Petroleum review

DECEMBER 1999

Asia-Pacific survey

- Round-up of regional oil and gas projects (Part 2)
- Focus on Laminaria/Corallina development

Shipping

Tough times for tankers

E-commerce

- BP Amoco driving hard for e-business
- Getting IT right
- Legal and accounting challenges on the Net
- Energy trading and inventory control

Covering the international oil and gas industry from field to forecourt – exploration, production, refining and marketing

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Training Courses 2000

Following the successful launch of its portfolio of Training Courses for 2000, the IP will not only repeat its programme, but will increase the number of courses provided, together with the range of topics covered. Each new topic has been selected in response to known, but unsatisfied, demand from the IP's membership and industry players, and seeks to complement the existing range of courses on offer.

The extended programme has been drawn together based upon the same principles of acting as the 'commissioning partner'. This entails working in close liaison with reputable organisations noted for their expertise in delivering training in their particular industry sector. Training Courses 2000 will ensure that the content is not only bespoke and of high quality, but is also of relevance to the industry today and equips the delegates with new and practical skills which can be readily translated into the work-place. This will ultimately enhance their own performance to the benefit of their company.

The number of training providers will double to reflect the increase in new areas to be covered next year. These will include:

- Aviation
- Environmental Risk Management
- Loss Control
- Boundary Management
- Service Contracts Arranging & Management
- Microbiology
- Geology

In addition, IP courses related to: Trading, Price Risk Management, Oil Industry Operations and Economics, Refinery Operations, and Financial Accounting, will all be repeated in 2000.

INVINCIBLE

Dates already confirmed before going to press :

Trading Oil on the International Markets	**ITO**	**15–19 May 2000** **23–27 October 2000**
Price Risk Management in the Oil Industry	**PRO**	**5–9 June 2000** **27 November–1 December 2000**
Economics of the Oil Supply Chain	**ESC**	**27–31 March 2000** **16–20 October 2000**

A full calendar of the new training course programme will be released to all IP members before Christmas. Non-members of the IP can obtain their calender from the address below.

Nick Wilkinson, The Institute of Petroleum,
61 New Cavendish Street, London W1M 8AR, UK
Tel: +44 (0)20 7467 7151 Fax: +44 (0)20 7255 1472
e: nwilkinson@petroleum.co.uk

or view the IP website: **www.petroleum.co.uk**

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IP THE INSTITUTE OF PETROLEUM
A charitable company limited by guarantee
Director General: Jeff Pym
61 New Cavendish Street
London W1M 8AR, UK
General Enquiries:
Tel: +44 (0)20 7467 7100
Fax: +44 (0)20 7255 1472

EDITORIAL

Editor: Chris Skrebowski
Deputy Editor: Kim Jackson
Production Manager: Emma Parsons
The Institute of Petroleum
61 New Cavendish Street, London W1M 8AR, UK
Editorial enquiries only:
Tel: +44 (0)20 7467 7118/9
Fax: +44 (0)20 7637 0086
e: petrev@petroleum.co.uk
http://www.petroleum.co.uk

ADVERTISING

Advertising Manager: Jolanda Nowicka
Anne Marie Fox
Production: Catherine Meade
Landmark Publishing Services,
8 New Row, London WC2 4LH, UK
Tel: ***+44 (0)20 7240 4700***
Fax: ***+44 (0)20 7240 4771***

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ABBREVIATIONS

The following are used throughout *Petroleum Review*:

mn	= million (10^6)	kW	= kilowatts (10^3)
bn	= billion (10^9)	MW	= megawatts (10^6)
tn	= trillion (10^{12})	GW	= gigawatts (10^9)
cf	= cubic feet	kWh	= kilowatt hour
cm	= cubic metres	km	= kilometre
boe	= barrels of oil equivalent	sq km	= square kilometres
		b/d	= barrels/day
t/y	= tonnes/year	t/d	= tonnes/day

No single letter abbreviations are used. Abbreviations go together eg. 100mn cf/y = 100 million cubic feet per year.

Front cover: Barrow Island oil field, Australia, has been producing for more than 30 years.
Courtesy of Wapet Ltd

inside...

From the Editor

The e-xcitement of e-business

After 18 months of essentially gloomy industry news – low prices, poor results, redundancies, takeovers and mergers – it is wonderful to find an area of the industry that is exciting and highly optimistic. Those helping to Internet-enable the industry are distinguished by the fact that they are genuinely excited by what they are doing.

