshore Faroes and Shetland Islands.' This opens up a whole new can of worms concerning the development of sea-bed hydrocarbons beyond limits of national jurisdiction.

Meanwhile, there is a persistent incentive for an increasing number of nations to settle their maritime boundary controversies peacefully. For if they remain in dispute, then resources that would once have seemed impossible to develop may remain incapable of development despite all the improvements in deep-sea drilling technology.

Note: The IBRU conference, *Boundaries and Energy: Problems and Prospects*, will be held at the University of Durham from 18-21 July, 1996.

Abandonment : of well-established accounting practice?

By Vivian Pereira, Senior Manager,
Ernst & Young

In January, the Oil Industry Accounting Committee (OIAC) issued a discussion paper which considered the impact of FRS 5, 'Reporting the Substance of Transactions' on upstream oil and gas companies. The most significant proposal put forward in this paper was that existing accounting practice for abandonment is in need of revision. Respondents disagreed and the resulting impasse forced the Accounting Standards Board (ASB) to address the issue in its project on provisions. This article provides an analysis of the OIAC conclusion and highlights the central issue which fired the debate.

Abandonment is the phrase commonly used to describe the dismantling of production and transportation facilities and restoration of producing areas once production has ceased. In the United Kingdom, the holder of a petroleum production licence must obtain the consent of the Secretary of State before drilling a well or erecting a structure for development purposes. In securing development consent, the Department of Trade and Industry (DTI) notifies the licensee of its intention to serve a notice in respect of abandonment or to require an abandonment plan to be submitted. The scale of work ultimately to be undertaken is often not clear at the outset of a development. Indeed over the years, there is evidence that governmental and international requirements in deeper waters have become less onerous than originally anticipated — however, events such as Brent Spar muddy the waters.

Notwithstanding the uncertainty as to what action will be taken, when it will be taken and how much it will cost, in practice UK companies estimate the ultimate abandonment obligation and accrue the expected cost over the life of the field. The periodic charges are accumulated in the balance sheet under 'Provisions for liabilities and charges'. Thus the expected cost is not fully recognised in the balance sheet until the end of life of the field. Changes in estimates of the eventual liability are dealt with prospectively.

So why the need for change? Since its inception, the ASB has been engaged in developing a *Statement of Principles* which is intended to provide a framework to underpin the development of future accounting standards. So far, only a draft version has been published. In contrast to traditional accounting practice which emphasises the need to match revenues against costs and views balance sheet items as the residual of this process, the draft *Statement of Principles*



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Brent Spar

presents a financial reporting model which focuses on the recognition of balance sheet items and envisages that the financial performance of an entity should be derived from the change in its net assets. This switch of focus has begun to permeate into UK accounting standards. The most notable example is FRS 5 which was issued in April 1994.

As its title suggests, the objective of FRS 5 is to ensure that the substance of an entity's transactions is reported in its financial statements. Although its real target was off balance sheet finance, the ASB adopted a general approach of specifying principles applicable to all transactions (subject to a few specific exemptions) rather than detailed rules for specific situations. These principles were largely drawn from the draft *Statement of Principles* and addressed matters such as when to recognise assets and liabilities in the balance sheet and when to remove assets that have previously been recognised. In view of the close interrelationship with the *Statement of Principles* project, the OIAC felt that it was necessary to consider whether the publication of the FRS had inadvertently changed established accounting practice in the industry.

From the outset abandonment was at the top of the list of most vulnerable accounting practices. There was a suspicion that the new balance sheet recognition rules would require the estimated cost of abandonment to be recognised as a liability immediately rather than gradually. To confirm this, two basic questions have to be answered. First, does abandonment meet the ASB's definition of a liability?

Definition of liability

FRS 5 defines liabilities as 'obligations to transfer economic benefits as a result of past transactions or events'. This definition is wider than initial impressions would suggest. The main reason for this is that the ASB's notion of an obligation extends beyond just legal ones. As a result, if there is some circumstance in which an entity is unable to avoid an outflow of resources whether for legal reasons or commercial reasons, it will have a liability. A prime example of this is tax payable on profits reported in the profit and loss account. The draft *Statement of Principles* explains this as follows: 'An entity is considered to have a liability for taxation in respect of events that occurred prior to the balance sheet date (eg trading activities) even though, as a matter of law, the tax does not constitute a liability until it is assessed'. The OIAC felt that such interpretation supported the impression that abandonment is a liability.

Next, did the liability qualify for recognition in the balance sheet? The answer to this hinged on whether it is possible to obtain a reasonably reliable estimate of the obligation. However, what constitutes 'sufficient' reliability is not particularly clear and involves the exercise of judgement. In the case of abandonment, the combined effect of improving technology, the absence of prescriptive abandonment requirements and the difficulty in predicting the likely timing of abandonment clearly makes measurement extremely difficult. But is the level of uncertainty so great to prevent a reasonably accurate estimate from being made?

The OIAC was uneasy about this line of argument. Its main concern was that the excuse would not survive deeper examination. The obvious chink was that estimates of abandonment liabilities had already been made under existing accounting practice. It would not have made sense to suddenly discard them after all these years and particularly now, at the advent of the abandonment era. Furthermore,

The OIAC was uneasy about this line of argument. Its main concern was that the excuse would not survive deeper examination. The obvious chink was that estimates of abandonment liabilities had already been made under existing accounting practice. It would not have made sense to suddenly discard them after all these years and particularly now, at the advent of the abandonment era. Furthermore,

although recent abandonment experience was limited, it could only have had a positive effect on the whole process and bolstered the quality of the estimates. Quite aside from all this, the explanatory part of the FRS notes that 'The effect of prudence is that less reliability of measurement is acceptable when recognising items that involve decreases in equity (eg increases in liabilities) than when recognising items that do not (eg increases in assets). It follows that, particularly for liabilities, where a reasonable estimate of the amount of an item is available, the item should be recognised.'

A home for the debit?

This analysis left the OIAC with the task of finding a home for a rather menacing debit. It seemed illogical to write off the amount immediately in the profit and loss account and so a safe haven had to be found in the balance sheet. For it to fit the ASB's definition of an asset, the expenditure had to contribute to the generation of future cash flows. This notion of an asset can be fairly wide. Take the following example. A factory is an asset because the expenditure incurred to acquire it 'provides the shelter (which would require the payment of rent were the factory not owned) within which goods are manufactured. Only when the goods are sold and the customer pays is the economic benefit resulting from the use of the factory realised in terms of cash flow'. In the same way, platforms and other facilities are necessary for the development of reserves and eventual sale of oil and gas and therefore the expenditure incurred in their installation (including abandonment) contributes to the generation of future cash flows, albeit indirectly.

Although it may appear fairly dramatic, I suspect that grossing up the balance sheet for the full abandonment obligation is unlikely to have major commercial consequences. The OIAC identified three principal areas of concern. Firstly, would existing loan covenants be impacted? The British Bankers' Association recently confirmed that member banks did not consider that immediate recognition would create problems insofar as existing banking covenants are concerned. Secondly, the increased balance sheet volatility arising from changes in estimates of the eventual obligation. Whilst this is inevitable, it is debatable whether the resulting volatility will be much more pronounced than that caused by, for example, revaluations of fixed assets. And finally, comparability with international accounting practice. This may not be a problem. In the United States, the Financial Accounting Standards Board (FASB) plans to issue an exposure draft on accounting for nuclear decommissioning costs later this year. The FASB's tentative conclusions are pointing towards grossing up. This project may ultimately impact the US oil and gas industry.

Still under debate

If the current version of the ASB's draft *Statement of Principles* is to be the backbone of UK financial reporting, existing practice for abandonment liabilities is unlikely to survive for much longer. Respondents to the OIAC discussion paper unanimously rejected the proposal for change and preferred to stick with existing practice. In doing so, the majority of them expressed surprise that the treatment of abandonment had been impacted by FRS 5 and that unfortunately tended to dictate the overall flavour of their response. However, it appears that the real grievance is with the ASB's basic approach to financial accounting. If that is the case, the ASB should be informed in unequivocal terms at the next opportunity. In the meantime, continue with present accounting practice until further notice.



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What if the Labour party comes to power....

With the Labour party way ahead in the opinion polls, *Petroleum Review* sought out opposition spokesman Martin O'Neill MP to discover how the oil industry would fare under a Blairist regime in Britain.

Susannah Cardy: Does the oil industry trust the Labour party?

Martin O'Neill: Those in the industry who are long in the tooth can remember back to the 1970s when a Labour government set up the whole regime in the North Sea. Although we didn't reap the benefit of the tax returns, the oil community was able to do business with us then and I believe they're quite confident they can do business with us now.

But are any companies telling you that they positively want a Labour government?

There are a number of them who say it wouldn't make an awful lot of difference and that the antagonisms which existed between business and the Labour party in the mid to late 1980s no longer exist. They obviously don't know us well enough to be sure we can deliver what we say but many do feel the present government has lost its way. There's

a sense of frustration with the Conservatives, and particularly with its mismanagement of the economy in the late 1980s and early 1990s. So I don't think the oil industry is ill-disposed to change.

There are also a number of people in the business who have rediscovered that they used to vote Labour. The energy business is by and large a meritocratic one, in the sense that people get where they are because of their qualifications

or their ability to do the job not because of who their fathers were. It doesn't have as much of the built-in prejudices that exist in other parts of British business. I went to Heriot-Watt University and the petroleum engineer students there were pretty ordinary guys, but they're now holding down senior jobs in the business. And they came from backgrounds not dissimilar from my own: grammar school, 1960s people. They're not necessarily gut Tories.

This is also the industry which, perhaps more than any other, has paid out in terms of taxation. This taxation may not have been excessive in terms of rate but it certainly has been in terms of revenue, and many feel that more of this money should have gone towards enhancing the industrial structure of Britain. Instead, it was given away in tax cuts.

Would Labour revive the energy department?

My own experience tells me there is a majority in favour of restoring this department. The trouble is that energy is just not at the forefront of the DTI's preoccupations. If there had been a Department of Energy with a cabinet minister in charge, I think the whole Brent Spar affair would have been handled with far more sensitivity.

At the same time, there is a certain synergy between trade and industry and energy.... I would favour the formation of another energy department on balance, but it's not something I would go to the stake over.

In what sense do your energy policies differ from the Tories?

Their simplistic commitment to competition and the notion that the market will resolve virtually everything is where we part company straightaway. We recognise there is a role for competition but we also recognise that government has a responsibility to ensure there are sufficient energy supplies and that we don't waste our natural assets. We want to lay down the sorts of structures which the Conservatives have largely done for health and safety. But we want them for the environment and for fuel mix management. They wouldn't be set in stone like one of Stalin's five-year plans but they would simply lay down general rules and guidelines.

So would you seek to alter Britain's basic fuel mix?

I think the Conservatives have had a rather simplistic love affair with gas. Labour takes the view that burning gas is one of the most efficient means of generating electricity but it is not necessarily the most efficient means of exploiting gas.

And we don't want to see such a shift from coal to gas that we are no longer able to take advantage of the coal reserves that we have in Britain. The Conservatives take the view that if you have diversity of supply and competition then you can keep prices down and the consumer benefits. Yet at the time of the dash for gas, coal was displaced to such an extent that certain coal fields ceased to be viable in terms of the economics of that particular time. In the longer term, this means we are likely to be denied access to some of these fields.

The Labour party is certainly predisposed to the coal industry in a way that the Conservatives are not. I think the pit closures in 1992/93 were motivated at least in part by an antipathy towards the miners.

So would you invest money in coal-burning?

The difficulty is that to introduce flue gas desulphurisation into coal-burning power stations which are presently in mid-life would not be economically viable. On the other hand, we do believe that within

'I think the Conservatives have had a rather simplistic love affair with gas'

the next five years or so clean coal technologies will develop to such an extent that it will become appropriate for Britain to invest in them. We certainly think it's worth providing pump priming money for clean coal technology. We wouldn't act as lead investor but rather as a joint venture partner with private companies.

How much backing will you give to alternative fuels?

The non fossil fuel obligation should continue but we would like to see it run under a less bureaucratic regime. Vetting can take so long that the initial enthusiasm behind proposals is sometimes lost or the economics changed. We would also like to see more money being invested in order to achieve the kind of critical mass in some of these technologies which would enable us to produce them in Britain.

The break up of the CEEB was a huge boost for alternative fuels. Its traditional approach was to build the largest possible generating station as near to its fuel source as possible. But the trend now is away from gigantism towards more localised forms of generation and I believe alternative fuels will be in the vanguard of this movement.

What are you looking at in particular?

I'm a little bit cautious about wind power. There are a number of environmental considerations and local objections from communities which have to be taken into account. Waste-to-heat is a good fuel for urban areas, although I'm somewhat cautious because lobbyists argue that you don't really help the environment by putting everything up a chimney.

Sufficient section 36 permissions have been granted to cover the first 18 months or so of a Labour government. This would give time for a full discussion on the whole issue of fuel mix management once we come to power, during which time we will give serious consideration to a new policy.

Was Shell right to opt for dumping Brent Spar at sea?

I'm not certain. I'm not competent to say because I'm not a scientist. But what I am not happy about is the way the whole issue was handled. It smacked of a deal struck between a Conservative government and a major oil company, in which the environment took second place over commercial considerations. Shell then allowed lobbyists in Germany to misrepresent them and to create conditions in which they lost a substantial share of the German market. This, in turn, created a commercial imperative, which overrode scientific considerations.

So how would Labour have approached the issue?

It's a bit like the man who, when asked the way to Cork, replied, 'Well I wouldn't have started from here'. There was insufficient transparency in the whole process: the decision was made behind closed doors and presented as a *fait accompli*. Labour would have had a regime in place which would have kept the public informed at every stage. The whole issue of abandonment should have been discussed across the scientific, technical and environmental communities. Instead, attention was focused on one particular structure.

Do you sympathise with the UK oil industry when it



complains that environmental legislation coming out of Europe is excessive and unrealistic?

The agenda is often written for the North Sea oil industry by countries which have no interest in it. Indeed, one might cynically say they have an interest in making the agenda as disadvantageous as possible.

But the real problem for Britain is that our standing is now so low within the European Community that even when we do have a good case it gets ignored on the grounds that 'It is just the Brits whingeing again'. The Working Hours Directive is a case in point. I get the impression that we're losing arguments by default and I would like to redress that balance when Labour comes to power.

At the same time, I must point out that an industry which takes full advantage of Britain not signing up to the Social Chapter and which doesn't recognise trade unions, is an industry which is not going to secure a lot of sympathy in Europe.

Do you accept that the refiners have had a particularly tough time?

Oh, people are always hard done by. It's not just the British farmers who say this, it's every sector of industry. One of the first things you acquire as a politician dealing with industrial and economic matters is a large bag of salt which you place on the table whenever you're speaking to anybody about their concerns. I'm a wee bit cynical. I've been in Parliament for 16 years and I've heard all the bleeding-heart stories.

Of course I have some sympathy and I think

**Martin O'Neill
MP**

the refiners have done a great deal to clean up their act. The product's improving too, but it could still be better.

What is your policy on transport?

We want to get people into public transport and support battery power. People tell us that, with a little more pump priming, we could develop British batteries as good as any in the world. We must also look at

clean burn engines. It's worrying that a number of foreign car manufacturers construct cleaner burning cars for their own countries than for Britain.

'I've been in parliament for 16 years and I've heard all the bleeding heart stories'

Has Clare Spottiswoode done a good job at Ofgas?

It's too early to say. I think she's brought a fresher approach to Ofgas than some of her predecessors. By the same token, some believe she lacks the business credibility which her predecessor had and which it's quite clear her electricity counterpart does not have.

The perception of her commercial experience is that it is somewhat limited. This is reinforced by the academic and civil service background of the people who advise her. Both energy regulators are faced with very skilled and well-paid analysts battling on behalf of the commercial companies and, frankly, I don't think they have the people to take them on.

British Gas and the independents also complain that Clare Spottiswoode doesn't appreciate their problems. She may be trying hard but she is surrounded by people who are far too committed to a simplistic view of the market and who believe that perfect competition is attainable. They're imposing burdens upon the commercial operators which are unrealistic.

I also think Ofgas should take greater account of environmental questions and grasp the nettle of the E-factor, which I don't think Clare Spottiswoode is prepared to deal with. I've had a number of friendly but controversial discussions with her over this.

'Some believe Clare Spottiswoode lacks the business credibility of her predecessor'

So would you introduce a panel of advisers into Ofgas?

The business expertise is not there and one solution to this would be to have a panel of advisers.

The opposition has been relatively quiet throughout the parliamentary debate over domestic gas competition. Are you happy with the whole process?

We are opposed to private monopoly, so we are in favour of deregulating the gas market provided there are safeguards. However, we opposed the Bill at third reading because not enough emphasis had been placed upon primary legislation. Too many safety, environmental and consumer safeguards are dependent upon the licences. This means that licences can then be amended and Parliament ignored.

It's quite clear that the well-informed, middle-

class consumers living in big houses who can pay their bills on time will benefit from having a choice of contract. But we are not confident that the elderly, disabled or poor will benefit. The poor have not even been given proper status in the legislation - Ofgas is not obliged to look after them in any specific way at all.

We will be watching the trial licence periods very closely. We wanted to have reports made to Parliament that could have led to a re-opening of the legislation if the trials threw up problems. Yet at the moment, there is no requirement for the regulator to come back to Parliament in the event of things going wrong.

Will you make alterations to the Gas Act if you come to power?

We would have to re-consider the whole question of utility regulation. Is it appropriate to introduce piecemeal legislation as and when the opportunities arise or should we go for a grand restructuring of the legislation? At the moment, we just don't know. We're highlighting the shortcomings of the present system with the aim of making improvements when we have the opportunity.

Would Labour increase taxation for the oil and gas industry?

We would always consider whether the British tax payer is entitled to a greater share. But at the moment we have no special plans to increase taxation offshore. When we come to power we intend to consult widely with the industry. CRINE has been a great success, for example, and we must ensure that we don't kill the goose that lays the golden egg.

Having carried out a consultation exercise, we would then decide on the most effective and appropriate way of raising revenue. We don't expect to be universally popular but if we do opt for extra taxes, we are determined that it would be a one-off change. Stability would then be restored for the lifetime of that government.

We certainly don't want a repeat of the sort of crude exercise that the Tories were guilty of over PRT, when the Treasury rode roughshod over the DTI. As I understand it, the DTI was informed of the decision only 36 hours before the official announcement was made.

We will be approaching the whole question of taxation with far more caution. The extra potential revenue is not on such a scale to warrant diving in immediately.

Would you limit the spread of the hypermarkets?

As a consumer I find it very convenient to buy my petrol from the hypermarkets because they're cheaper than the oil company outlets. There is increasing cynicism over the price differential between oil company-owned petrol stations located near hypermarkets and those further away. The journey I make to and from my constituency require me to pass about six or seven different petrol stations, and the closer you get to Sainsbury's the cheaper the petrol becomes.

It also seems fairly logical to me to shop when you fill up for petrol. Perhaps what the majors are really kicking themselves over is the fact that they never got in on the act in the first place. And this comes down to the arrogance that is so often a part of the marketing thinking of these companies.

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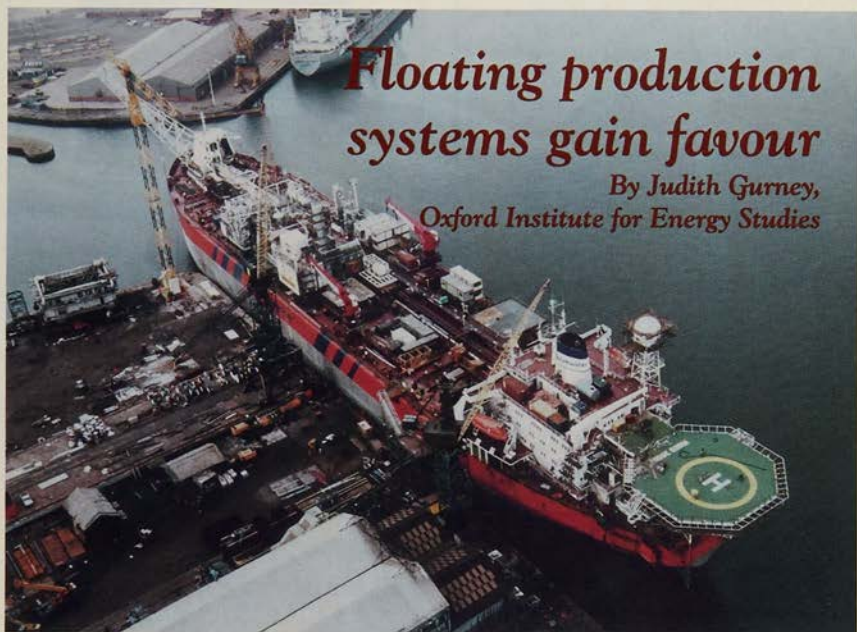
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Floating production systems gain favour

By Judith Gurney,
Oxford Institute for Energy Studies

The use of Floating Production Storage and Offloading (FPSO) vessels to develop UK offshore oil fields looks certain to increase. Of the 64 new offshore fields due for development in the next few years, 15 are expected to use FPSO vessels for their production, according to Wood Mackenzie, the Edinburgh-based consultants. Most of these are small, short-life fields in the central North Sea which would not justify investment in a fixed platform. Three, however, are large fields west of Shetland and one, the Foinaven field, is scheduled to be the first commercial development in this area, perhaps setting a precedent. Floating production systems with substantial storage capacity can be the best option in deepwater locations which are remote from existing infrastructure, where the cost of an export pipeline would be prohibitive.

Floating production systems have been used to develop offshore fields in the Far East, Latin America and the Gulf of Mexico for more than a decade but technical improvements in subsea production methods and turret design were necessary before their introduction to the severe weather conditions of the North Sea. The attraction of these systems lies in cost considerations. The price of a new FPSO vessel, or a tanker conversion, is far less than that of a fixed production rig and there is also the option of leasing rather than ownership. As a general rule, leasing is favoured for short-life fields, whereas ownership is preferred for longer-life fields.

Even when an operator opts for ownership, the comparatively short construction time for a FPSO vessel makes it possible to start production quickly and thereby realise an early positive cash flow. With fast-track parallel engineering, production can begin before final information is in regarding the extent of a field's recoverable reserves. In the maturing North Sea province, with the present low price of oil and the often small margin between revenue and operating costs, the ability to develop a field in a prompt and cost effective way may be decisive. Another advantage of floating production systems which the Brent Spar experience has emphasized is the limitation of abandonment costs to subsea wells and their fixtures.

A floating production system development plan can sometimes serve as a stalking horse for a field which could also be developed through a tie-in to a

nearby existing production system operated by another oil company. There have been cases where a threat to use a FPSO vessel has led to a financially satisfactory tie-in arrangement which would probably have not been offered had there not been an alternative production method on the table.

Design features

A FPSO vessel differs from a semi-submersible, which has limited carrying or storage capacity, and from a Floating Storage Unit (FSU) vessel, which lacks sophisticated processing capabilities, although the distinction is sometimes blurred. The design of its turret, to which the mooring lines and anchors are attached and through which the risers pass, allows it to function in North Sea weather conditions. The turret's bearing system allows the vessel to 'weather vane' and rotate around it in accordance with wind and weather conditions, so that the vessel always lies head into the wind. An advanced design FPSO vessel contains facilities for processing, storage, water and gas injection and gas flaring. Although produced gas is generally used for power production and reinjected, with the excess flared, pipeline export to nearby main gas export pipelines has been arranged in at least one case where gas production was sub-

stantial. The vessel has a helicopter deck and an accommodation area, and requires shuttle tankers for the delivery of produced oil to shore.

Leased FPSO vessels

Petrojarl I is generally considered to be the first standard FPSO vessel to produce a UK offshore field entirely. At the end of 1991, it began production of Amerada Hess's Angus field, one of the smallest stand-alone oilfields in the UK North Sea. Amerada Hess leased Petrojarl I, and its shuttle tanker *Petroskald*, from Golar-Nor Offshore of Trondheim, Norway, a contractor specialised in the design, construction, finance and operation of floating production systems. Nippon Kokan of Japan built Petrojarl I for Golar-Nor in 1986. Its first assignment was at the Norsk Hydro Oseberg Field and it was used subsequently for production on Conoco's Lyell field, Shell's Fulmar field, Norsk Hydro's Troll field and Esso Norge's Balder field. Before its Angus assignment Golar Nor modified Petrojarl I so it could produce from several subsea wells and improved its NGL recovery and water-holding capability. On Angus it produced 40,000 b/d, stored up to 189,000 barrels and had a produced water capacity of 23,500 b/d. It accommodated a crew of 42.

Petrojarl 1



Amerada Hess's lease ran for two years with an option for extension should the field life of Angus be prolonged. Production in fact ended in June 1993 with 10.6 million barrels recovered, some 3.1 million barrels more than the original estimate of recoverable reserves. Up time exceeding 97 percent was also well above expectations. Amerada Hess viewed the project as successful. The field was brought on stream barely a month after Department of Trade and Industry approval of its development plan, and the company's overall capital expenditure was only £20 million in money-of-the-day terms. Operating costs included a hire charge of £45 million over field life for the FPSO vessel and shuttle, while direct costs averaged £2.5 million per annum. Abandonment of two appraisal wells which were recompleted as producing wells and of the original exploration well, including recovery of the well-heads and general seabed clearance by Stena Offshore, cost some £3 million. The company made a profit of £38 million, discounted using 12.5 percent per annum.

On the strength of these results, Amerada Hess leased Petrojarl I to develop the first phase of its Hudson field in the northern North Sea. Hudson is larger than Angus, with estimated recoverable reserves of 87 million barrels. Its development involved two phases, with Petrojarl I producing from two wells during the first-phase while the second-phase system of subsea production tied back to existing infrastructure on the nearby Shell/Esso's Tern platform was set up. First-phase Q production began in the summer of 1993, only 22 days after Petrojarl I left Angus, and soon averaged 38,000 b/d, with a second Golar-Nor shuttle tanker, *Petrotroll*, involved in the operation. Gas lift was added to Petrojarl I in April 1994, according to Amerada-Hess specifications, while it was still on Hudson.

ARCO leased Petrojarl I, when it had completed its stint at Hudson, to develop the Blenheim field, located in the central North Sea with estimated recoverable reserves of 23 million barrels and an estimated field life of three and a half years. Production of Blenheim began in March 1995.

BP's Seillean



Golar-Nor, which plans more advanced vessels able to accommodate production from numerous subsea wells, designs and builds its Petrojarls only when contracts have been signed. It is currently overseeing the construction of Petrojarl IV for use by the GolarNor/McDermott partnership in the development of British Petroleum's Foinaven field. A second, smaller Petrojarl may also be used at Foinaven.

Company-owned vessels

British Petroleum is using a purpose-built FPSO prototype vessel to develop the small Cyrus and Donan fields, with estimated recoverable reserves of 31 and 24 million barrels respectively. Its Seillean is able to produce only 16,500 b/d and has a storage capacity of just 30,000 barrels. It is not equipped to offload production at sea and has to disengage from the wellhead when its storage capacity is full to discharge at a shore terminal. Seillean began producing Cyrus in 1990 and suspended production in 1992 when it moved to begin production in Donan. Production in Cyrus is scheduled to resume in 1997.

Kerr-McGee's Gryphon Alpha, built in Cadiz, Spain, began producing the Gryphon field in 1993. Gryphon is a fairly large field, with estimated recoverable reserves of 120 million barrels and an estimated field life of 12 years. Gryphon Alpha is larger than Petrojarl I, with accommodation for 104 people and a 60,000 b/d processing capability. It has a somewhat different turret design, with computer systems designed to keep the vessel precisely on station. Kerr-McGee cites the short schedule to first oil production as an important reason for its decision to use a floating production system, as well as the fact that the field has a very heavy crude which would be difficult to put into a pipeline system.

Texaco is planning to use a purpose-built FPSO vessel to develop its central North Sea Captain field with estimated recoverable reserves of 350 million barrels and an estimated field life of 18 years. The vessel is being built in Cadiz and will have a production capacity of 60,000 b/d. The Captain field is

split into two regions, with the development of the second region by subsea satellite planned for the fourth year after the start of production in the first region. It has a low gas-to-oil ratio and any gas produced will be used for power generation on the FPSO vessel.

Shell UK Exploration and Production received DTI approval in March 1995 to develop its Teal, South Teal and Guillemot A fields in the central North Sea using a floating production system. The purpose-built FPSO vessel will be able to process 55,000 b/d, store 850,000 barrels, inject 85,000 b/d of water and export gas to the Fulmar export pipeline. The three fields are small and within a few miles of each other. Teal holds estimated recoverable reserves of 37 million barrels of oil and 24 billion cubic feet of gas. South Teal holds estimated recoverable reserves of 8 million barrels of oil and 5 bcf of gas and Guillemot A an estimated 47 mil-

lion barrels of oil and 18 bcf gas. Production is scheduled to begin in 1997 with the Shell FPSO vessel moored midway between Teal and Guillemot A with subsea wells in the three fields linked to the FPSO vessel by flexible risers. Four shuttle tankers will transfer the oil to shore. The hull will be constructed in Japan and the top-sides in Tyneside. Shell may also use this FPSO vessel, or another, to develop Guillemot B, Mallard and other central North Sea fields.

Conoco is considering the use of a purpose-built or leased FPSO vessel for the MacCulloch field in the central North Sea, with estimated reserves of 80 million barrels and an estimated field life of five years. The final decision, like that of all the probable floating production system users identified by Wood Mackenzie, will not be known until the DTI approves development plans. Some may decide to use a tie-back system; this seems to be the case with Marathon in the Brae West field.

Contractor as operator

Amerada-Hess has made an unusual arrangement for the development of the Fife field which, like Angus, lies close to the UK/Denmark median line. Fife's estimated recoverable reserves are 34 million barrels and its estimated field life is four years. The absence of existing export infrastructures and its experience at Angus and Hudson encouraged Amerada-Hess to opt for a floating production system for Fife. In 1993, it reached an agreement with the Bluewater Group in the Netherlands for the charter of a FPSO vessel, a plan approved subsequently by the DTI.

Once the agreement was signed, Bluewater, formerly a part of the Heerema Group, ordered the hull conversion of a 10-year-old tanker in Cadiz and top-side outfitting in Tyneside. The FPSO vessel *Uisge Gorm*, which sailed out to Fife in mid-July, has a storage capacity of 620,000 barrels, a production capacity of 50,000 b/d, and facilities for crude stabilisation, water injection and gas lift. It has nine anchors, five risers and the capacity for tie-in of eight wells.

What is exceptional at Fife is the fact that Bluewater has operational control of production from the wellhead to the shore, although there will be an Amerada-Hess official on board the *Uisge Gorm* who can order an emergency shutdown if

Probable floating production system use

Field	Operator	Start-up	Location	mbbls	Estimated bcf
Oilfields					
Banff	Ranger	1998	CNS	50	
Glaire	BP	2000	WOS	150	
Dauntless	Amerada	1998	CNS	50	
Durward	Amerada	1998	CNS	40	
Foinaven	BP	1997	WOS	200	
Kyle	Mobil	1998	CNS	75	
MacCulloch	Conoco	1996	CNS	80	
Schiehallion	BP	1998	WOS	375	
Sedwick	Enterprise	1996	CNS	30	
Solan	Amerada	1998	WOS	50	
Oil & gas fields					
Brae-West	Marathon	1996	CNS	15	50
Buckland	Conoco	1999	NNS	20	25
Medan	BP	1999	CNS	30	50
Pierce	Ranger	1999	CNS	30	50
Gas/Condensate fields					
Alder	Texaco	1998	CNS	*	13

*85 NGL/Condensate mbbls

Source: Wood Mackenzie North Sea Report No. 264, April 1995

necessary. Bluewater will be responsible for the provision and day-to-day operation of all production facilities, including the flowlines, risers and umbilicals as well as the facilities on the *Uisge Gorm*. The contract signed with Amerada Hess, which includes Bluewater's provision of shuttle tankers, runs four years and can be extended to seven years if Fife's reserves exceed expectations. The contract may also be extended if Amerada Hess goes ahead with plans to develop the small nearby Fergus field, with reserves estimated at only 10 million barrels, via a subsea tie-back to the Fife facilities.

Not the only option

Floating production systems are not always the preferred choice, even for small fields. A DTI report issued at the beginning of 1995 suggested that they were not advisable for fields with a high gas-to-oil ratio, or ones with high pressure or low productivity. It suggested that expected improvements in subsea technologies would make other systems, such as a Multi-Oilfield Production System (MOPS), a better option in some cases. In addition, there is always a slight chance of spillage during the loading and offloading of production from floating production systems – the occurrence of a major accident could lead to an environmental protest against their use. There is no doubt, however, that the trend in offshore production in the UK North Sea, as elsewhere, is moving away from the use of large, fixed production platforms. Perhaps this is just as well, given the headaches caused by what to do with these platforms when they are no longer needed on the field.



Oil flows from Papua New Guinea

By William Scholes

The impending development of the South East Gobe and Gobe oilfields will be Papua New Guinea's second commercial fields. At a recent conference on mining and petroleum investment in Papua New Guinea, Peter Botten, Managing Director, Oil Search Ltd, described the Gobe/SE Gobe as very much a test for investor development in Papua New Guinea.

'Expectations for the second development at South East Gobe and Gobe are high. Substantial progress is being made to bring this project on stream as soon as possible,' he said. He added that it was particularly encouraging to see that the new development was receiving full support from all parties concerned and the project is on track for a production licence application later this year and first oil in mid-1997. The construction phase would follow immediately after PDL application approval and was estimated to last 16 months.

Drilling costs, based on published reserves and \$US300 million development costs, were likely to be a conservative \$US4.28 a barrel.

Shared facility costs, for example the Central Processing Facility, would be divided proportionately to each field's nominated capacity requirement. Indirect costs, such as project management and engineering services, will be shared by each group proportionately to the respective field's direct costs plus shared costs as a percent of the total.

SE Gobe and Gobe

The Gobe Petroleum Development Project includes the development of

two separate oilfields, SE Gobe and Gobe Main.

The fields are located in the northwestern area of Petroleum Prospecting Licence PPL 161 and south-eastern area of PPL 161 in the Gulf and Southern Highlands Provinces, 85 kilometres southeast of the Kutubu oilfields.

The Gobe Main field is located entirely within the Petroleum Prospecting Licence PPL 161 which is operated by Chevron Niugini (25 percent). Other PPL 161 participants include Ampolex (PMNG Petroleum) Inc. (21.23 percent), BHP Petroleum (PNG) Inc. (12.50 percent), BP Exploration Operating Company Limited (25 percent) and Oil Search Limited (10.02 percent).

The SE Gobe Field is located within both PPL 56 and PPL 161. The PPL 56 licence is operated by Barracuda Pty Limited (20 percent). Other PPL 56 participants include Mountains West Exploration Inc. (2.5 percent), Nomeco PNG Oil Co (7 percent), Oil Search Limited (20 percent), Southern Highlands Petroleum Co Ltd (50.5 percent).

Both of the fields are approximately 15 kilometres away from the existing Kutubu oil export pipeline. The pipeline right-of-way will provide convenient access to the project area.

Kutubu, PNG's first oilfield, operated by Chevron, now produces about 120,000 barrels of oil per day, piped by gravity flow 365 kilometres from the Southern Highlands to a terminal at the Gulf of Papua.

The Gobe/SE Gobe field will also be operated by Chevron. A 15 kilometre spur will be built to the Kutubu pipeline.

Gas potential

Hides, in the Central Highlands, PNG's first producing gas field, operated by BP, supplies wet gas to a 42 MW gas turbine power station, which transmits electricity by a 74-kilometre overhead line to the Porgera mine.

The brightest future lies in PNG's gas potential, according to Ian Rushby, General Manager, Global Gas, BP Exploration. He recently painted a glowing scenario of the future with LNG being produced.

'The total budget for the project exceeds \$US9 billion. Investment in it equates to almost twice the PNG GDP in 1995,' he said.

'The development incorporates production facilities in the Hides area, a gas processing plant in the Tagari Valley, a trunk pipeline to the coast, LNG liquefaction plant and a fleet of purpose-built LNG tankers.

'The construction phase requires an operational workforce of more than 10,000 people. The volume of gas produced every day is equivalent to four times the average daily consumption in the whole of Sydney; over 50 times the total power requirement of PNG today'.

Such a resource, Mr Rushby and others believe, does exist in PNG, probably at Hides. But international competition for such investment is considerable and requires a degree of stability not yet present. It also requires a sound policy regime; and PNG's recently announced gas policy involves a government right to 22.5 percent of the project - gas reserves are currently put at 15.14 Tcf with about 199 million barrels of associated condensate.

High above the clouds, in one of the most rugged and remote terrains in the Asia/Pacific region a drilling team, under contract to joint venture partners BP, Exxon and Oil Search, recently drew a blank with Karius-1 well.

The well was the first to test the potential of the large Karius anticline, a twin structure to the nearby Hides anticline which was responsible for providing Papua New Guinea with its first hydrocarbon production development and where a gas column in excess of 1,000 metres has already been discovered by the Hides-3 well.

Paul Wilkins, BP's PNG LNG manager, said the well had provided valuable information and the potential still remained for the field to be of a size capable of supporting a LNG project of the Hides-Karius resource.

The Karius site is 2,600 metres above sea level and 4 kilometres from the Hides gasfield. Drilling is now starting on another well - Papua IX is in the same PNG licence area as Karius-1 but Chevron's PPL 161 JV will share exploration costs with PPL 138 joint venturers Exxon, Oil Search and BP.

Another player is Command Petroleum, which has been exploring in PPL-139 in the Papuan fold belt for three and a half years. In 1991 Command struck oil in SE Gobe-1 in PPL-56. It sold its share of the permit in September 1992 to Oil Search Ltd for \$A20.9 million.