There is a very good reason that those developing e-business or e-commerce solutions for the industry have recaptured some of the excitement the whole industry once had. As Kathleen Dahlberg – BP Amoco's E-supremo – explained (see opposite) this is an area without detailed maps, sometimes without maps at all. It is an intellectual frontier, a place where previous systems, previous ways of doing things can be discarded and left behind, and new, better solutions devised.

Such an ability to, metaphorically, take a clean sheet of paper and start again from the beginning occurs very rarely in business. The companies who manage to capitalise on it will derive immense economic benefits and a considerable market edge. Those who fail, may fail absolutely. The stakes are very high indeed.

For most individuals the primary benefit of the Internet revolution has been e-mail. Already it is possible for globe-trotting backpackers to send and receive e-mail virtually anywhere in the world, from northern Thailand to southern Chile (this is direct personal testimony). Recent developments in wireless telephony means mobile phones will soon be able to receive e-mail virtually anywhere on the planet. However, this also means that a plant operator or a geologist in the field will be able to receive detailed instructions, plans, diagrams and similar data, cheaply and easily. This opens up a whole range of new ways of doing things and of backing up those in remote, difficult or dangerous locations.

The other area of increasingly common experience is buying over the Internet. There must be few who have not heard of **Amazon.com**. Exactly the same sort of purchasing economies are available to companies buying goods and services online. In addition, auction systems have been developed which are starting to find application in a range of business trading situations.

Various threads of the Internet revolution are now starting to come together – communication, information transfer, electronic procurement and financial transfers, auctioning, and remote monitoring and control – under the title of e-business. There is now little doubt that these new technologies will change the face of all business.

In this issue we have brought together a range of articles covering a variety of topics which can all be described as e-business. These range from BP Amoco's ambitious targets for transforming the way they do business (see opposite) to new ways of providing services to the industry (p22), specialist niche applications (p16), as well as some consideration of the legal issues (p24) and the implications for accounting and auditing (p19).

The subject is so large, so important and so fast moving that *Petroleum Review* has decided that from now on a number of pages in every issue will be devoted to e-commerce as this is currently some of the most valuable information we can provide to our industry readers.

As a result we are particularly keen to hear from companies and individuals developing and offering Internet-based services and solutions for the industry. It is also our intention to develop an e-commerce section on the Institute of Petroleum's website (**www.petroleum.co.uk**) to provide more coverage of e-business.

The billion-dollar question

Arguably the most important and possibly the most expensive well in the world is currently approaching its target. Kashagan-1 in the shallow waters of the northern Caspian is being drilled by the OKIOC consortium at a reported cost of an eye-watering $600mn, and rising.

However, the monumental cost is dwarfed by its politico-economic importance. The Kashagan formation is said to be geologically similar to the structure that yielded the mighty Tengiz field – only larger. All the hype about the Caspian being a new Kuwait, a new Middle East, are predicated on Kashagan being productive. Disappointment in the southern Caspian means that Kashagan is being looked to for the large volumes of oil to fill and justify the pipeline to Ceyhan in Turkey as well as to enrich Kazakhstan and bring prosperity to the region.

We must all hope that the well proves highly productive because if it turns out otherwise the fallout is likely to be a major downgrading of the whole Caspian region.

Chris Skrebowski

Web World

Websites are booming. Every conceivable topic is covered and use is expanding so rapidly that a number of key consumer websites have gone down as a result of overloading. Toys 'R' Us made a special Christmas offer and succumbed to the rush. Encyclopedia Brittanica has decided to become a free service – yes, a free service – at **Brittanica.com** However, it took three weeks for it to install enough capacity to cope – a salutary lesson.

The UK Department of the Environment, Transport and the Regions (DETR) has published new draft guidance on the extraction of coalbed methane. The consultation draft can be found on the DETR website at **www.planning.detr.gov.uk/consult/mpg/onshore/index.htm**

The DTI's BIO-WISE programme (**www.dti.gov.uk/biowise**) offers free and independent advice on how to use biotechnology to reduce your company's business costs and improve its competitive edge.

The Oil Price Information Service (OPIS) Spot Ticker, is a new Internet service which tracks cash prices for refined products in four key US markets. Price changes can be viewed live over the Internet during the trading day at **www.opisticker.com**

Syntroleum, the gas-to-liquids specialist, has a range of information about the company and the GTL technology at **www.syntroleum.com**

A comprehensive directory of the oil industry's role, along with facts, figures and trends within the industry are available online from the newly launched PINTO (Petroleum Industry National Training Organisation) website at **www.pinto.co.uk** The site contains news items and information about PINTO, along with details of the qualifications available within the industry.