In the fold belt in PPL-139 Command has conducted two seismic surveys, the 80km Mena River survey and the 35km Ierbi Divide survey.

First refinery

Construction has started on the country's first oil refinery - on Motukea Island, Fairfax Harbour, Port Moresby. The refinery will have a capacity of 40,000 b/d crude oil. Products will include petrol, diesel, jet fuel, kerosene, fuel oil and LPG.

The capital cost will be \$US220 million. The refinery sponsor is PNG Oil Refinery Ltd, a local company acting for the developers CMPS&F, PetroFac, Curtin Bros, under project management with PNG government. Production is scheduled to start in mid-1997.

Legislative changes

Recently the PNG resource sector has been concerned over changes to mining and petroleum royalty and equity agreements. The government suggested that equity landowners would be offered 10 percent from the state's 30 percent entitlement in major mining projects, 5 percent of which will be free of cost.

For major petroleum projects the landowners will be given 2 percent free of cost. The cost of landowners' equity will be met by the state and other participants in proportion to their shareholding in the project.

The rate of royalty will be increased from the current level of 1.25 percent to 2 percent in respect of both mining and petroleum projects. While the royalty increase has led to an outcry, it is suggested the free equity has caused most consternation, particularly uncertainty about how the new system will work. Clear guidelines have still to be established. Mining and Petroleum Minister John Giheno said the equity charges had been introduced to help defuse future problems with landowners.

New discovery

Oil and gas has been discovered in the wildcat Makas IX in the central Highlands. Oil Search Ltd said oil and gas had been recovered over a 328-metre interval from 861 metres to 1,189 metres.

Results surprised the joint venturers because they were produced from a geological zone which was neither the primary nor secondary target for the operator Chevron which has a 25 percent interest in the permit. Oil Search has 35 percent and Ampolex 21.23 percent. Makas IX will proceed to the target zone, the Torro formation, at a depth of between 2,000 metres and 2,500 metres. Oil Search and Ampolex said another well may have to be drilled to test the top zone.

The other partners are BHP Petroleum with 12.5 percent and Merlin Petroleum 6.25 percent. Makas IX is in the Ieru formation in PPL 161, about 12 kilometres north of the major Gobe oilfield and thus is close to the existing oil and gas infrastructure, should it prove to be an economic find.

Mr Botten said the discovery was particularly pleasing because Oil Search had paid \$A72 million in January to add a further 25 percent to its stake in PPL 161, the exploration licence which covers the twin Highlands commercial oil finds, Gobe and South Gobe and now the Makas discovery.



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3 EMPLOYMENT STATUS

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4 TYPE OF ORGANISATION

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6 INTERESTS

PLEASE INDICATE, USING THE CODE NUMBERS IN '5' ABOVE, THE THREE SUBJECT AREAS WHICH MOST INTEREST YOU:

- ☐ ☐ ☐

7 IS / WAS YOUR WORK PRIMARILY: ☐ UPSTREAM? ☐ DOWNSTREAM? ☐ BOTH?

DATES FOR YOUR DIARY



'Environmental aspects of petroleum fuel quality'

Thursday 14 September 1995,
at 17.30 (tea will be served from
17.00)

Speaker: John Feltham, DTI

John Feltham is the Chair of BSI PT1/2 committee, which deals with fuel specifications for the United Kingdom. In addition he is Convenor of CEN TC 19 WG24, the European Working Group responsible for the development of the European standard for diesel fuel.

Organised by Environment Discussion Group
IP Contact: John Phipps



'Current upstream activity in Libya'

Tuesday 19 September 1995,
at 17.00 for 17.30

Speaker: Judith Gurney, Research
Fellow, Oxford Institute for Energy
Studies

There is renewed interest in the exploration and production potential in this politically isolated country despite the problems posed by the US and UN sanctions specifically designed to hamper activities. This talk will give a fascinating insight into the technical and commercial reasons for this.

Organised by Exploration and Production
Discussion Group
IP Contact: Sjoerd Schuyleman



'The influence of HMIP on combustion and investment decisions over the next five years'

Tuesday 26 September 1995,
17.00 for 17.30 - 19.00

Speaker: Dr David Slater,
Chief Executive & Chief Inspector,
HM Inspectorate of Pollution

Organised by Energy Economics Group
IP Contact: Jenny Sandrock



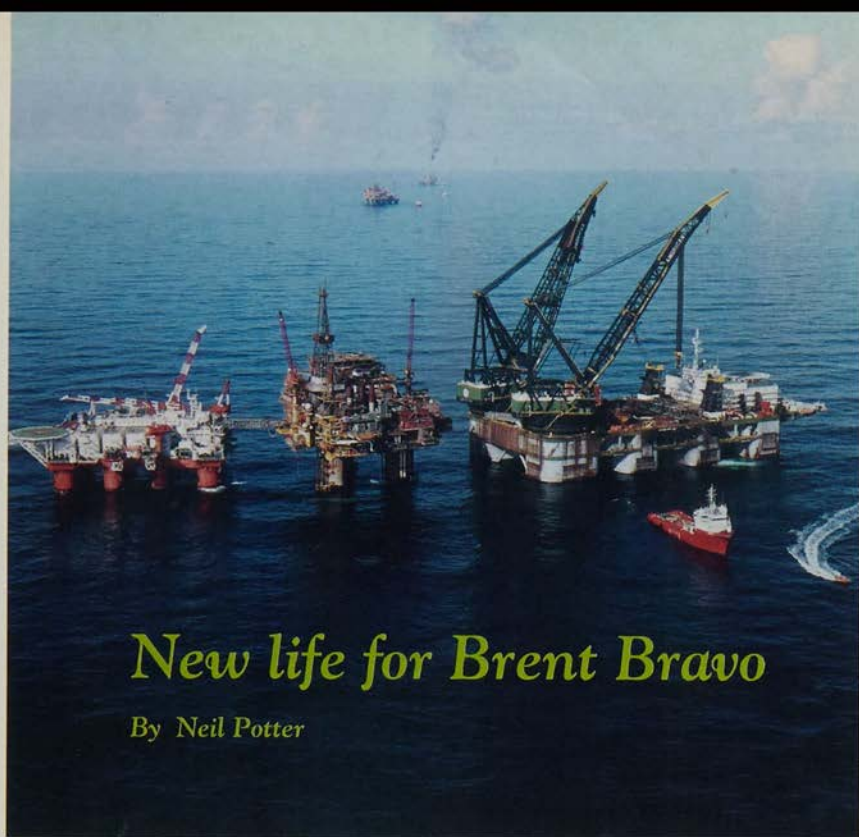
'Will residue upgrading economics dictate the trends in the European refining industry?'

Tuesday 3 October 1995,
17.00 for 17.30 - 19.00

Speaker: Dr Husain al Chalabi,
Consultant

Organised by Energy Economics Group
IP Contact: Jenny Sandrock

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New life for Brent Bravo

By Neil Potter

The 20-year old Shell/Esso Brent Bravo concrete gravity, drilling, production, quarters and storage platform is now back in production after a shutdown of 13 months for a £492 million refurbishment.

This marks the completion of the first stage of the £1.8 billion Brent field redevelopment plan – the largest brownfield engineering project ever undertaken in the history of the North Sea oil and gas industry. This is aimed at improving safety, reducing operating costs and turning the Brent oil and gas field into a predominantly gas producer by the end of the century. It will add at least 10 years to its life after 1998, when it had been forecast that production would cease.

Bravo production began at 8-10,000 barrels per day from three wells, as it was essential to start up gradually as the wells have been shut in. It will build up to 65-70,000 b/d. Initial associated gas production was 0.4 million cubic metres/day and was used for commissioning the new RB211 gas turbine driven compressors. Main gas production begins this month and will rise to 7-8 million cu m/d.

By 1990 when redevelopment came to be considered, Shell Expro had invested more than £4 billion

in developing the field, which had produced more than 1.3 billion barrels of oil and 42 Mcm of gas. Production in July was running at 185,000 b/d of oil from Alpha, Charlie and Delta from 60 producers and 30 water injectors. When the construction programme is completed in 1998, production will be 165,000 b/d. The British Gas 20-year contract, which expires in September 2002, is for 500 Mct/d and the new facilities will allow an increase in the contract level to 600 Mct/d.

Better recovery

It was originally estimated that only some 40 per cent of the oil and gas would be recovered. Now by the time the field is abandoned an estimated 55 per cent of the oil will have been recovered and 80 per cent of its gas.

The challenge was to find an economic means to produce this gas. The key to Brent's new life lay in depressurisation, which had never before been attempted on the required scale.

The pressure in the reservoir will eventually be lowered to release considerable quantities of oil and gas. The extra production will be the equivalent of a small oilfield (34 million barrels) and a medium-sized gas field (1.5 Tcf). The ultimate recoverable reserves will be 1,976 million barrels of oil; 157 Bcm

of gas and 620 million barrels of natural gas liquids.

If Brent had continued to rely on waterflood, it would have come to the end of its economic life for oil production around 1998. Because of its high GOR – 57 cu m per barrel of oil – a different solution presented itself, depressurisation of the reservoir. The reservoir pressure is at 380 bar and, starting in 1997, when Bravo and Charlie have been converted to low pressure facilities, water injection will cease and the pressures will be reduced gradually to 70 bar by the year 2010.

The second stage – deep depressurisation – will start early next century. Oil production from the gaslifted wells will decline. The key to achieving the necessary pressure depletion rate is controlling the flow of water from the underlying aquifer. Wells previously used for injection will be reversed, with aquifer water being drawn through them, boosted by submersible pumps.

But none of this could be achieved without fundamental changes to the platforms, which will have operating pressure reduced from the current 130 bar to 37.5 bar.

Ageing platforms

There are four platforms which lie in a line from north to south. The most southerly is the steel Alpha (19 years old). Beyond it are the concrete Bravo (20 years), Charlie (17 years) and Delta (19 years). They were designed to last for 20 years and their ageing facilities had led to problems. In fact, they were facing a midlife crisis.

The problems were: facility integrity; poor reliability/production losses; increasing manning requirements and growth in operating costs.

The prizes were: increased oil and gas recovery; extended field life and lower manning/operating costs.

Alpha will be upgraded but not converted to low pressure operation. Sometime in the next century production will no longer be viable and it will cease operation as a production platform.

Only three of the four platforms – Bravo, Charlie and Delta – needed to be redeveloped. It was determined that the most efficient manner would be to do this one at a time in order to maintain gas delivery contracts.

But time was short; topsides facilities would have to be in place on at least two of the platforms before depressurisation began in 1997.

Bravo refurbishment

Bravo was selected to be the first platform to be redeveloped. But the facilities were ageing and it was necessary to meet the new mandatory safety requirements post-

Cullen. Deficiencies which showed up included corrosion in the HVAC system, produced water system and fire protection with wear and tear and high maintenance costs; obsolete equipment in control system. The drilling system was ageing as were the cranes.

The major engineering design work has been carried out by AMEC Process and Energy under the Brent Engineering Contract. Implementation of the modification work offshore will be led by AOC International (Alpha/Bravo) and Wood Group Engineering Contractors (Charlie/Delta).

The work for the platform was divided into four phases – design, onshore construction, offshore pre-shutdown construction and offshore shutdown construction. Each phase required a separate safety case to be approved by the HSE.

A considerable amount of pre-shutdown work had to be carried out before the offshore work on Bravo could begin. In fact, design and procurement started in late 1991. Then offshore preparatory work by AOC began in the summer of 1993, while Bravo was still producing.

Each of the four platforms has three processing trains with four oil and gas separators. Under the new scheme, Bravo, Charlie and Delta will have only one processing train with two separators.

On 1 July 1994 the platform was shutdown. First the old equipment had to be removed. This included the obsolete compression modules, pig launcher, pigging module, gas injection module, cooling water package, gas conditioning module, flare boom, east crane and pedestal, the permanent living quarters, and in total this involved some 4,700 tonnes.

Brent Bravo:
The new gas processing module being lifted into place.



Bergen was chosen as a transshipment port for the old and new modules. For example, the original, 1,083 tonne compression module U43 was lifted off by Heeremac's heavy lift barge DB102 and taken there and was transhipped back to Teesside. The new, 28m x 16m x 164.5m high processing module was picked up and lifted into Bravo. This contains oil and gas separation and gas compression and treatment equipment.

The DB102 has certainly been an asset to the programme. It has been utilised for all heavy lifts, carrying out 34 in all, 19 taking off equipment and 15 installing. The two main big installation lifts were the new 3,200 tonne processing module, fabricated by SLP Engineering, which was installed at the southern end, and the 2,000 tonne 68-bed replacement permanent living quarters, built by Consafe at its Burntisland yard in Fife.

Together with the platform's existing quarters, there will be accommodation for a crew of 140.

Identical structures

Since the replacement modules for all three platforms would incorporate identical new features, it was decided to award fabrication contracts for each type to a single contractor. Thus Consafe is now completing the Charlie quarters, to be lifted on by the DB102 next year. In April it was awarded the £15 million contract for the design and construction of the 1,800 tonne, two person cabin module to be placed on Delta. Delivery is scheduled for October 1996.

Similarly, SLP Engineering completed the new processing module for Charlie in August. It will then start on that for Delta, due for completion in September 1996 and sailaway in May 1997.

Before the new modules could be lifted onto the platform, the deck had to be considerably strengthened and

new beams welded on to allow for the overhang for the processing module. At one time there were some 118 welders working on the platform.

One of the first tasks was to install a new floatel landing platform on the west side for Rasmussen's *Polyconfidence*. This floatel had been taken on a four-year contract starting in January 1994 and has provided some 900 beds for the workforce.

Gas production from Delta and Charlie passes over Bravo en route to Alpha

and the FLAGS export pipeline to St Fergus. So temporary crossover piping and gas pig traps were fitted at the southwest corner.

In the utilities shaft a new firewater pump was installed as well as head tank valves and instrumentation.

The old cantilevered flare boom on the south side was removed and replaced by a gigantic vertical flare tower located on the top of the replacement processing module.

The drilling facilities have been upgraded with topdrive being fitted and a new pipe handler installed.

A new crane has been installed on the east side. A new Honeywell TCD3000 system has been installed in the new control room.

Emphasis on safety

Much has been achieved in safety enhancement, apart from the more efficient topsides layout. The replacement quarters include the safe refuge, fire pump drivers and a diesel-driven emergency generator. A new lifeboat station has been created with three totally enclosed boats which can hold all the crew with access direct from the safe haven in the accommodation module.

The HVAC system has been substantially refurbished and, in part, replaced. Fire and gas detection and control systems have been refurbished and upgraded. Higher grades of corrosion resistant pipework has been specified in the deluge systems while higher capacity deluge water pumping facilities have been installed.

A dedicated Red Alert control room has been set up for the OIM in case of emergencies. The cladding around the wellhead deck has been removed and new skidbases hatches designed for explosion venting have been installed above the wellheads.

A new platform co-ordination room has been created which, during the project, has been issuing hundreds of work permits a day.

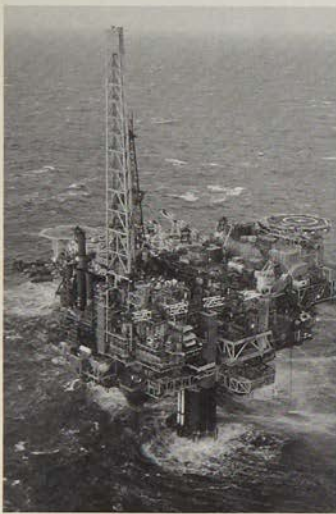
The redevelopment has brought the key safety benefit of reducing offshore manning. Crews will be cut back from around 280 to 140 as a result of the installation of more modern process control systems and lower maintenance requirements of new equipment.

The scale of the work on Bravo can be gauged by the fact that it involved around 2.7 million man-hours offshore. Other statistics include 240 miles of cable, 7,000 tonnes of steel, 1,650 helicopter and 280 supply boat movements and around 19,700 meals a week on the *Polyconfidence*.

Work continues

Preparations are under way for the shutdown of Charlie, where redevelopment costs are estimated at £422 million of which some 41 percent had been spent by June. The work is scheduled to be completed by the end of 1996. On Delta costs are put at £420 million and 11 percent had been spent by June, with completion by the end of 1997.

Overall the field redevelopment will involve some 9 million manhours of offshore activity at a cost of £75 per man hour. To put the total costs in perspective Dick Parker, Shell Expro Production Director, points out that for the same money five new fields the size of Nelson could be developed.



Guidelines for 'Routine' and 'Non-Routine' Subsea operations from floating vessels

This Guideline document has been prepared as a guide to safe practice for those concerned with drilling, completion or workover operations from floating vessels. It provides information and guidance on those issues which affect the structural strength and integrity of the subsea system; issues which primarily affect operability are not addressed directly. In this context, the subsea system includes:

- risers
- subsea blowout preventers (BOPs), including flanges (for drilling operations)
- subsea xmas trees, including flanges (for completion/workover operations)
- hydraulic wellhead connectors
- subsea wellhead systems
- subsea conductors (ie those located below subsea wellheads)

All of these items are primary structural components; the integrity of the system is dependent upon their suitability for a particular application. This Guideline has been produced in a United Kingdom Continental Shelf (UKCS) context, but the principles and recommendations have general relevance to similar operations elsewhere in the world. It is intended that this Guideline should be considered as a starting point, and general reference source for subsea operations.

ISBN 0 85293 156 5 Price £60.00 (Overseas £68.00)
25% discount to IP members

*This publication is available from The Library, The Institute of Petroleum,
61 New Cavendish Street, London W1M 8AR*

IP Annual Dinner 1996

The Institute of Petroleum's Annual Dinner in 1996 will be held at Grosvenor House, Park Lane, London W1 on
Wednesday 21 February.

The ticket application form will appear as a page of *Petroleum Review* in the October 1995 edition.

However, because of possible postal delays, non UK/European members who wish to apply for tickets should contact **Caroline Little** at the IP at
61 New Cavendish Street, London W1M 8AR
as soon as possible, and an application form will be forwarded during late September.

The closing date for receipt of ticket applications will be Friday 20 October 1995.

Tel: 0171 467 7100
Fax: 0171 255 1472



Having announced recently a restructuring of its UK retail network, Conoco is concentrating its future expansion plans on mainland Europe. At the present time attention is focused on southwestern Europe, where, confident of a growing market for petroleum products, Continental Oil SA is entering the Spanish market for the first time.

It has joined forces with the Italian refining company, Saras, and built a new distribution terminal at the port of Gijón on the northern coast of Spain. The new terminal was opened on 7 July when the ribbon-cutting ceremony was performed by Valentin Alvarez Areses, Mayor of Gijón, in the presence of other local dignitaries and representatives from Conoco, Saras and other companies involved in the project.

The £17 million terminal will import products from refineries in northwest Europe, including Conoco's own Humber refinery in the United Kingdom, for distribution to the expanding network of its Jet service stations in Spain. While these at present total 10 and are within easy reach of the terminal, a further 15 will open by the end of the year and expansion further afield is planned.

'Gijón terminal will be the hub of Jet's marketing expansion in northern Spain where we aim to develop a chain of 100 service stations by the end of the decade,' said Rafael Sanchez, Director, Continental Oil. 'Of these, half will be built or pur-

chased by Continental Oil and the rest will be owned by third parties but branded Jet,' he added.

The terminal can handle ships of up to 30,000 tonnes and has 12 storage tanks, capable of holding a total of 56,000 cubic metres of petroleum products and 6,000 cubic metres of tetrahydrofuran (THF). Conoco's parent company, Dupont, manufacture this at its adjacent Tamón Valley plant. The THF will be piped to the terminal and exported to Dupont's plant in Dordrecht where it will be used in the manufacture of Lycra.

The terminal's facilities are state-of-the-art. Safety and environmental features include automatic, quick-release loading gantries, vapour recovery systems for the jetty and truck loading bays and oil interceptors in the groundwater drains.

Market research

Unusually, before the service stations were designed, the company canvassed the opinions of its customers, the Spanish motorists, who were asked via a market research survey what they wanted from a service station. The company then took these views into account when its service station layout and facilities were designed. The local motorists even influenced the choice of colours – a close look at the logo reveals that the colours are not identical with those, for instance, in the United Kingdom.

This policy of adapting to local culture which is carried out everywhere in Europe means that each Conoco subsidiary has a different Jet logo in varying colours, as well as using another logo, SECA. This contrasts with other companies which aim above all for standardisation across their European networks.

believing that this brings both greater brand awareness and lower costs.

Again to accommodate Spanish likes and dislikes, the Jet forecourts are staffed. Self-service is not popular nor usual, accounting for only around 13 percent of all outlets throughout the country.

Some of the new Jet service stations are 'green-field' sites – the first company-operated site at Lurcar in Asturias opened at the end of last year and has already been followed by nine others.

Expanding market

Conoco and its partner Saras, which each have a 50 percent share in Continental Oil, are the most recent entrants into the Spanish market, liberalised in 1993. They are following other international oil companies such as BP, Shell, Total, Agip, Mobil and Texaco which have already started up in Spain. Elf is also present – in partnership with Spanish company Cepsa – while the largest market share belongs to national oil company, Repsol.

One of the main attractions for the incoming marketers is the above-average throughputs achieved in Spain, largely as a result of historical restrictions on the opening of new sites during the years before liberalisation took place – outlets then had to be a certain distance apart. Even now, according to the latest figures from the European Petroleum Technical Cooperation (EPTC), there are 6,140 service stations with the second highest gasoline and diesel sales per site in Europe – after Luxembourg.

Observers believe that by the year 2000 service stations could total 7,000, representing an increase of 200-250 new sites per year. Eventually, the total could rise as high as 10,000, according to some estimates.

A recent report on marketing profitability trends in Europe by Edinburgh consultants Wood Mackenzie states that Spain benefits from both high average service station throughputs and high gross fuel margins, giving 'very high' net cash margins per site. This explains why more and more oil companies are keen to obtain a share of that market for themselves.

European strategy

Conoco is concentrating its attention on mainland Europe, having cut back/rationalised its UK network because of the poor return on assets. Three months ago, Jet announced that it was going to close or sell 230 outlets, mostly in the southwest of England. At the same time it would cease operating from three terminals at Aldermaston in Reading, Hallen in Bristol and Bramhall in Cheshire. The future aim was to concentrate on the remaining 800 outlets. 'Jet aims to more than replace lost volume through focusing on core marketing areas,' said Retailing Manager Tom Souls.

At the same time Conoco is expanding elsewhere in Europe. The company now has marketing operations in nearly every European country – excluding only Italy, the Netherlands and Portugal. Altogether it now has 2,400 service stations in 16 countries. The service stations in Belgium, France and Luxembourg are branded SECA, while in Switzerland Conoco has a joint venture with the OK Co-operative and in the other countries the company operates under the Jet brand name.

From a base in western Germany, where it has a quarter share in the Karlsruhe refinery, the company has already moved into the eastern part of the country where it now has over 40 Jet stations. Attention is also being focused on the Czech Republic, Poland and Hungary where new outlets are constantly being added to the network. In Poland Jet opened the first service station with attached fast-food restaurant, a McDonald's, providing a welcome innovation for local motorists.

In order to supply this growing central European network, Conoco has joined up with Shell and Agip in a consortium which has been negotiating to buy an interest in the two major refineries in the Czech Republic – Kralupy and Litvinov in northern Bohemia.

In July a master framework agreement which will give the consortium a 49 percent share in the two refineries was signed with Unipetrol, the Czech partner. The consortium partners will pay \$173 million for their share. The final agreement is expected to be signed in November. Originally there was a fourth partner, Total, which pulled out shortly before the deal was agreed. This substantial investment in Czech refining is intended to lead to the upgrading of these two plants and a reduced dependence on Russian crude supplies.

This deal, together with the opening of the Spanish terminal at Gijon, illustrates Conoco's determination to pursue opportunities for long-term growth in what it sees as developing markets.

Terminal at Gijon, Spain



Southampton: academics at the leading edge of oil research

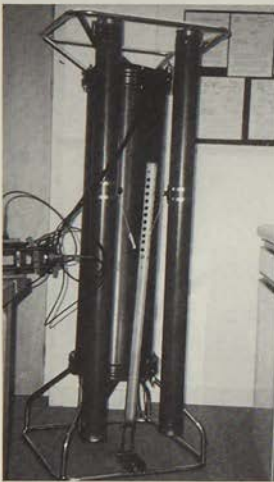
By Geoffrey Mayhew

The University of Southampton has been engaged in technical developments and research for the oil industry for 30 years. While one department – Mechanical Engineering – has been able to contribute well over £1 million in royalties to the university following the adoption of inventions, the results of on-going research into new areas in geology, geophysics, oceanography and electronics at Southampton are also available.

The degree of collaboration between the university and the oil industry is growing in many different ways. Exploration and production data are of increasing use in research, while the results of interpretation are fed back to companies.

Shell and Esso saw the need for a Professorship in Geophysics. Their offer to support the post for the first five years enabled the creation of this job, which is now funded by the university. As a result, the scope of research in geophysics has developed substantially, with many contracts lined up for future years.

High resolution spectrometer



'The success of Southampton is driven by the enthusiasm of the academics,' said Professor Martin Thew, Professor of Fluid Technology.

'In my view it is both wise and realistic to link with a body – a commercial one – which has financial resources in the development of a project. Mechanics and facilities have to be employed. As the public purse is used, it would be unethical to give away the product of one's work.'

'Collaboration with industry requires their confidence in your competence and, in the company, the existence of people who are receptive to the potential of new concepts – people who are willing to stand behind their judgement.'

'More people in industry

at large – and in the oil industry in particular – are now aware of the need for the work which is carried out by academics like us at Southampton. One aspect is that there are more universities and therefore more academics to pursue subjects but there is also a greater effort within companies worldwide to learn from the results of research. Everywhere people want to see better returns.'

Subsea choke valves

At present Mechanical Engineering, supported by the Engineering Materials Department, is preparing to take the lead academic role in a development that epitomises co-operation.

It has been chosen under the LINK programme – established by government to promote collaboration in research between industry and the universities – to improve the resistance to wear of subsea choke valves. This equipment controls the flow of hydrocarbons at or near the wellhead and the pressure drops across a valve are often large and can generate very high velocities. These can be damaging, particularly if the flow contains sand.

The potential annual savings, if the research can double – as is hoped – the life of the choke valve, amount to £15 million, given the number of subsea valves in the North Sea is expected to rise from 300 to 600 in 10 years, that their present normal life is only three years and the unscheduled replacement of one can cost £300,000.

The researchers at Southampton will develop a suite of tribology tests. These will include erosion, abrasion, adhesion wear and friction in order to provide coating performance information to the coaters to achieve economic manufacture. The university will work with two other universities, Oxford and South Bank, which have other areas to cover in the three-year programme. Industry support will come from BP, Asea Brown Boveri, SCORE, Park Cross Engineering and Archer Technicoat. BP will co-ordinate the programme.

Professor Thew estimates that the first of the longer-life valves will be installed within five years. The total resource cost is £700,000, of which Southampton's part is £150,000.

New techniques for diamond coating carbide and in the coating of steel at low temperature are also likely to be developed in the project.

Other successes

Other successful research has come from the department's Physical Separation and Multiphase Research Group. Responsible for the main thrust of the department's work since the late 1970s, the group has been developing compact and robust liquid/liquid separation hydrocyclones for the offshore indus-

try. It has been found recently that related process engineering problems such as fluid-borne particle erosion are of interest to a wide range of quite different industries, including food, process and nuclear.

This group's work in the first effective hydrocyclone for the removal of contaminate oil from water also led to numerous patents, from which the university received £1.3 million in 1985 - 94. In 1992 came the Prince of Wales Award for Innovation following the Norsk Hydro Award for water quality enhancement in 1991. This year the Queen's Award for Environmental Achievement was given to Vortoil for the separator developed through Southampton's research. It is now used on 150 production platforms for the cleaning of some 10 million barrels of water daily.

Stresses in pipe walls arising from cryogenic pipe freezing and degassing fuel in petrol pumps are among the group's current studies.

At the Optoelectronics Research Centre the group headed by Dr John Dakin is actively involved with a number of oceanographic sensors which monitor the optical properties of sea water. These have been built with funding support from the Institute of Oceanographic Sciences, NERC Swindon and the European Union. The most sophisticated sensor is a high-resolution spectrometer which measures the transmission and scattering of light in the ocean. The intention of this four feet high cylinder is to provide calibration for orbiting satellite monitors from actual in-water measurements. This would enable the satellite to examine large tracts of ocean, knowing it is 'seeing' the correct data. The instrument could also be used to detect changes in the optical properties of sea water that might arise from the direct or indirect effect of pollution. Trials are expected this year with the sensor, which was researched in liaison with the Oceanographic Department.

Oil spills

New ideas for the remote detection of oil spills on water - quickly - is a subject in which the Oceanography Department is considerably involved. Dr Simon Boxall described the trials which are taking place for a development likely to be of world-wide application - the use of standard shipborne radar as a tool in clean-up for the first time.

Arising from the department's studies of wave methodology, Dr Boxall tested what might be shown on a ship's normal radar screen if its beam was concentrated upon the surface of the sea. Would it be able to pick up oil on the surface with any accuracy? The answer is affirmative.

A unit is available which can easily convert the ship's radar for a detailed examination of water surface. If the further trials bear out the initial success in displaying reflections which indicate the presence of contamination in the form of changes on the screen, then papers will be published and Dr Boxall believes that owners of many types of vessels will install the unit so that masters can give reports which will assist the response if an emergency happens in their vicinity.

In the Geology Department, traditional links with the oil industry are well-established. The recent creation of the Geomechanics Research Group has brought together technologies and expertise in geology and civil engineering to tackle innovative problems in natural resource development, particularly in



hydrocarbon production and exploration.

It has received 24 financed research contracts from oil companies and national and international bodies since 1991, including a number from Research Councils. Recently it was recognised by the CEC as a centre to receive postdoctoral researchers in the study of fracture and fluid flow in the continental and oceanic crust. Techniques for very high resolution seismic reflection profiling are currently being developed. Work is also under way to find new methods of processing offshore seismic data in regions where the complex near-surface structure can cause problems in imaging deep oil reservoirs.

'The information we receive from oil companies, sometimes confidential, is a great help,' said Professor David J Sanderson, Professor of Geophysics. 'Companies do not have enough time to research it further themselves, but they recognise its value to us. There is no other way we could obtain it, and for our part we help the industry as a whole in writing papers on our progress, for which the question of a charge does not arise.'

The Determination of Thermal Maturity in Rocks, a study being carried out by Dr John Marshal, is a case in point. Organic materials alter during burial as temperature increases. In the measurement of changes to determine thermal maturity and the timing of oil generation, spore colour has traditionally been measured by eye. However, Southampton has shown how to measure it with a microspectrophotometer. This innovation has recently been applied successfully in exploration projects in North Africa and the Middle East.

There are, of course, many other studies going on within the university, often with the aid of graduates and postgraduates who are assisted financially by the industry. The academics there see new developments in science and technology emerging from co-operation between industry, government funding agencies and the university.

**Controlling
liquid flow in
pipes by
freezing**

Barrier creams – friend or foe?

By Ms L Morgan, Chair, IP Occupational Hygiene Subcommittee

Protection of the skin is vitally important for all oil industry employees, and some, but not all, types of skin creams have a role to play in petroleum workers skin care programmes. However, the current role and importance of barrier creams in particular is unclear and some would say in dispute! The majority of health professionals in industry are in agreement that the name itself is a misnomer, and that they should really be referred to as 'pre-work creams'. However, for the purposes of this brief article, I will use the term 'barrier cream' (BC), to avoid any confusion. BCs have been in use in engineering, manufacturing and the petro-chemical industries for over 50 years. Indeed, in one major petroleum company in the 1960s, it was a mandatory requirement for maintenance and plant workers to apply these creams daily.

There are many types of BCs available but no universal one. The main ones utilised are those advertised as protecting against oil, grease, solvents, chemicals, dusts and resins – an incorrect selection of a BC could mean that it is ineffective. BCs have been described by the manufacturers' literature in various ways such as:

- liquid gloves
- spray-on skin
- second skin
- skin protector
- skin barrier.

The findings from toxicological testing have been variable and not always favourable.

For example, they are unlikely to be effective against skin sensitisers such as nickel and chromates. In fact, it is commonly known that skin problems have occurred through the use of some BCs. These have been three-fold, in that some people's skin has become allergic or sensitive to the BCs themselves, whilst other problems have been due to the BCs reacting with the materials/chemicals being handled, and finally the most common ones being due to the poor application or misuse of the BCs.

The main conclusion is that BCs are not a substitute for adequate engineering design and control procedures or gloves, and wherever possible, gloves rather than BCs should be used. Many health professionals and specialist dermatologists feel that there is no place for BCs in solving/dealing with petroleum skin care problems and that with the introduction of appropriate engineering controls, gloves and good personal hygiene programmes, BCs have been removed from use. Others advocate that BCs should be worn under gloves, as it

has been acknowledged that they make the hands easier to clean and so reduce the need for more abrasive cleaners. However, this can present further problems as BCs often leave a greasy film on the hands which may contaminate the workpieces, the interior of protective gloves or interfere dangerously with hand grip.

The BCs have not only to be applied correctly but also fully removed at the end of the workshift. Moisturising creams should then be used to replenish the skin's natural oils.

The Health and Safety Executive (HSE) in two recent publications has supported the view that BCs are of limited value. In its guidance document *'Health Surveillance Programmes for Employees Exposed to Metalworking Fluids'* (1), it is pointed out that: 'Some pre-work (so-called barrier) creams may assist rather than prevent skin penetration of the fluid/solvents.'

In the accompanying information sheet *'Skin Creams and Skin Protection in the Engineering Sector'* (2), it states that BCs are not 'liquid gloves', or that they will not provide the same level of protection as the appropriate glove and that BCs should not be used if a glove will do the job. The four main disadvantages of using BCs are listed as:

- 1) It is not possible to ensure that all areas of the hand/forearm are sufficiently covered by the BC.
- 2) It is not possible to obtain penetration and degradation data on BCs to aid selection of the correct type.
- 3) The wear and tear of the applied BC cannot be easily or routinely checked.
- 4) They wear off during the course of the day.

Additionally the use of BCs can give a false sense of security.

The Information Sheet continues with a hierarchy of control for skin protection. They emphasise that BCs should not be relied upon as the primary protection for the skin.

They do acknowledge that the use of BCs does make workers more aware of the need for appropriate skin-care programmes and that, as previously mentioned, they can aid with skin softening, cleaning and washing procedures.

The IP recommendations, therefore, are:

- BCs have at best a limited place in skin protection programmes
- BCs should only be used when alternative control measures are inappropriate
- Their limitations should be recognised and should be fully explained to all BC users.

To aid such training, a small poster (free) is available from the IP. This is shown in the accompanying box.

References

- (1) *'Health Surveillance Programmes for Employees Exposed to Metalworking Fluids'* guidance for responsible person. Printed and published by the HSE IND (G)165 (L) 2/94 C300.
- (2) *'Skin Creams and Skin Protection in the Engineering Sector'*. Information sheet, Engineering Sheet No 14 NIS/10/94, printed and published by the HSE.

HAND PROTECTION

Do avoid skin contact with chemicals, oils and solvents wherever possible.

Do use suitable engineering/procedural control measures or gloves to prevent skin exposure.

Do ensure that, if barrier creams are used, the correct ones are selected for use – eg water-resistant creams for aqueous work only – and they are correctly applied to all exposed areas of the fingers, hands and wrists.

Do replenish the barrier creams regularly during the period of your work shift.

Do maintain a high standard of personal hygiene during working hours, washing your hands thoroughly and regularly, applying a moisturising cream after each washing.

Do use appropriate skin cleaners. At the end of the work shift ensure that the barrier cream is fully cleansed from the hands and that a moisturising cream is applied.

Do use the minimum amount of hand cleaner to clean the skin, avoid harsh cleaners.

Do seek advice from your supervisor or occupational health department if you are uncertain about which type of cream or gloves to use, or if you are unsure about any aspect of your hand protection/skin care programmes.

Do not rely on barrier or pre-work creams as the only means of hand protection.

Do not use workplace solvents for cleaning your hands.

BP Statistical Review of World Energy 1995

(Available from BP Educational Service, PO Box 934, Poole, Dorset BH17 7BR) 36 pages. Price £10 with discounts for bulk orders. Also available on diskette.

An invaluable source of statistical material on all sectors of the energy industries worldwide. Figures for reserves, production, consumption, trade movements and prices cover the whole industry. Produced annually, each edition incorporates new terminology, the availability of better information and any political changes occurring during the previous 12 months.

FT Guide to North Sea Operators

Meg Leitch (Financial Times Energy Publishing, Maple House, 149 Tottenham Court Road, London W1P 9LL) 295 pages. Price: £295 (UK and overseas) ISBN 1 85334 274 2

The sixth edition of this comprehensive company-by-company review by the editor of North Sea Letter, it covers all operator companies on the Northwest European Continental Shelf including all fields in production, under development or at the appraisal stage. Countries covered include the United Kingdom, Norway, Netherlands, Denmark, Ireland and Germany.

The Spratly Islands Archipelago - Its Influence on Regional Stability in the South China Sea

(Blanche Oil and Gas Consultants, Tara, Laighill Place, Dunblane, Perthshire FK15 0BJ)

A report giving the giving the background to the various claims to these islands in the South China Sea and currently in the news. It discusses the possibility of the development of their natural resources, including hydrocarbons.

The Shell Bitumen Industrial Handbook

(Shell Bitumen, Riversdell House, Guildford Street, Chertsey, Surrey KT16 9AU) ISBN 0 95 16625 1 1

This very detailed book attempts to pull together in one volume the uses of bitumen in non-roads applications.