UK market analysis company Datamonitor has launched a new Internet service to supply strategic business information on demand. The service – at **www.datamonitor.com** – gives the company's clients online access to the entire portfolio of Datamonitor information which spans global markets in eight core business sectors.

Internet events company Hamilton Nashe claims to be launching one of the biggest events on the Internet – **www.sustainability2000.org** Promoted globally to over 100mn people by Microsoft, the site is all about protecting our environment and making sure mankind's future is provided for.

However, the place to start any web-search remains the Institute of Petroleum's own site at **www.petroleum.co.uk** Now with over 500 pages of information and hundreds of links to related industry sites, the IP website is the key portal to industry information, data and knowledge.

BP Amoco driving hard for e-business synergies

Recent industry rumours have suggested that BP Amoco is planning for 95% of its procurement activities to be Internet enabled by end-2000. *Kathleen Dahlberg*, Vice President E-Business for BP Amoco, told *Petroleum Review* about the challenges of developing e-business at the company.

Asked about the development of the e-business programmes, Dahlberg explained that she had been appointed to the new post of Vice President E-Business in May when the company's e-business central programme got underway. Her previous post had been as Vice President for Information Technology for the downstream sector and, before that, she had worked for Viacom. She explained that at the present time only a limited proportion of BP Amoco's businesses were fully Internet-enabled, but that this was about to change quite radically in the very near future. Areas that would change ranged from procurement to systems that interacted with customers and ones that monitored equipment.

Asked how realistic BP Amoco's e-procurement targets were – the usual rumours are 50% by end-1999 and 95% by end-2000 – she suggested that it was 'not healthy to be too prescriptive about how the targets would be met', but that 'aggressive and non-prescriptive targets' were a good thing as they get everyone 'focused and motivated and allow for space for innovation'. Without committing to any specific targets she indicated that fairly rapid progress was now being made which meant that 'even the aggressive targets set are likely to be met'.

Confirming that BP Amoco has legacy systems from, and working relationships with, a number of the industry leaders such as IBM, Oracle and SAP, Dahlberg declined to comment as to which companies BP Amoco might be working with on the various e-business projects. She did note, however, that a great deal of evaluation work had been done and that various parts of the project were getting close to the point where contracts would be awarded. She noted that they aimed to work with companies that could be described as 'best in class' and that while some parts of the project would be multi-supplier, for others it might be appropriate to have a single vendor.

Asked about how the project was developed, she explained that the company had taken a systematic approach while moving forward on two broad fronts. One path focuses on direct reduction of costs and improved efficiencies and effectiveness of operations by means of such projects as e-procurement. The second strand is about improving links to, and knowledge about, the customers and ways to improve the value of the company's offers. This 'web enablement' — of which the company's recent initiative to put Internet links on forecourts is a good example — will improve the efficiency and effectiveness of links with the customer. The forecourt initiative also enables sites and site equipment to be continuously monitored.

'we're beginning by shifting our purchasing of basic catalogue items onto e-procurement by the end of this year. That covers around 15% of our total procurement spending of $20bn – but it accounts for over 50% of the number of individual transactions. In total we expect to save at least £200mn a year as a result'

Sir John Browne – presentation to financial analysts, July 1999

Asked about the possible problems in terms of law and security, Dahlberg explained that problems with secure communication had diminished significantly over the last two years, and that there is much greater confidence about system security. She noted, however, that any system involving the transfer of large sums of money would be a target for attack. The only satisfactory defense was 'aggressive diligence'.

In discussing the nature of the access portal for transaction with BP Amoco she explained that the company was actively reviewing the situation and possible designs. It was felt that the 'jury was still out' in terms of whether the oil companies would favour industry portals or whether they will tend to develop their own ones. In some senses the question may be overtaken by the development of web-crawler programmes as these will offer an alternative route to assessing rival opportunities or offerings. These programs could even be an alternative to sites that appear to need to be centralised, for example sites selling and reselling acreage (see LIFT story, p7).

Questioned as to whether the car industry with its recent public announcements about e-procurement initiatives was ahead of the oil industry, Dahlberg pointed out that the two industries were very different and that in a fast moving area like e-business, the concept of 'being ahead' wasn't necessarily useful. She continued by pointing out that e-business models were yet to be defined areas – a land without proper maps – so that everyone in the area was pushing out the frontiers and helping to define the possibilities. In BP Amoco alone there were already hundreds of projects and dozens of sites so there was no lack of opportunity to develop and define e-business.