Lubricants Europe The directory of lubricant and lubricant additive suppliers in Europe.

Second edition. 328 pages. Paperback. (Leaf Coppin Publishing Ltd, PO Box 111, Deal CT14 6SX, England) ISBN 09513426 7 3. Price: £175/\$320 plus overseas postage of £20/\$35.

A new and completely revised second edition of this directory, which gives details of lubricant and lubricant additive companies and their products in 34 countries in Europe. The first section lists companies by country; the second section gives product details by company.

The International Review for Chief Executive Officers

Three volumes. Volume 1: *Confederation of Independent States. Volume II: Eastern and Central Europe and European Russia. Volume III: Siberia and Far East* (Sterling Publications, PO Box 799, Brunel House, 57 North Wharf Road, London W2 1XR) ISSN 0969 143X.

A detailed survey of all industries.

Doing Business in South Africa

Consultant Editor: J Reuviv. Second edition (Published by Kogan Page, 120 Pentonville Road, London N1 9JN)

ISBN 0 7494 1347 6. Price: £35 (paperback).

A guide which highlights business opportunities in a market of 40 million consumers and can be used as a launchpad to reach the 124 million people in the African continent. This book provides invaluable and detailed practical information.

Applied Mathematics and Modeling for Chemical Engineers

Richard G Rice and Duong D Do (John Wiley & Sons Inc., Baffins Lane, Chichester, West Sussex, PO19 1UD, England). ISBN 0471 111562 Price: £22.95 (paperback).

A textbook in paperback designed for students. The purpose of this book is to attempt to bridge the gap between classical analysis and modern applications.

Managing Energy Price Risk

(Published by Risk magazine in association with Enron Capital and Trade Resources. 104 -112 Marylebone Lane, London W1M 5FU) ISBN 899332 10 3 (paperback). Price: £139/£89

A comprehensive review of over-the-counter energy risk management. Each section is written by experienced and leading analysts in this field.

Industrial Water Treatment

F Berné and J Cordonnier (Published by Editions Technip, 27 rue Ginoux, 75737 Paris, CEDEX 15 France) ISBN 2-7108-0673-8. Price: FF340.

This book aims to introduce waste water and cooling water treatments to student and graduate engineers in the oil and chemical industries. It is based on industrial implementation of these treatments and describes operators' experiences in running their own facilities in a number of plants.

The Hedging Efficiency of Crude Oil Markets

Paul Horsnell, Alban Brindle and Walter Greaves (Published by the Oxford Institute for Energy Studies, 37 Woodstock Road, Oxford OX2 6FA) ISBN 0 948061 86 3.

This paper considers the measurement of hedging efficiency, looking at conventional measures and proposing as an alternative the use of simulations of hedges.

Automotive Fuels Reference Book

Keith Owen and Trevor Coley (Published by the Society of Automotive Engineers. Available from American Technical Publishers Ltd, 27-29 Knowl Piece, Wilbury Way, Hitchin, Herts. SG4 0SX, UK) 976 pages. Price: £111.00 ISBN 1-56091-589-7

This book updates the first edition published in 1990 as the Automotive Fuels Handbook. Written from a global viewpoint, it covers subsequent changes in fuels technology and fuel quality. Also included is information on the health and environmental effects of fuels and alternative fuels, LPG, LNG and CNG.

Workers in an Integrating World - 1995 World Development Report

(Published for the World Bank by Oxford University Press). ISBN 0-19-521102-2

This report focuses on the incomes workers receive, the risks they face and the conditions under which they work.

Operational envelopes for subsea drilling equipment and operations

The Institute of Petroleum has just published "Guidelines for 'Routine' and 'Non-Routine' Subsea Operations from Floating Vessels." This article describes how the document came about and how it will be used.

Background

In 1990 the UK Department of Energy issued a discussion document to all sectors of the offshore industry including the Institute of Petroleum. The document sought to highlight the department's concerns as to the fitness for purpose of the critical pressure containing and structural components of the subsea drilling equipment. Of particular concern was the subsea wellhead connector, the hydraulic clamp which secures the blow out preventers to the sea bed housing on top of the well. The broad theme of the document was that the department wished to be assured that all subsea equipment would retain its integrity under the combination of environmental and pressure loading which would be applied.

Three other key constituencies involved in North Sea drilling operations received this discussion document – the UKOOA Drilling Practices Committee (DPC); the International Association of Drilling Contractors UK Chapter (IADC); and the Association of Wellhead Equipment Manufacturers (AWHEM).

All these groups recognised that the issues identified in the discussion document would need to be addressed by the entire industry, so, at the instigation of the IP upstream staff, a task group was formed to prepare a collective industry response. The task group comprised two principal engineers, recognised for their subject knowledge, nominated by the IP to co-chair the group, and two representatives from each of the three constituency groups.

The IP Task Group

Very quickly the task group realised they had two distinct issues to address. The search for oil at greater depths, in deeper waters, at higher pressures and from newer rigs was undoubtedly challenging the capacities of the existing equipment. However, there was very little evidence to suggest that for the majority of offshore drilling operations, the subsea equipment was being loaded to a level which could cause failure. The group therefore decided to classify offshore drilling operations as being 'routine' or 'non-routine' and to address each case separately.

'Routine' drilling operations

The group decided the best way forward for the industry was to confirm the observation that most

current equipment was satisfactory for routine operations through a comprehensive series of analyses. With significant funding from the IP, supplemented by the HSE which had taken over the former Department of Energy responsibility for offshore safety, the Task Group awarded a contract to W S Atkins.

W S Atkins compiled data on all subsea equipment and rig types in use in the North Sea and constructed a set of generic Finite Element (FE) models corresponding to a routine drilling operation (Figure 1). For each component an operational limit was derived from either standard industry references or from a recommendation from the Task Group. The loading on each component was then derived from the FE model to determine the combination of wave height and applied drilling riser tension which would exceed the operational limit. The operational limits for all the components for the generic system in a given water depth were then plotted on a single graph (Figure 2).

When the operational limits of all the components had been plotted, it was possible to identify an upper-bounded region where there was no combination of wave height and riser tension which would exceed the limits on any component: the 'operating envelope'. Two sets of operating

Typical Drilling System Layout for 'Routine' Case

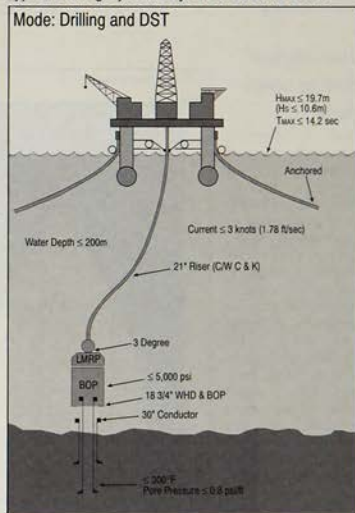
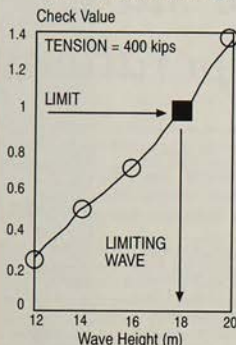
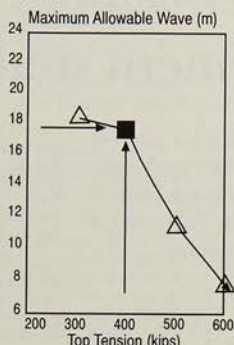


Figure 1

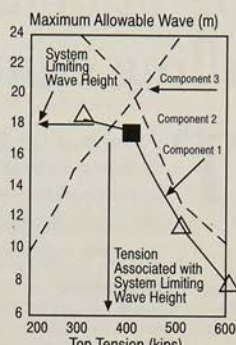
Methodology for deriving opening envelopes



Stage 1
Derive component specific limiting wave height for a given tension and water depth for component 1



Stage 2
Plot calculated limit, and repeat stage 1 for additional tensions at the given water depth for component 1



Stage 3
Repeat exercise for other components and plot results

envelopes were developed for each water depth: a 0 psi internal pressure case; and a 5,000 psi shut-in pressure case. The additional pressure loading considerably reduces the capacity of the drilling system to accept environmental loads and thus results in a smaller operating envelope (Figure 3). These results confirmed the empirical observations of the Task Group – relatively few drilling operations would have combined high internal pressure and environmental loading.

tions, the Task Group set out a procedure for their analysis. The procedure covers every aspect of the work necessary to develop a specific set of operating envelopes for a unique equipment configuration or operation (Figure 4).

Figure 2

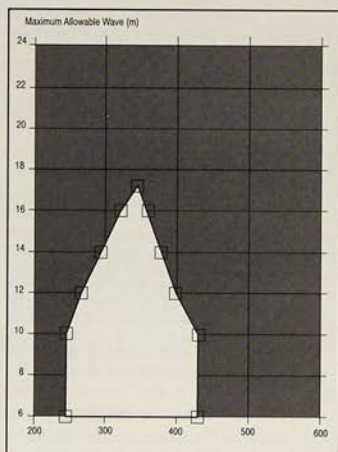
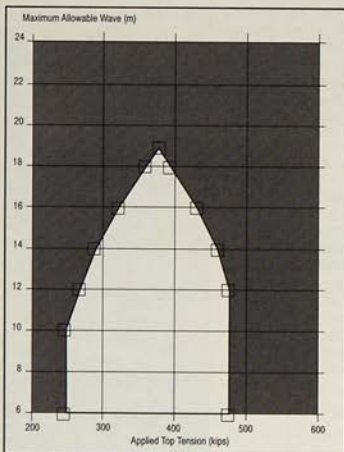
How the IP guidelines will be used

'User friendly or it doesn't get used' was the Task Group's principle. The guidelines therefore contain such features as a simple check-list for establishing whether a given situation is 'routine' or 'non-routine'.

Figure 3

'Non-routine' drilling operations

The generic approach, so well suited for the 'routine' case analysis, was inappropriate for the multitude of situations where the circumstances would be different: dynamically positioned rigs without mooring systems; very deep water drilling; high pressure drilling; long duration wells when fatigue would become a concern; unconventional wellheads; completion riser systems etc. To accommodate these situa-



Typical 'Non-Routine' Completion/Workover System Layout

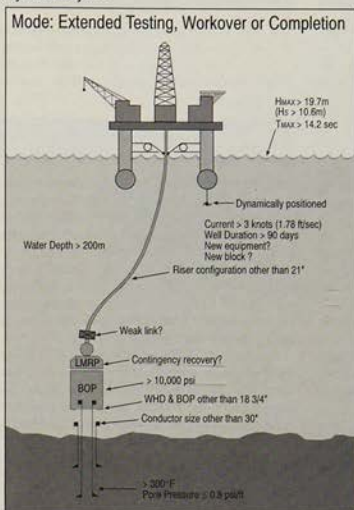


Figure 4

tine', data acquisition sheets, notes on the theories used and worked examples. The guidelines fit well with the current offshore safety regime where the onus is on the operators to demonstrate the performance of their systems. The operator can confirm through liaison with the equipment suppliers and drilling contractors that the proposed operation conforms to the 'routine' case. They can then use the operating envelopes defined in the guidelines as a basis for their offshore operations. If a 'non-routine' case analysis is required, there is a comprehensive procedure which can be used by the operator, independent analysis, drilling contractor or equipment supplier.

The IP role

In the development of the guidelines, the Institute played an important role in: bringing together the right people to address an issue which was common to all sectors of the industry; empowering a Task Group to develop a solution; providing the necessary funding and providing the administrative and publishing resources for ensuring the information would become part of the essential reference literature of the offshore industry.

Gregory King, Mobil, Aberdeen and
Co-chairman of IP Task Group

These Guidelines are available from the Library, The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR. Price: £60 (£68 overseas)

IP
THE INSTITUTE
OF PETROLEUM

Corporate Treasury Management for the Oil and Gas Industries



Price Waterhouse

A series of seminars focusing on the major corporate treasury issues of interest within the petroleum industries.

- 11 September 1995 – The role of corporate treasury.
- 9 October 1995 – Identification and reduction of financial risk.
- 13 November 1995 – Management information systems in the treasury environment.
- 11 December 1995 – Trading and the misuse of derivatives.

Speakers will be from Price Waterhouse and other experts in the industry.

All seminars will be from 17.00-19.00

Details from Jenny Sandrock at the IP Tel: 0171 467 7104 (direct line) Fax: 0171 255 1472 or Iain Fidler of Price Waterhouse Tel: 0171 939 3000 Fax: 0171 378 0647

TECHNICAL REPORT

Upstream

The IP was represented at the ISO/TC 67/AG 3 Planning and Liaison meeting in Calgary. This meeting was held in conjunction with the API Annual Conference and the IP delegate was funded, for the first time, from the BSI Staff Travel Fund. There is evidence of increasing co-operation between API and ISO to accelerate the development of the standards required by the petroleum and natural gas industries.

Guidelines for "Routine" and "Non-Routine" Subsea Operations from Floating Vessels has been published and will be launched in Aberdeen in early September at the Offshore Europe Conference and Exhibition where the IP will have a stand.

At the request of the HSE, a presentation and workshop on this same subject was held on 15 June in Aberdeen for their senior technical staff and offshore inspectors. The presentations were well received as a thorough and useful study which more than met the initial concerns which triggered the research.

The HSE-funded 'Shock Tube' experiment is due to be completed shortly. AEA Technology has submitted a revised proposal to carry out a theoretical study of tube and shell heat exchangers, which will also report the results of work they have performed for the nuclear industry. Their proposal is currently being evaluated by the Task Group.

Refining & Marketing

Comments have been submitted on HSE's consultation draft of the safety risk assessment process for service stations - part of HSG41 Replacement. This assessment will be used in selection of equipment and facilities.

A listing of joint industry comments and concerns on NRA's pollution prevention guidance PPG 18 has been prepared on behalf of CBI.

IP representation has been secured on the project steering group preparing standards for pollution prevention facilities on behalf of NRA and DOE. Specific oil industry comments on drafts are being submitted.

Aviation Committee has identified the need for increased research effort next year into fuel filter issues as the IP's contribution to the joint development with API of new standards.

A working group has been established to develop extended advice for area classification in LPG operations and to determine whether there is a need to replace the current calculation method for identifying zone boundaries.

Publication of the bottom loading/vapour recovery/overflow protection code is held up pending agreement with equipment suppliers on additional advice to be given on pressure drop design of vapour collection systems on road tank vehicles.

Guidelines for the Identification and Control of Hazards during the Proving of Road Loading Vehicles has been published.

Revision of the IP Product Identification System has been concluded. It will be published after colour-printing arrangements have been finalised.

Following notification by HSE of their concerns about fire and explosions resulting from pigging operations on pipelines containing flammable liquids, the IP has surveyed such operations in the UK oil industry. No incident has been reported. Pigging operations employing compressed gas are practised at only a minority of refineries and crude oil terminals, only one of which occasionally employs air. However, gas pigging is widespread at marketing terminals; air is used by several companies. A meeting with HSE and with ITSA, which also practises pigging with compressed air, will take place this month.

Measurement

The new *Guide to Hydrocarbon Loss Accounting and Control in Petroleum Refinery Operations* will be published shortly.

The Code of Practice for the Calibration of Retail Metering Pumps/Dispensers will be finalised for publication later this month.

Health

A successful workshop on the Health Aspects of Particulates was held at the Institute in June. This workshop was attended by national experts together with invited industry health professionals. The preparation of a summary of the discussions at the workshop is underway.

The research report on *The Health Effects of Particulate Air Pollution* has been completed and will be given to a selected number of influential health professionals. It is proposed to develop a technical paper from this work and publish it in an international peer review journal.

A paper on adduct formation and its use to indicate the carcinogenic potential of mineral oils has been developed from the 1995 IP research project on Bioavailability and published in the *Journal of Applied Toxicology*.

Guidance on the use of barrier creams has been developed (see page 426). A wallchart is available from the IP on request.

The Institute case control study of leukaemia and its possible association with benzene exposure amongst oil distribution workers is nearing completion and is expected to be published shortly.

Environment

Preparations are underway for the development of a guideline for an environmental risk assessment, covering emissions to ground and groundwater which will be proposed by the IP as part of the HSG41 replacement work.

A successful open workshop on the sampling and measurement of pollutants in the urban environment was held at the Institute in June. National oil monitoring networks were described as well as the problems of measurement of particulates.

Test Methods

A strong UK delegation attended the CEN/TC 19 meeting which has responsibility for which specifications and test methods on petroleum and related products. There was no support for a proposal to develop a Standard to determine microbiological contamination of middle distillates, as test method, IP 385, is widely used.

Representatives attended a meeting of the ISO/TC 28 Advisory Group (AG), which was held at the same location as the ASTM D02 meeting in Indianapolis, USA. The work programme was reviewed and new procedures for work discussed.

New and revised IP test methods have been balloted within the ST sub-committees for inclusion in the IP Test Methods Book. These include the revision of four methods and the introduction of four new full methods and three new proposed methods. In addition, up to 10 International Standards on petroleum test methods will be implemented and will be published as new or revised Parts of the BS 2000 Series.

A further eight International Standards have been adopted as European Standards and will be included. Four of these standards have already been implemented as Parts of the BS 2000 Series and are available for purchase from the IP Library.

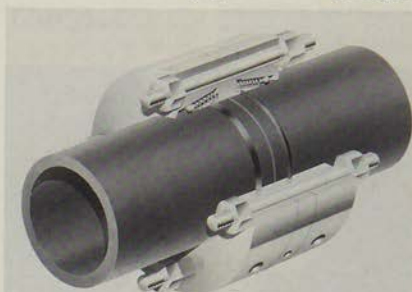
John Hayes, Technical Director

Going topside with new weldless pipeline couplings

Hydra-Tight Ltd have developed a range of new weldless mechanical pipeline couplings. Designed for topside applications, the 1000 and 2000, are based on the original MORGRIP's design but have been modified to remove features which are not required topside.

The company have devised new simplified designs which, they claim, can result in 60 percent reduced costs.

To achieve this the ball retraction components which control the protuberance of the ball bearings of the gripping mechanism have been removed, along with some other non-essential



The new 1000 weldless mechanical pipeline coupling elements from the modular make-up to 2500lb ANSI class (10,000psi), in sizes up to 36" diameter, and can be specified fire-safe if required.

The new couplings still provide pressure ratings of up

to 2500lb ANSI class (10,000psi), in sizes up to 36" diameter, and can be specified fire-safe if required.

Three new instrumentation ball valves

Parker Hannifin have launched three new families of instrumentation ball valves - constructed from exotic Monel, 6Mo and Hastelloy steels. The valves are said to be ideal for use in offshore and other harsh environments, and will be introduced with a full selection of tube sizes, and joining brass and 316 stainless steel products to provide a comprehensive range for process instrumentation designers.

The company will also extend the performance of its instrumentation ball valve range with a new product suitable for extremely high pressures of up to 10,000 PSIG, to use in hydraulically-actuated control systems like those found on well-heads.