BP Amoco is currently completing the integration of Amoco with BP and is getting ready to start on the incorporation of Arco. *Petroleum Review* asked Dahlberg whether this had inhibited the development of e-business. She explained that it had certainly 'added a bit more interest' but she did not think that it had slowed the process. She believed it may actually have facilitated the integration process as developing new business solutions is an effective way of getting individuals from different corporate backgrounds to work together as a team. 'Indeed, we have been developing and using web-based tools to facilitate rapid integration.'

She concluded by explaining that BP Amoco very definitely saw e-business as a major part of its competitive strategy for the future. Asked to speculate a little about the longer term future she explained that within five years large parts of the corporation would be fully electronic, paperless transaction would have arrived. Similar changes would apply to people's everyday activities. The development of linked electronic solutions was an irreversible change that would lead to a range of new service and product offerings. In her view, the oil industry would become less insular and more integrated with its suppliers and customers and this would be to the benefit of all.

NEWS Upstream

Seven Heads gas to serve Irish market

Ramco Energy, together with Duke Engineering & Services, Island Petroleum Developments and Sunningdale Oils (Ireland), has been granted a licensing option for the 'Seven Heads' oil and gas accumulation offshore Ireland. The option covers the southern halves of blocks 48/23 and 48/24, and the northern halves of blocks 48/28 and 48/29, in the North Celtic Sea Basin.

The 18-month work programme will include the evaluation of four wells previously drilled by Esso and Marathon on the Seven Heads structure over 1974–1990.

There is a ready market for gas in Ireland as the country currently imports over half of its gas supplies from the UK, with its Kinsale Head field in decline. Seven Heads has the possibility of being the first new gas from Irish fields into the country. The UK-Irish interconnector that supplies the markets is owned and operated by Bord Gais Eireann, which is solely responsible for gas supply and distribution in Ireland. Gas currently only occupies around 20% of the country's energy market, compared with a market of around 40% in the UK. With new gas lines being installed in Ireland to serve previously unconnected customers, and the advanced plans for several gas-fired power generation plants, there is a good opportunity for the market for gas to grow.

UK offshore safety statistics unveiled

The UK Health & Safety Executive (HSE) has published its latest offshore statistics report containing provisional injury and incident figures for the year 1 April 1998 to 31 March 1999, plus confirmed data for 1997/98.

Provisional figures for 1998/99 show that a total of 314 injuries were reported to HSE, compared with 368 the previous year, with reductions in all three reporting categories (see table, incidence rates per 100,000 workers given in brackets). The number of reported dangerous occurrences (non-injury incidents), at 649, was the same as for 1997/98.

The Inland Revenue's annual population survey shows an increase of approximately 2,500 (to 25,500 from 23,000) in the offshore population for 1998/99 compared to the previous year.

The provisional major injury rate has decreased by about 14% and the 'over three-day' injury rate by 26%, according to Dr Allan Sefton, Head of HSE's Offshore Safety Division.

Category	1997/98	1998/99
Fatality	3 (13)	1 (3.9)
Major injuries	74 (321.7)	72 (286.3)
Over 3-day injuries	291 (1,265.2)	241 (945.1)

New Malampaya partner

Texaco has acquired a 45% stake in the Malampaya natural gas project offshore the Philippines Island of Palawan from Shell. Texaco is to contribute an agreed amount towards the remaining construction costs of the $2bn upstream project. Shell is to continue as operator.

Field reserves are put at over 3tn cf of gas and 120mn barrels of condensate. First gas is due by the end of 2001, with production expected to reach 360mn cf/d by 2002.

The project is to provide gas to three new gas turbine power plants on Luzon Island. Two of the plants are currently under construction and will generate 2,200 MW of electricity. Combined, the plants will provide 2,700 MW of power generation capacity for the Philippines.

Iranian deal for Shell

Shell is to redevelop the Soroosh and Nowrooz oil fields offshore Iran in a deal which the company is reported to believe will not be impacted by US sanctions against the country. Shell will not actually own any equity in the fields, but is to act as a contractor to the National Iranian Oil Company under a 'buy-back' agreement. The company will develop the fields and in return will be repaid to the value of the capital extended, plus a remuneration fee. Development cost for the project is put at $800mn.

Field reverses are estimated to be between 500mn and 550mn barrels of heavy crude oil. Full production levels are expected to reach 100,000 b/d at Soroosh and 90,000 b/d at Nowrooz. Early production from Soroosh is due in autumn 2001, with full production from both two years later.