They have also launched a new generation of double block and bleed manifolds, which, it is claimed, simplify and lower the costs of instrument connection in high-integrity and environmentally sensitive processes. The manifolds offer substantial reductions in space, weight and size and eliminate up to 20 potential leak paths compared with traditional assemblies.

CAA approved helicopter suits

Typhoon International has launched a brand new range of state-of-the-art helicopter passenger suits. The three OWP suits received CAA product approval in July this year, and have been approved to meet CAA Spec 8 fire retardancy requirements. All the suits are made

from Index B breathable FR fabric and have been designed to accommodate Air Pocket. The company has also introduced a helicopter crew suit which is ergonomically designed for mobility, comfort and practicality and meets the requirements of CAA Spec 19.



Helicopter passenger and crew suits

Integrated system for bulk storage management

Because of the cost involved in the storage of bulk product, many petroleum companies contract out or share storage facilities. Storage operations vary from company to company, but tend to work on the same principles. To aid third-party bulk storage and handling operators, Topas has introduced a new, stand-alone module to its family. The Bulk Storage and Handling Management System has been developed to meet the needs of bulk storage and handling operators throughout Europe.

Designed to manage all aspects of bulk stock movement control, the system comprises management, loss/gain accounting, customs administration and invoicing.

The module provides full multi-language facilities and can be easily adapted to meet differing company and country specific requirements and optional integration to process control systems such as TAS.AT and Weighbridge.

Tiny turbodrill on trial in North Sea

A new 3 3/8" SBS turbodrill has been designed and manufactured by Neyfor-Weir.

It can be used for coiled tubing drilling and short radius drilling, where it would produce similar technical advantages to the 4 3/4" SBS, which, the company claimed, has broken several world records drilling the horizontal sections of Shell Expro's gas wells in the southern North Sea.

The drill is currently on a rig offshore Holland where results of the first field trial are being eagerly awaited.

Pneumatically timed pumps and regulators

A new range of chemical injection and metering pumps and high purity liquid and gas pressure regulators is being introduced by Haskel Energy Systems Ltd of Sunderland. The chemical injection pumps are equipped with integral pneumatic timers to control cycling speeds of between 0-50 cpm. Pressures to 690 bar and injection rates of between 0.5-250 litres per day can be accommodated within the range.

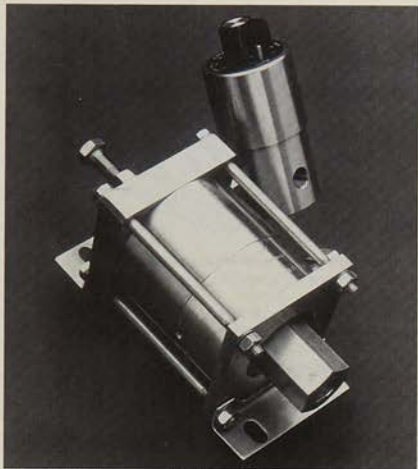
The new high purity liquid and gas pressure regulators are manufactured in 'clean room' conditions to ensure that there can be no contamination.

There is a choice of metal body options such as monel, titanium, stainless steel, brass, aluminium and hastelloy. Inlet pressures of between 10 and 700 bar and outlet pressures to 400 bar can be met within the range offered.

All the pumps are

compressed air or gas driven and require no electrics, thus making them

very safe for high risk areas commonly found in on and offshore locations.



Chemical injection pump with adjustable piston stroke timer

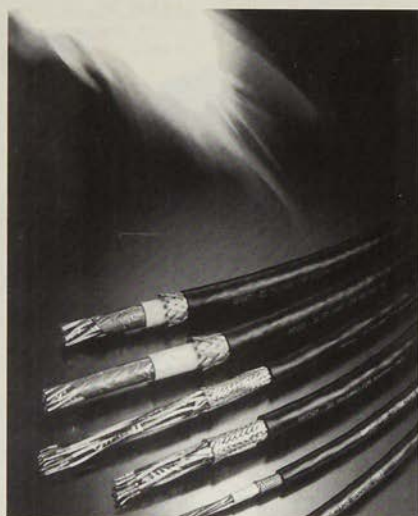
Small size multi-core cable for offshore use

The FR1000, a new lightweight, small size multi-core cable system for offshore and industrial markets has recently been launched by Raychem.

The cable consists of primary 95 wire with a Zerohal jacket and can be used throughout an offshore platform, simplifying the selection of cables for designers and electrical engineers.

The cable is fire resistant and flame retardant and has the same mechanical strength and resistance to hydrocarbons as other Zerohal cables.

With more than 460 km of cabling on a typical platform, there could be potential savings of up to 150 tonnes topside, which would have a significant input to the CRINE (Cost Reduction in the New Era) initiative while offering benefits above the conventional approach it is claimed.



FR1000 lightweight, small size multicore cable system

Individually designed radiant heat shields

Capex Durasteel has announced a breakthrough in the development of radiant heat shields.

Levels of radiant heat resistances are achieved by using different combinations of material. These include single skin Durasteel, single skin expanded metal mesh, double layer expanded metal mesh and Durasteel with expanded metal mesh.

The lightweight stainless steel frame has built-in drainage points and ready drilled fixing holes, for speedy installation. All shields have been tested at Warrington Fire Research Station using NAMAS calibrated instrumentation.

Each system is designed, manufactured and installed to meet precise needs. A brochure detailing the heat shields, includes useful performance graphs and radiation to pain threshold information, to simplify and ensure accurate selection.

Cast-iron explosion proof motors

The full range of explosion proof motors is now available from Tuscan. The WEG EExd motors comply with DIN EN50014, EN50018 and EN50019 standards. They are widely used in applications such as fans, exhausters, hoists, drillers and conveyors.

The range consists of 17 frame sizes from 90s to 355 M/L, in 2, 4, 6 and 8 pole configurations. Power outputs from the motors extend from 0.75 right up to 362kw, and speeds span the range up to 3600rpm. They are constructed from cast-iron frames and terminal boxes, ASTM 1045 carbon steel shafts, dimensioned grease lubricated ball bearings and high tensile fasteners. The frame which is IP55 rated, provides high mechanical resistance to withstand explosion impacts.

Large grant guarantees next phase of research project

Oilfield scale, insoluble salts which can accumulate and fur up oil wells in the same way that lime scale can fur up a kettle, is a major problem for oil companies. Build-up slows the oil flow from the wells which produce oil from undersea fields. If the clogging becomes serious the whole operation has to be shutdown to clear the pipe and pour in chemicals to slow down the build-up of further oilfield scale. This can cost the oil companies millions of pounds a year as well as inter-

fering with supply to the customer.

Sixteen North Sea oil production companies have joined together to fund a million pound third phase of research work on the problem at the Oilfield Scale Research Group at Heriot-Watt's Department of Petroleum Engineering.

The team is led by Technical Director Professor Ken Sorbie, who aims to take the hit-and-miss element out of current treatment methods.



Professor Ken Sorbie

New range of man-riding winches

Ingersoll-Rand will be launching new Third Generation™ Force 5 Series of man-rider air winches after issuing a warning to the offshore construction industry concerning the improper use of winches for lifting or lowering offshore personnel.

The winch carries full certification for offshore work. Designed for world-

wide markets, they incorporate CE marking and standards for supplies to the European Community and meet the North American ASME B30.7 – winch standards.

The FA5A-S and FA5A-L winches incorporate new standard features offering enhanced reliability, lower maintenance, enhanced control and superior performance.



Superior performance man-rider air winch

Multi-function hazardous area weighing systems

Avery Berkel has developed 'Loadstar Ex' – industry's first high performance instrumentation range with full DTI approvals for trade weighing in environments classified as hazardous.

The range comprises three new safe indicator systems which can be used with scale platforms or vessels in hazardous areas. Each model in the range offers differential levels of functionality and data

capture – from the L117Ex weigh-only digital indicator, to the L227Ex multi-purpose indicator with on-board software. This means that filling, batch weighing, check-weighing, counting, packing runs and product listings can now be carried in hazardous areas, improving manufacturing efficiency and traceability with full compliance to exacting trade weighing legislation.



'Loadstar Ex', the new multi-function indicator

CONTACTS

Hydra-Tight Ltd	01922 612521
Parker Hannifin plc	01271 22591
Typhoon International Ltd	0181 876 9818
Topas (UK) Ltd	01628 810999
The Weir Group plc	0141 637 7111
Haskel Energy Systems Ltd	0191 549 1212
Raychem Ltd	01793 528171
Cape Durasteel Ltd	01933 440055
Tuscan Motors	01384 459777
Heriot-Watt University	0131 451 3443
Avery Berkel	01922 434343
Ingersoll-Rand	0800 282040

FORTHCOMING EVENTS

September

4th

London: 'High Strength Steels in Offshore Engineering'. Details: Jim Grant, MTD, 19 Buckingham Street, London, WC2N 6EF. Tel: 0171 321 0674 Fax: 0171 930 4323

5th-8th

Aberdeen: 'Offshore Europe '95'. Details: Offshore Europe Partnership, Rowe House, 55/59 Fife Road, Kingston-upon-Thames, Surrey KT1 1TA. Tel: 0181 549 5831 Fax: 0181 541 5057/5016/547 2807 Telex: 8954102

6th-8th

Mexico: 'Coastal '95: Computer Modelling of Seas and Coastal Regions'. Details: Liz Johnstone, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton, SO40 7AA UK. Tel: 44 0 1703 293223 Fax: 44 0 1703 292853 EMail: CMI@uk.ac.rl.lib Intl EMail: CMI@ib.rl.ac.uk

7th

London: 'Venezuela Seminar'. Details: Petroleum Exploration Society of Great Britain. Tel: 0171 495 6800/5800 Fax: 0171 495 7808

10th-13th

Nice: '1995 AAPG International Meeting'. Details: AAPG International Conference, PO Box 979, Tulsa OK 74101-0979 USA. Tel: 1 918 584 2555 Fax: 1 918 584 2274

11th-13th

Cambridge: 'Oil and Gas Transportation Workshop'. Details: Langham Oil Conferences Ltd, 37 Main Street, Queniborough, Leicester LE7 3DB. Tel: 01509 881022 Fax: 01509 881576

11th-13th

Aberdeen: 'Loss Prevention in the Oil and Gas Industry'. Details: Ms Catherine Cox, BHR Group Ltd, Cranfield, Bedford MK43 0AJ. Tel: 01234 750422 Fax: 01234 750074

11th-14th

Belgium: '2nd International Conference on Pipeline Technology'. Details: Pipeline Technology Conference, Desguinlei 214, B-2018 Antwerpen, Belgium. Tel: 32 3 216 0996 Fax: 32 3 216 0689

11th-15th

Dundee: 'UK Oil & Gas Law'. Details: Ms Moira McKinlay, Summer Programme Registrations, Centre for Petroleum and Mineral Law and Policy, University of Dundee, Dundee DD1 4HN, Scotland. Tel: 01382 344303/344300 Fax: 01382 322578

12th-14th

Vienna: 'International Energy Markets'. Details: Euroforum Deutschland GmbH, Postfach 23 02 65, D-40088, Düsseldorf, Germany. Tel: 49 211 96 86 586 Fax: 49 211 96 86 502

12th-14th

Houston: '5th Pipeline Reliability Conference: Risk Management, Cost Benefit Analysis'. Details: Gulf Publishing Company, PO Box 2608, Houston, Texas 77252-2608 USA. Tel: 800 231 6275 Fax: 713 520 4438

13th

London: 'Farm in/Farm out'. Details: Petroleum Exploration Society of Great Britain. Tel: 0171 495 6800/5800 Fax: 0171 495 7808

13th-15th

Singapore: 'The 2nd Annual Asia Pacific Lubricants Conference'. Details: 140 Robinson Road, #06-01 Chow House, Singapore 0106. Tel: 65 227 6772 Fax: 65 222 6869

14th

London: 'Coalbed Methane in the UK'. Details: Lorraine Gettings, The Institute of Energy, 165-189 Railway Terrace, Rugby CV21 3HQ. Tel: 01788 578214 Fax: 01788 577182

14th-15th

Cambridge: 'Oil and Gas Field Unitisation'. Details: Langham Oil Conferences Ltd, 37 Main Street, Queniborough, Leicester LE7 3DB. Tel: 01509 881022 Fax: 01509 881576

18th-19th

London: 'The Commercial Implications of the new UK Network Code'. Details: SMI Ltd, 2nd Floor, 45 Curlew Street, Butlers Wharf, London SE1 2ND. Tel: 0171 417 7790 Fax: 0171 417 7791

19th

London: 'Making Profits and Not Losing Money by Dealing with Contaminated Land'. Details: Henry Stewart Conference Studies, Russell House, 28/30 Little Russell Street, London WC1A 2HN. Tel: 0171 404 3040 Fax: 0171 404 2081

19th-20th

Norway: 'The 7th Conference on the European Downstream Industries in a Changing Environment'. Details: Norwegian Petroleum Society, PO Box 1897, Vik, N-0124 Oslo, Norway. Tel: 47 22 43 00 50 Fax: 47 22 55 46 30

19th-20th

Wembley: 'Power - Everybody needs it'. The Independent Power Generation Conference & Exhibition. Details: PR & Publicity Department, FMJ International Publications Ltd, Queensway House, 2 Queensway, Redhill, Surrey RH1 1QS or INPOWER Hotline. Tel: 01737 768611 Fax: 01737 761685

21st-22nd

New York: 'Advanced Pricing & Trading Standards for Competitive Energy Risk Management'. Details: AIC Conferences, 50 Broad Street, 19th Floor, New York, NY 10004 USA. Tel: 212 952 1899 Fax: 212 248 7374

24th-28th

Abu Dhabi: 'The Middle East Gas Summit 1995'. Details: IBC Gulf Conferences, Rais Hassan Saadi Building, PO Box 15078, Dubai, UAE. Tel: 9714 552 500 Fax: 9714 527 455

25th-26th

Birmingham: 'APEA '95 Conference and Exhibition'. Details: Dave Bucknall, Humberside Trading Standards, King Edward Street, Grimsby, South Humberside DN31 3LU. Tel: 01472 341344 Fax: 01472 240529

25th-26th

Rotterdam: 'Terminal Operation and Static Measurement'. Details: Abacus International, 214 Incheon Road, South Woodham Ferrers, Essex CM3 5WU. Tel: 01245 328340 Fax: 01245 323429

25th-28th

Bedford: 'Pumps and the Plant Design Engineer'. Details: The Short Course Administrator, Department of Fluid Engineering & Instrumentation, School of Mechanical Engineering, Cranfield University, Bedford MK43 0AL. Tel: 01234 754766 Fax: 01234 750728 Telex: 825072 CRANUN G

26th-27th

London: 'Preventing and Managing Emergencies'. Details: Sarah Ashmore, Gilmora House, 57-61 Mortimer Street, London W1N 7TD. Tel: 0171 637 4383 Fax: 0171 631 3214

FORTHCOMING EVENTS

26th-28th

London: 'The Jack-Up Platform: Design, Construction & Operation'. Details: The Secretary, Ocean Engineering Research Centre, City University, London.
Tel: 0171 477 8140
Fax: 0171 477 8570

26th-28th

Warsaw: 'Stacja Benzynowa'. Details: Sylvia Leeman, Expoconsult B.V., Industrieweg 54, PO Box 200, 3600 AE Maarssen, The Netherlands.
Tel: 31 3465 73777
Fax: 31 3465 73811

26th-28th

Bromley: 'Understanding the Principles and Requirements of Accreditation and Certification'. Details: ST&C, Isobel Smith.
Tel: 0181 467 2636

27th

Aberdeen: 'The Impact of CRINE and Goal Setting Legislation on the Design of Offshore Safety Systems'. Details: Karen Whines, The Institute of Measurement and Control, 87 Gower Street, London, WC1E 6AA.
Tel: 0171 387 4949
Fax: 0171 388 8431

27th

Aberdeen: 'Offshore Noise & Vibration'. Details: Kathleen Ford, IMarE Conferences Department, The Institute of Mechanical Engineers, 76 Mark Lane, London EC3R 7JN.
Tel: 0171 481 8493
Fax: 0171 488 1854

27th-28th

Rotterdam: 'Flow Metering and Meter Proving'. Details: Abacus International, 214 Inchbonnie Road, South Woodham Ferrers, Essex CM3 5WU.
Tel: 01245 328340
Fax: 01245 323429

October

2nd-3rd

Kazakhstan: 'KIOGE '95 Projects Conference'. Details: International Trade and Exhibitions J/V Ltd, Byron House, 112a Shirland Road, London W9 2EQ, UK.
Tel: 0171 286 9720
Fax: 0171 286 0177
Telex: 896217

2nd-4th

The Hague: '1st International Underbalanced Drilling Conference & Exhibition'. Details: Holland Organising Centre, Parkstraat 29, 2514 JD, The Hague, The Netherlands.
Tel: 31 70 3657850
Fax: 31 70 3614846

3rd-4th

Istanbul: '1st LSM Black Sea Shipping Conference'. Details: St John Deakins, Lloyds of London Press, 1 Singer Street, London EC2A 4LQ.
Tel: 0171 250 1500
Fax: 0171 253 9907

4th

Aberdeen: 'Advances in Subsea Production and Downhole Equipment'. Details: Subsea Engineering News, 2 Marlborough Street, Faringdon, Oxon, SN7 7JP.
Tel: 01367 242525
Fax: 01367 241125

5th

London: 'Joint Conference with ETSU: Refining and Petrochemicals Industries'. Details: Caroline Little, The Institute of Petroleum.

5th-6th

London: 'Blending of Petroleum Products Training Course'. Details: SGS Redwood (UK) Ltd, Cornwall House, London Road, Purfleet, Essex RM19 1PA.
Tel: 01708 866855
Fax: 01708 868994
Telex: 25838

APPOINTMENTS

THE COLLEGE OF PETROLEUM AND ENERGY STUDIES

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TEAM BUILDING
PC APPLICATIONS TRAINING

CPES is a privately owned business based in Oxford, which occupies a unique position in the education of managers for the international oil, gas and energy industries.

Following a radical organisational review, CPES is building a new dynamic management team to grow the business internationally. To help achieve this, they have created a new management team post.

Marketing & Promotion Manager

c.£28,000+benefits

Responsible for promoting a quality image world-wide, via advertising and promotional literature. Working within the integrated sales and marketing strategy, this post provides the scope to develop and implement a new Marketing & Promotion plan for CPES. A critical element of this role is to source and up-date the existing mailing lists on the customer data base. It is envisaged that statistical analysis and market research for CPES will provide new sales and marketing leads.

At least five years senior level M & P experience, preferably with intimate contact with oil, gas and energy industry, including the ability to analyse computer-based statistical/market research is required. Quality vital will be your creativity, adaptability and team working to help grow and sustain a prosperous business.

In the first instance, write to Richard Ribbons of Taurus with your CV+passport size photo at the address below. Closing date: Friday 15 September.



8th-13th

Tokyo: 'World Energy Council 16th Congress'. Details: WEC PR Secretariat c/o Japan Convention Services Inc., 2-2-1 Uchisaiwai-cho, Chiyoda-ku, Tokyo 100, Japan.
Fax: 81-3-3508-0820

10th-12th

London: 'Trading LPG and Chemical Gases Training Course'. Details: SGS Redwood (UK) Ltd, Cornwall House, London Road, Purfleet, Essex RM19 1PA.
Tel: 01708 866855
Fax: 01798 868994
Telex: 25838

11th-13th

Aberdeen: 'FPSO World Congress and Technology Exhibition'. Details: Aberdeen Operations, The OCS Technology Group, The Innovation Centre, Aberdeen Offshore Technology Park, Exploration Drive, Bridge of Don, Aberdeen AB23 8GX.
Tel: 01224 708088
Fax: 01224 708080
11th-13th

Moscow:

'Benzokolonka '95'. Details: Sylvia Leeman, ExpoConsult BV, Industrieweg 54, PO Box 200, 3600 AE Maarssen, The Netherlands.
Tel: 3465-73777
Fax: 3465-73811

11th-13th

Aberdeen: 'FPSO Tech '95. Details: OCS Technology Group, The Innovation Centre, Aberdeen Offshore Technology Park, Exploration Drive, Bridge of Don, Aberdeen AB23 8GX.
Tel: 01224 708088
Fax: 01224 708080

15th-16th

Aberdeen: 'Learning From Real Partnering & Alliancing - Agreements Offshore to Cut Costs and Maximise Efficiency'. Details: IIR Ltd, 6th Floor, 29 Bressenden Place, London SW1E 5DR.
Tel: 0171 915 5055
Fax: 0171 915 5056

NEW MEMBERS

Miss R T Amoroso, Saudi Petroleum Overseas Limited, Berkeley Square House, Berkeley Square, London, W1X 5LE.
 Mr J Appels, Euroglas Analytical Instruments, Vollaweg 22, 2627 BC Delft, Netherlands.
 Mr P A Badjo, 279 Hardy House, Poynders Gardens, London, SW4 8PQ.
 Mr S D Banks, Flat 1/B Lok Fun Mansion, 8 Knutsford Terrace, Tsim Sha Tsui, Hong Kong.
 Mr S Becker, Institute of Environmental Analytical Chemistry, Universität Essen, Essen, Germany.
 Mr G E Blyth PR.ENG, Project Capital, P O Box 111, Kempton Park, 1620, South Africa.
 Mr S Brown, 46 Gildersdale Drive, Blackley, Manchester, M9 0SN.
 Mr N J A Colquhoun-Denvers, Fal Energy UK Limited, 7 Wimpole Mews, London, W1M 7TE.
 Mr G Doyle, ABV Rock Group, P.O. Box 89426, Riyadh 11628, Saudi Arabia.
 Mr G E Duncan, Park House, Park Lane, Milford on Sea, Lymington, Hants.
 Mr T Goater, Willis Corroon Hinton Ltd, 5-6 Hitching Court, Blacklands Way, Abingdon, Oxon, OX14 1RG.
 Miss M T Gonzalez, 110 Gloucester Road, London, SW7 4RJ.
 Miss K A Gribben, Ince & Company, Knollys House, 11 Byward Street, London, EC3R 5EN.
 Dr C Hewlett, Hornett Brothers & Co Limited, Ferry Lane, Rainham, Essex, RM13 9YH.
 Mr B J Hunt, Halkis 6, 16561 Ano Glyfada, Athens, Greece.
 Mr N J A Johnson, Johnson Hall & Co Ltd, 93 Goror Road, Ystradgynlais, Swansea, SA9 1DS.
 Mr T W K Jui, Zhu Wing Development Ltd, Suite 1705 Tower 11, The Gateway, 25 Canton Road, Tsimshatsui Kowloon, Hong Kong.
 Mr R L Macintosh, Butt Lodge, 19 Butt Park, Stokenham, Kingsbridge, South Devon TQ7 2SM.
 Mr N M S Mirza, 36 Essex Road, Leyton, London, E10 6HF.
 Miss A Muhtasib, Saudi Petroleum Overseas Limited, Berkeley Square House, Berkeley Square, London, W1X 5LE.
 Mr N F O'Reilly, Koenigssegstr 2, D-79618 Reinholden, Germany.
 Mr J L Page, Gulf Oil UK Ltd, Rosehill, New Barn Lane, Cheltenham, Glos, GL52 3LA.
 Mr D Panaz, DEP-Public Petroleum Corp of Greece, SA 357-359 Messongion Ave, GR 152 31 Halandri Athens, Greece.
 Mr S I Paterson-Fyfe, 24 Van Gogh Court, 89 Amsterdam Road, Isle of Dogs, London, E14 3UY.
 Mr R H Pritchard, 16 Peacocks, Warwick, Warks, CV34 6BS.
 Mr J D Roberts, 36 Bedeburn Road, Whorlton Grange, Newcastle Upon Tyne, NE5 4JN.
 Mr T Saleem, 70 Fieldend Road, Streatham Vale, London, SW16 5SU.
 Mr R Scurluck, Scitor, Scitor House, Yanwell Business Park, Norden Road, Maidenhead, SL6 4UB.
 Mr E Strevlos, DEP-Public Petroleum Corp of Greece SA, 357-359 Messongion Ave, GR 152 31 Halandri Athens, Greece.
 Mr M C Swiatkiewicz, Case Chemical Consultancy Limited, Unit 202 Solent Business Centre, Millbrook Road West, Southampton, SO15 0HW.

Mr A Tzouros, DEP-Public Petroleum Corp of Greece SA, 357-359 Messongion Ave, GR 152 31 Halandri Athens, Greece.
 Mr R J Upson, 20 Goldenacres, Chelmsford, Essex, CM1 5YT.
 Mr M Vaughan, Savills, 21 Chelborough Close, Lytchett Matravers, Dorset, BH16 6DJ.
 Mr C F Wong, Carmichael & Clarke Co Limited, 1202 Unicorn Trade Centre, 131 Des Voeux Road, Central, Hong Kong.
 Flt Lt M J Wood, MOD, Cyprus Logistics Unit, RAF Akrotiri, BPFO 57 Cyprus.
 Mr M Wressell, Lindsey Oil Refinery, South Killingholme, Grimsby, South Humberside, DN40 3LW.

STUDENTS

Mr M Al-Hariri, 60B Kenway Road, Earls Court, London, SW5 0RA.
 Miss Y Amiri, Flat 12a, 147-149 Gloucester Terrace, London, W2 6DX.
 Mr A J Blake, 99 Clapham Common, West Side, London, SW4 9AZ.

STUDENT PRIZEWINNER

Mr M A Inglis, 15/4 Kingsknowe Place, Edinburgh EH14 2EQ.

NEW FELLOWS

Sir David Simon CBE

Sir David Simon became Chairman of the British Petroleum Company plc on 1 July. Educated at Christ's Hospital and Gonville and Caius College in Cambridge, he spent his first years in marketing in Europe. In 1965-66 he attended the postgraduate MBA course at the European Institute of Business Administration (INSEAD) at Fontainebleau. He was appointed a BP Group Managing Director in 1986, becoming Deputy Chairman and Chief Operating Officer in 1990 and Group Chief Executive in 1992.

Sir David joined the Court of the Bank of England this year and has been a non-executive director of Grand Metropolitan plc since 1989. He is a member of the Advisory Board of Deutsche Bank, the International Council of Allianz AG Holding and the International Council of INSEAD. He is a member of the European Round Table of Industrialists and in March 1995 was asked to join the European Competitiveness Advisory Group formed to advise the President of the European Commission and European Council. In July 1990 he received an honorary D.Sc. in Economics from the University of Hull. He was knighted in the 1995 Queen's Birthday Honours List and was awarded a CBE in the 1991 New Year Honours List.

Mr A W Risley

In 1994 Mr Allyn Risley became Chairman and Managing Director of Phillips Petroleum Company (UK) Limited, responsible for E and P operations. This year he has also assumed responsibility for downstream UK operations. He was previously Vice President, Drilling and Production, Exploration and Production Group, Phillips Petroleum Company, based in Bartlesville, Oklahoma. Before accepting this position in 1992, he was worldwide Drilling and Production Manager and also manager of

UK Deliveries into Consumption (tonnes)

Products	June 1994	June 1995	Jan-June 1994	Jan-June 1995	% Change
Naphtha/LDF	226,336	235,700	1,467,688	1,567,420	7
ATF - Kerosene	688,676	685,519	3,435,143	3,493,777	2
Petrol	1,928,296	1,804,896	11,192,457	10,659,760	-5
of which unleaded	1,104,254	1,125,332	6,301,793	6,551,501	4
of which Super unleaded	119,988	79,706	696,765	490,192	-30
Premium unleaded	984,266	1,045,626	5,605,028	6,061,309	8
Burning Oil	113,372	138,429	1,492,076	1,483,061	-1
Derv Fuel	1,097,717	1,129,167	6,187,516	6,556,141	6
Gas/Diesel Oil	558,497	529,092	3,899,527	3,742,500	-4
Fuel Oil	746,325	570,668	4,976,588	4,208,476	-15
Lubricating Oil	72,967	79,139	397,319	447,055	13
Other Products	833,979	771,217	4,202,145	4,467,900	6
Total above	6,266,165	5,943,827	37,250,459	36,626,090	-2
Refinery Consumption	541,534	534,433	3,176,431	3,125,841	-2
Total all products	6,807,699	6,478,260	40,426,890	39,751,931	-2

* Revised with adjustments *preliminary

International and Utility Sales in the marketing division of Phillips 66 North America Company.

Mr Risley began his career with Phillips in 1972 as a graduate engineer with assignments in England, Norway, Abu Dhabi, the UAE and Venezuela. He advanced through various international engineering and management positions before being promoted in 1982 to Engineering Staff Director and two years later to Interim Operations Manager in Singapore for the Asia division. In 1984, Mr Risley became District Superintendent in Great Yarmouth and later Manager of Drilling and Production in the UK division of exploration and production. Mr Risley is a registered professional engineer for the state of Kansas and is a member of the Society for

Petroleum Engineers. He is past chairman of the SPE's Singapore section.

Mr R Berends

Mr Berends joined Royal Dutch Shell in 1972 and worked in Holland, Indonesia and Australia until he joined Chevron Overseas in 1980 in San Francisco, California and worked in Spain, Bolivia and Yugoslavia. In 1992 he accepted a one-year contract to work for the YPF (World Bank) as Manager of Planning and Strategy Upstream. In 1993 he joined Bidas International as Vice President, Business Development and is now based in Bidas International's office in London.

AROUND THE BRANCHES

ABERDEEN

Secretary: Dr G Wood, J P Kenny Caledonia Ltd, Holburn House, 485 Union Street, Aberdeen.
Tel: 01 224 851044 Fax: 01 224 581735

1995

10 October (tbc): *The Consequences of Competition in the Gas Market*
Dr Norman Ellis MD Kinetica.

14 November: *Magnus: Developing a Mature Asset*
Ian Cook, Development Team Leader, BP Exploration, Will Banks, Project Manager, Asset Engineering Alliance.

12 December: *The Abandonment of Large North Sea Platforms*
Tim Watson, North West Hutton Resource Group Amoco (UK) Exploration Company.

1996

9 January: *The Fife Project*
Tim Kieft, Project Manager for Fife Project AGM, Shell UK Offshore Co-ordination Centre, 1 Allens Farm Road, Aberdeen.

13 February: *Impact of Innovation on Future Prospects for the Norwegian Sector*

Dr Arid Nystad, Director Petroleum Resource Management Division, Norwegian Petroleum Directorate.

9 April: *Current Oil Exploration and Development in Azerbaijan, Eddie Whitehead, BP.*

14 May (tbc): *The 1994 Technology Award Winner*
K Feamley, Expro, North Sea.

EDINBURGH & SOUTH EAST SCOTLAND

Secretary: Dr R Hutchinson, Polyethylene Group Offices, BP Chemicals Ltd, P O Box 21, Bo'ness Road, Grangemouth, Stirlingshire FK3 9XH.
Tel: 01 324 493339 Fax: 01 324 493147

1995

2 October: *Intrinsic Safety*
Don McIvor of MTL (joint meeting with Institute of Management & Control).

Late October: *Young Students' Visit to BP Grangemouth.*

30 November: *A Layman's Guide to Vacuum Drying*
Warren Johnson, Managing Director, Hydrotesting Consultants Ltd (joint meeting with Pipeline Industries Guild).

1996

12 January: AGM, No speaker - buffet to follow meeting.

8 February: *Annual Student Lecture*
The Role of Technology Licensing in a Major Company

Martin Howard, General Manager, Licensing Business, BP Chemicals.

February (tbc): *West of Shetland Projects*
Speaker from BP Exploration (joint meeting with Institution of Chemical Engineers).

May (tbc): *Annual Spouses' Event Erica's Plants*
Visit to Royal Botanic Garden, Edinburgh.

ESSEX

Secretary: A L Carson Esq, 471 Kents Hill Road, North Thundersley, Benfleet, Essex SS7 4AD.
Tel: 01 268 794615

1995

11 October: *Applications for Nitrogen in Petroleum Storage and Distribution Industry*
Messrs Robinson, Plumb, Karim and Rawles of K Linde Gas UK Ltd.

8 November:

Ladies Evening: *Garden Topics*
Neville Fisher of Tomlins Nurseries.

1996

10 January: *National Vocational Qualifications in the Petroleum Industry*

Mike Wood, Health and Safety Manager, Powell Duffryn Storage Ltd.

14 February: *Automotive Fuels for the Future*
Andrew Harrison, Shellhaven Oil Refinery, Shell UK Ltd, Downstream Oil.

13 March: *Ground Water Protection and Risks from Petroleum Storage*

Officer from National Rivers Authority

15 March: *Annual Dinner/Dance at Baron's Banqueting Suite, Southend-on-Sea.*

HUMBER

Secretary: Phil Ranson, List Design Group, RJA House, Manby Road, Immingham, South Humberside DN40 2DW.
Tel: 01469 571888

1995

7 September: *Visit to Lindsey Oil Refinery.*

5 October: *British Steel Challenge (the Toughest Yacht Race Ever)*
Keith Mundell.

27 October: *Annual Dinner/Dance, Beachcomber Club, Humbershire.*

23 November: *Grimsby's Information Superhighway Communications*

Steve Boon of Diamond Cable.

1996

18 January: *Impact to Condam Regs*
David Warden of National Power.

1 February: *Visit to the Grimsby Evening Telegraph.*

1 March: *Annual Dinner, Beachcomber Club, Humbershire.*

28 March: *Ladies Night, Beachcomber Club, Humbershire.*

9 May: *Advances in Medical Techniques.*

LONDON

Secretary: Edith Walker, Conoco, Ltd, Conoco Centre, Warwick Technology Park, Gallows Hill, Warwicks CV34 6DA.
Tel: 01926 404257

1995

24 October: *Exploration.*

November (tba): *Production (at Imperial College).*

1996

23/24 January: *Refining.*

20 February: *IP Week, Special Event.*

19/20 March: *Supply & Distribution.*

23/24 April: *Marketing/Retailing.*

21/22 May: *Special Products.*

5 June: *Visit to Ford Motor Company.*

MIDLANDS

Secretary: David Johnson, Houghton Vaughan plc, Legge Street, Birmingham, West Midlands B4 7EU.
Tel: 0121 359 6100

1995

20 September: *Oil Additives*

A presentation by Henri-Jean Caupin of Elf Atochem (joint meeting with the Midlands Branch of the BLF, to be held at the Moat House Hotel, West Bromwich).

18 October:

Convenience Shopping and Fuel
A presentation by Elwyn Davies of A P Blakemore & Sons (Spar) Ltd, to be held at Conoco Ltd, Conoco Centre, Gallows Hill, Warwick.

- 15 November:** *Bioremediation Technology: Environmentally Compatible Solution for Contaminated Land, Ground Water and Industrial Effluents*
A presentation by Dr Paul Jackson of International Bioremediation Services Ltd at Houghton Vaughan plc, Legge Street, Birmingham.
- 16 November:** *A Night at the Dogs*
An evening at Perry Barr Greyhound Stadium. Details will be circulated.

- 1996**
17 January: *Under Pressure Engineering*
A presentation by Allan Petrie of Furmanite Ltd at the Moathouse Hotel, West Bromwich.
- 21 February:** *AGM - details to be circulated*

- 20 March:** *Multi-Product Pipeline and Distribution Control Systems*
A presentation by Alan Senice, Group Manager of the Pipelines and Terminal Automation Group of Salem Automation Ltd at the Moathouse Hotel, West Bromwich.

- 17 April:** *Heavy Fuel Oil: An Essential Element of the Industrial Fuels Portfolio*
A presentation by Mike Drew, Industrial Fuel Consultant at Gulf Oil (GB) Ltd, Rose Hill, Newbarn Lane, Cheltenham.

- Secretary:** J M Sparke, Phillips Petroleum Co UK Ltd, Seal Sands, Middlesbrough, Cleveland TS2 1UH.
Tel: 01 642 546411 Fax: 01 642 546096

- 1995**
17 October: *Vapour Collection and Recovery for Road Tanker Loading Terminals*
A A Sangster, Institute of Petroleum.

- 3 November:** *IP/PITANE Social and Quiz, Hallgarth Manor Hotel, Durham.*

- 1996**
31 January: AGM, followed by presentation on *Transport of Heavy Loads*

- 6 March:** *Wind Energy*
Dr G Jenkins, Northern Energy Associates.

- 17 April:** *Vapour conservation for oil terminals*
T Williamson and I Morrow Whesoe Vares Ltd

- May (tbc):** Visit to Enron Power Station, Wilton.

- Secretary:** **NORTHERN**
Dr P Miles, 13a Carrwood Avenue, Bramhall, Stockport, Cheshire SK7 2PX.
Tel: 01 61 439 3183 Fax: 01625 501839

- 1995**
31 August: Annual Golf Day, Dunham Forest (Contact David Bell 0161 477 5858).

- 17 October:** *Hazardous and Controlled Waste*
Adrian Wade, Robinson Bros Disposals Ltd, Belfry Hotel, Handforth.

- 21 November:** *Environmental Lubricants*
Dr Stephanie Harold, Lubrizol (UK) Ltd, Belfry Hotel, Handforth.

- 24 November:** Annual Dinner/Dance, Belfry Hotel, Handforth.

- Secretary:** **STANLOW**
John Wellsted, Castrol UK Ltd, P O Box 14, Bridges Road, Ellesmere Port, South Wirral L65 4ER.
Tel: 0151 355 3737 Fax: 0151 356 8098

- 1995**
27 September: Wine Tasting Evening at Paul Quellyn Roberts, Chester.

- 11 October:** *CFC Alternatives*
Peter Clayton, ICI, KLEA at Park Royal Hotel, Stretton, Warrington.

- 10 November:** Annual Branch Dinner/Dance, Village Hotel, Bromborough.

- 23 November:** *Fibre Optics*
Professor G Jones of Liverpool University, Village Hotel, Bromborough.

- 1996**
24 January: AGM, followed by:
Combined Cycle Power Generation at Connah's Quay
Ian Jenkins, Powergen at Shell Thornton Research Centre (provisional)

- 6 March:** *Developments in Fuel/Fuel Additive Technology*
David Blackmore, Shell Research at the Queen Hotel, Chester

- Secretary:** **SOUTHERN**
Maurizio Malpiedi, Esso Petroleum Co Ltd, Fawley Refinery, Fawley, Southampton SO4 1TX.
Tel: 01703 896021

- 1995**
September (tbc): *International Branch Oil Trading*
October (tbc): *Engineering in a Professional Motor Racing Team*
4 November: IP Ball
December (tbc): *Oil from coal*

- Secretary:** **SOUTH WALES BRANCH**
I J Thomas, BP Oil Llandarcy Refinery Ltd, Britannic House, Llandarcy, Neath, West Glamorgan, SA10 6HJ.
Tel: 01792 322269

- 1995**
21 September: *Edutainment*
Gavin Nicholls, IBM GULF Oil Refinery, Milford

- 17 October:** Visit to Second Severn Crossing

- 23 November:** *Business and the Environment*
Dr Clive Morgan, Ridgeway Environmental Management, Texaco Refinery, Pembroke

- 1996**
23 January: *Remote Sensing*
Nigel Robbins, BP Oil Llandarcy Refinery Ltd

- 23 February:** AGM and Flower Pressing, Mrs Enid Wade, Savoy Country Inn, St Clears

- 22/23 March:** Weekend visit to Telford

- 28 March:** *Performance Additives*
Bill Bayllet, Lubrizol, ELF Refinery, Milford Haven

- 30 April:** *Value Engineering*
Kimberley Dere-Edwards, B P Chemicals, BP Oil Llandarcy Refinery Ltd

- Secretary:** **WEST OF SCOTLAND**
A Lowson, 2 Wylie Avenue, Newton Mearns, Glasgow G77 6AX.
Tel: 0141 639 4716

- 1995**
14 September: Annual Golf Tournament (by ticket) Ralston Golf Club, Paisley

- 26 October:** *Celebrity Lecture (by ticket), Heinz Rotterdam, MD of Shell UK E&P, at Strathclyde University*

- 1996**
7 March: Petroleum Dinner (by ticket), Hospitality Inn, Glasgow

- Secretary:** **YORKSHIRE**
I Bennet Esq, Millers Oils Ltd, Hillside Oil Works, Brighouse, West Yorkshire HD6 3DP.
Tel: 01 484 713201

- 1995**
21 September: Ladies Evening, visit to Tetley's Brewery Wharf, Leeds.

- 10 October:** Castrol and Motor Sport

- 14 November:** *Volvo Engines and the Future*
MT McAlaery, Product Information Manager
Chairman's Dinner

- December:** **1996**
9 January: *Automobile Engine Lubrication - some research issues and needs*
Dr Chris Taylor, Head of Mechanical Engineering, Leeds

- 13 February:** AGM/Hot Pot Supper - Sporting Moments - Guest speaker John Morgan, Sports Journalist and Broadcaster

- 12 March:** *Waste Management and the Environment*
R Crouch, West Yorkshire Waste Regulation Authority (joint meeting with Institute of Energy)

- 15 March**
12 June: Annual Dinner/Dance
Golf Tournament



THE INSTITUTE
OF PETROLEUM



'Turning the Vision into Reality'

1994 CRINE Conference Proceedings

These proceedings cover the CRINE (Cost Reduction Initiative for the New Era) conference held in Aberdeen on 24th November 1994.

The theme for the conference was 'turning the vision into reality'. Four main sessions were chaired by key industry figures and featured presentations made by speakers directly involved in the application of the CRINE principles. There was also a strong focus on the future for CRINE and the guest speaker was Tim Eggar MP, Minister for Industry and Energy.

The proceedings include a complete transcript of all presentations, as well as questions from the floor, answered by the panel of speakers, together with an open discussion session at the close of the conference. There is an appendix of display materials from the exhibition stands, detailing specific best practice examples aligned to the principles of CRINE.

The proceedings are published on behalf of the CRINE Secretariat by the Institute of Petroleum. This new publication provides a valuable insight into the progress made during 1994, as well as the plans for the future. It is an essential reference for anyone involved with the upstream industry and a valuable guideline on what can be achieved on reducing costs.

This publication is available from the Library, The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR.

ISBN 0 85293 157 3 £54.50 (overseas £62.50)
No discount to IP members



THE INSTITUTE
OF PETROLEUM

Developments in Energy Efficient Technologies for the Refining and Petrochemical Industries

4 October 1995

This joint IP/ETSU Conference will be held at The Institute of Petroleum, London

The aim of the conference is to update the refining and petrochemicals industry on the results of R&D and new improved practices that are applicable to the refining and petrochemicals sector, and which can lead to significant energy and cost savings. This work is being undertaken under the Energy Efficiency Office's Best Practice programme, the industry part of which is managed by ETSU.

Papers will be presented on the following topics:

- Best Practice Programme
- Heat Exchanges and Waste Heat Recovery
- Fouling of Compact Heat Exchangers
- Exchanger Inserts
- New Distillation Techniques
- Tray Improvements
- Training and Motivation
- Advanced Computer Control
- Furnace Efficiency

For further information, please contact
Conference Department, The Institute of Petroleum,
61 New Cavendish Street,
London W1M 8AR UK

Telephone: 0171 467 7100 Fax: 0171 255 1472



THE INSTITUTE
OF PETROLEUM

New Developments in Aviation Fuel Handling

28 November 1995

To be held at the Cavendish Conference Centre,
London

Papers on the following subjects will be presented:

- Historical Review of Fuel Filtration Standards
- The Review of API 1581
- An Airline View on Aviation Fuel Filtration Standards
- An Engine Manufacturer's Perspective on Fuel Filtration
- Velcon's API 1581 4th Edition Consideration
- IP R&D Review
- Environmental Issues, including Leak Detection and Containment
- Apron Fuelling Incidents

*For further information and a copy of the registration form, please contact Conference Department, The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR UK
Telephone: 0171 467 7100 Fax: 0171 255 1472*



THE INSTITUTE
OF PETROLEUM

Biodegradable petroleum products and the environment

18 October 1995

To be held at the Institute of Petroleum

Topics to be presented will include:

- Environmentally responsive technology and cost effectiveness
- Pathways of Biodegradation
- Biodegradability Tests for Surfactants
- Biodegradability Tests for Petroleum Products
- Biodeterioration! A Consequence of Biodegradability
- 'Green Fuels'
- Soil Remediation

*For further information and a copy of the registration form, please contact Conference Department, The Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR UK
Telephone: 0171 467 7100 Fax: 0171 255 1472*

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The Safe Handling of Pressure Liquefied Flammable Gases

16/17 November 1995
Mount Royal Hotel, London

HIGHLIGHTS INCLUDE:

- Legislation and Guidance (Codes of Practice) ● Consequence Effects ●
- Storage, Transport and Handling ● Prevention and Protection Techniques ●
- Risk Assessment ● Emergency Response ●

KEY CONTRIBUTIONS FROM:

- HEALTH & SAFETY EXECUTIVE ● SHELL RESEARCH LTD ● THE UNIVERSITY OF NEW BRUNSWICK, CANADA ●
- AEA TECHNOLOGY ● INSTITUTION OF CHEMICAL ENGINEERS ● OFFSHORE SAFETY DIVISION - HSE ●
- ENMAT INTERNATIONAL ● DNV INDUSTRY LTD ● DEPARTMENT OF TRANSPORT ●
- UNIVERSITY OF WALES, ABERYSTWYTH ● HEALTH & SAFETY LABORATORY ● SHELL INTERNATIONAL ●

Large quantities of flammable gases are stored and transported as pressurised liquids (eg LNG, LPG, Butane). It is the ability to store, transport and process certain gases in liquid form which makes them commercially attractive. However, from a safety viewpoint it is this which makes them so hazardous.

Pipeline rupture and fire engulfment are the most likely events to initiate a partial or catastrophic failure of containment and when the pressurised contents are released there is a risk to plant, workers and the public from toxic and flammable gas clouds, thermal radiation effects from fire and explosion, and blast.

It is because of this that large inventories of liquefied gases are considered to be potential major industrial hazards. Consequently, regulations and codes of practice prescribing precautions and procedures are aimed at controlling the risk. In parallel, methodologies have been developed for assessing the hazards and the risks posed. An integral part of this assessment is the need to utilise mathematical models and modelling techniques both to assess and predict the hazards and their consequences.

A considerable amount of research effort at both national and international level is aimed at producing quality experimental data which in turn are used to validate suitable models also being developed.

The Conference will give an overview of the current position and will provide up-to-date information on: legislation and guidance (codes of practice) storage, transport and handling; risk assessment; consequence effects, including research and modelling activities in the fields of gas dispersion and vapour cloud explosions; prevention and protection techniques, including active and passive means of fire protection of tanks, and pressure relief; emergency response.

This Conference should not be missed by plant designers and operators; safety and loss prevention managers and engineers; regulatory bodies and researchers.

THURSDAY 16 NOVEMBER 1995

09.00 Registration and Coffee

Session One: Legislation and Guidance on LPG Handling and Storage

Session Chairman: John Barton
Consultant

09.30 INCIDENTS, LEGISLATION AND GUIDANCE: AN OVERVIEW

- Review of incidents and guidance
- Developments in Europe; new Directives and Standards affecting equipment
- New UK legislation covering pipelines and gas supplies

Speaker: Jim Sykes
Acting Head, Process Safety Unit
Health & Safety Executive

10.20 Morning Coffee

10.50 SAFETY MANAGEMENT OF AN LPG PLANT

- Overview of safety considerations
- Reference to the application of appropriate regulations

Speaker: David Gelder
Consultant

11.20 THE OFFSHORE INSTALLATIONS (PREVENTION OF FIRE AND EXPLOSION, AND EMERGENCY RESPONSE) REGULATIONS 1995

- The goal-setting philosophy of the new offshore regulations
- The main legal requirements of the "PFEER" regulations
- Some guidance on interpretation
- Some examples to illustrate

Speaker: Dr Phil Brighton
Principal Inspector, Offshore Safety Division
Health & Safety Executive

12.00 Panel Discussion with Morning Chairman and Speakers

12.20 Lunch

Session Two: Storage, Transport and Handling

Session Chairman: John Barton

13.40 DESIGN, INSTALLATION AND INSPECTION OF LPG TANKS AND CYLINDERS

- The relationship between legislation, design codes and operational requirements
- Cylinder types and their application
- Cylinder equipment – valves and regulators
- Safe cylinder filling – maintenance, inspection and testing
- Tank types and sizes, and the associated safety requirements

Speaker: Eur Ing Don Barber
Principal, Enmat International
UK Representative to the LPG committee of the International Gas Union

14.20 TRANSPORT OF LIQUEFIED GASES

Speaker: Vincent Matley
Dangerous Goods Branch
Department of Transport

14.50 PLANNING FOR THE "HIGH-REALITY" EMERGENCY

- Developing "High-Reality" scenarios
- Planning effective responses
- Testing the plan(s)
- Implementing the lessons

Speaker: Dr Gary Kenney
Director of Client Services
DNV Industry Ltd

15.20 Afternoon Tea

Session Three: Risk Assessment

Session Chairman: Professor David Bull
Manager, Combustion and Hazards Research
Shell Research Ltd

15.40 RISK ASSESSMENT – A TECHNICAL OVERVIEW

This paper will address:

- the role of risk assessment in the management of major hazards
- the fundamentals of quantified risk assessment in a risk management approach
- aspects of uncertainty in quantified risk assessment
- the locus of tolerability criteria in the context of risk management in a national and international context

Speaker: Neil Morton
Superintending Specialist Inspector
Major Hazards Assessment Unit
Health & Safety Executive

16.20 QUANTIFIED RISK ASSESSMENT FOR LIQUEFIED GAS INSTALLATIONS (RISKAT)

- Brief overview of the use of quantified risk assessment (QRA) for liquefied flammable gases
- Outline of HSE's risk assessment tool (RISKAT) for LPG and illustration of its use
- Handling the uncertainties

Speaker: Dr Clive Nussey
Consultant

17.00 RAISING AWARENESS OF SAFE HANDLING

- Making the case for awareness training
- Defining the training needs
- Structuring the training session
- Raising awareness of the hazards
- Monitoring training effectiveness

Speaker: Stephen Billington
Manager – Safety, Health and Environment
Institution of Chemical Engineers

17.40 Panel Discussion with Afternoon Chairman and Speakers

18.00 End of Day One

FRIDAY 17 NOVEMBER 1995

09.00 Delegate Check-in and Coffee

Session Four: Consequence Effects

Session Chairman: Neil Morton

09.15 OVERVIEW OF GAS EXPLOSIONS RESEARCH

- Introduction
- The consequences of a gas explosion
- Overview of current developments on predictive tools
- Overview of experimental work to validate the predictive tools
- Future developments and areas for further work
- Conclusions

Speaker: **Dr David Pritchard**

Head of Gas Explosions Section
Health & Safety Laboratory

09.55 FIREBALL AND EXPLOSION MODELLING

- BLEVE fireballs
- Fireballs from ignition of pressurised releases
- Vapour cloud deflagration
- Modelling consequences

Speaker: **Simon Shield**

Senior Scientist
Shell Research Ltd

10.35 Coffee

10.55 HAZARD & RISK ANALYSIS IN THE LPG BUSINESS

- LPG safety management systems
- Setting safety distances using hazard analysis
- Appropriate data for quantified risk analysis in LPG marketing
- Decision making using quantified risk assessment

Speaker: **Dr John Tolchar**

LPG Hazard & Risk Analyst
Shell International

11.25 Discussion with Session Chairman and Speakers

Session Five: Prevention and Protection

Session Chairman: Keith Moodie

Head, Process Hazards Group
Health & Safety Laboratory

11.40 FIRE PROTECTION OF TANKS

- CEC JIVE project
- Jet-fire engulfment of unprotected tanks
- Consequences of tank failure
- Jet-fire engulfment of water deluge protected tanks
- Jet-fire engulfment of tanks protected by passive fire protection material

Speaker: **Dr Terry Roberts**

Process Safety Section
Health & Safety Laboratory

12.20 MODELLING THE FIRE EXPOSURE OF LPG TANKS: A CASE STUDY OF THE STE ELIZABETH DE WARWICK TANK FAILURE

- A 1000 US gallon, horizontal propane tank suddenly circumferentially separated at its central section while under fire attack near Ste Elizabeth de Warwick on 28 June 1993

- The vessel was exposed on one side, one end and its top to fire burning on the walls of a barn and its attached milk house
- An analysis has been made of the possible thermal loading on the tank and its consequent thermal stress state
- This, along with an examination of some of the tank remnants, photographic and metallurgical evidence coupled with cone calorimeter testing of the paint coatings on the vessel, permits conclusions to be made relative to the reasons for the failure of the tank
- Recommendations will be made in order to prevent similar accidents in the future

Speaker: **Dr Jim Venart**

Director Fire Science Centre and Professor of
Mechanical Engineering
The University of New Brunswick, Canada

13.00 Lunch

14.10 MOUNDED AND BURIED LPG TANKS

- A high level, qualitative look at the risks involved in storing LPG in mounded or buried tanks
- A comparison of failure modes for mounded, buried and above-ground LPG storage facilities
- Review of existing guidance documents on mounded and buried LPG tanks
- An examination of the major hazards presented by such installations, with scenarios leading up to a release event illustrated by use of fault trees

Speaker: **Richard Robinson**

Senior Consultant
AEA Technology

14.50 SIZING PRESSURE RELIEF SYSTEMS FOR PRESSURE LIQUEFIED CASES

- Assessing causes of overpressure: external fire and process heating
- Brief review of design codes for sizing fire relief systems
- Insights from the AIChE Design Institute for Emergency Relief Systems (DIERS) on which vapour alone flows through the pressure relief system, and when a two-phase mixture will be relieved
- Methods for deciding the maximum fill level to ensure vapour alone is vented
- Methods for sizing relief systems for two-phase flow

Speaker: **Dr Jill Wilday**

Risk Assessment Methods Section
Health & Safety Laboratory

15.30 MITIGATION OF EXPLOSIONS BY WATER SPRAYS

- Historical use of water sprays for combustion mitigation and lessons learnt
- Recent studies of explosion mitigation by water sprays
- Fundamental physical and chemical basis for explosion mitigation
- Results of supporting laboratory studies
- Review of current status and remaining uncertainties

Speaker: **Dr Geraint Thomas**

Senior Lecturer
University of Wales, Aberystwyth

16.00 Panel Discussion with Session Chairmen and Speakers

16.15 Tea and Close of Conference

DATE	Thursday 16 and Friday 17 November 1995
VENUE	The Mount Royal Hotel Bryanston Street Marble Arch London W1 Telephone: 0171 629 8040 Nearest Underground: Marble Arch on the Central Line.
FEE	£579 plus VAT @ 17 1/2% which includes all technical sessions, lunch, refreshments and conference documentation. REDUCED RATES are available for charities and academics. Please call the London office for further information.

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Whilst we feel attendance at this event will offer maximum satisfaction, we recognise that some delegates may not be able to attend and for those we are offering the conference documentation at a cost of £130 per copy (UK addresses), £145 (other addresses). Only a limited number will be available, so it is important to reserve your copy early. Simply complete the appropriate box on the registration form and return to us with your payment. The papers will be sent to you immediately after the event.

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EXHIBITION SPACE

A limited number of exhibition spaces are available at this event giving an excellent opportunity for companies to display their wares to a selective audience.

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Nominations for Council 1996

Notice to Members

Clause 21 of the By-Laws states, inter alia, that the Council of the Institute shall have the following membership:

- (a) The President, the President-Elect or Past President, the Honorary Secretary and the Honorary Treasurer.
- (b) 12 elected individual members of the Institute.
- (c) 6 individual members of the Institute, nominated by Council.
- (d) 3 individual members of the Institute, recommended by Branches.
- (e) The Director General shall be a non-voting members of Council.

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

There are vacancies for ordinary members (see (b) above) for the election 1996, some of these vacancies are caused by the retirement of members of the Council as listed below.

Nomination forms can be obtained from me and *must be returned to me by 31 December 1995*. The nomination form must be signed by a proposer, three other members and the nominee. No member may sign more than one nomination paper as a proposer or supporter.

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

<i>Name</i>	<i>Company</i>	<i>Field of Activity</i>	<i>Class of Membership</i>
*P Algar	Energy Information Services	Partner	Fellow
P L Barlow	Retail Motor Industry Federation	Environment, Health & Safety Advisor	Fellow
*R B Colomb	General Manager	Petroleum Employers Council & Petroleum Employers Skills Council	Fellow
*J P Hargreaves	Oryx UK Energy Co	Senior Planner	Member
*D Krahn	International Assoc of Drilling Contractors	Director, European Offshore Affairs	Member

*Eligible for re-election

August 1995

I Ward
Director General

(Article 23 and By-Laws 21 and 33-37 cover the election of Council Members)