In Brief

United Kingdom

***The UK's Oil and Gas Industry Task** Force (OGITF) is to be replaced in January 2000 with a new organisation – Pilot. Energy Minister, Helen Liddell will chair the new group.*

***Shell reported in early November that** development drilling on its Shearwater field in the North Sea had been completed 350 days ahead of schedule and £40mn under budget. The high temperature/high pressure gas condensate field is due onstream in June 2000.*

***Gaz de France is understood to have** acquired Arco's 17.5% stake in North Sea blocks 44/17 a and c, which include the undeveloped Errol and Mac Adam gas fields.*

Europe

***Statoil has cut the 54bn cm estimate** of recoverable gas reserves at the Kvitebjørn field in the North Sea by 20%.*

***Italian energy group Eni and Ina of** Croatia are reported have brought the Ivana A platform in the Adriatic Sea onstream. The addition of four satellite platforms is expected to boost output from 700,000 cm/d of gas to a peak production of 1.8bn cm/d in 2001. Field reserves are put at more than 8bn cm.*

***The Norwegian Government is understood** to have approved, in principle, Aker Maritime's bid to become an oil producer on the Norwegian continental shelf.*

North America

***TotalFina is understood to have signed** an agreement under which it will participate in the further development of Gulf Canada's Surmont oil sands and Kerrobert heavy oil projects in Canada.*

***Houston Exploration is reported to** have acquired a 64% interest in the West Cameron 587 gas field in the Gulf of Mexico for $21mn. The field, which has reserves put at 21bn cf equivalent, is due onstream in 2000.*

***The Sable gas pipeline project is** expected to be delayed beyond its planned mid-November start-up date until a native rights dispute with the local Indian community is settled.*

NEWS Upstream

UK oil and gas output on course for record year

Oil production reached its highest September level since 1985, despite a small fall in output during the month while gas production reached its highest ever level for the month, according to the most recent Royal Bank of Scotland *Oil and Gas Index*.

In the 12 months to September, oil output averaged 2.62mn b/d, an increase of 3.1% compared with the same period a year earlier. The fall over the month to 2.59mn b/d, just 2.1% down on August, was not significant, states the Bank.

Gas output increased by 11.4% to 7,356mn cf/d, after a small fall in August. Output was up by 15% compared with September 1998.

'This year remains on course to record the highest ever level of oil and gas production,' commented Stephen Boyle, Head of Business Economics. 'Even allowing for the fall in oil production, combined output rose by 2% on the month.'

Brent averaged $22.83 during September, its highest level for 32 months, although prices varied between $20.70 and $23.54 during October. Commenting on prices, Boyle said: 'The variation in prices in October was just the markets responding to rumours about stock levels and the extent of compliance to agreed production cuts. However, compliance rates are still high, stocks are below last year's level and with winter coming, prices look certain to remain around the $20/b mark over the next few months.'

Year Month	Oil production (av. b/d)	Gas production (av. mn cf/d)	Av. oil price ($/b)
Sep 1998	2,573,882	6,394	13.28
Oct	2,600,813	8,832	12.60
Nov	2,612,843	10,738	11.07
Dec	2,715,056	11,123	9.81
Jan 1999	2,664,121	11,532	11.16
Feb	2,678,138	11,532	10.20
Mar	2,679,786	11,107	12.54
Apr	2,717,767	9,863	15.66
May	2,507,093	7,349	15.18
Jun	2,400,277	6,785	15.91
Jul	2,602,363	6,816	18.90
Aug	2,645,910	6,576	19.93
Sep	2,590,535	7,356	22.83

Source: The Royal Bank of Scotland Oil and Gas Index

North Sea oil and gas production

Shell invests in Nigeria

Shell has given the go-ahead for the EA oil and gas field development, the second tranche of its $8.5bn integrated oil and gas investment programme announced earlier this year. Around $1bn is to be spend on the field which is located 90 km southwest of Warri in the shallow water offshore the Niger Delta. Field reserves are put at 350mn barrels of oil. First oil is expected in 2H2002. Once fully developed, the project will produce 120,000 b/d of oil and supply up to 100mn cf/d of gas.

The first tranche of the $8.5bn investment programme was for $1.8bn to expand capacity at the Nigeria Liquefied Gas plant with a third processing train and related infrastructure.

Ekofisk disposal plan

Phillips Petroleum has put forward a proposal to the Norwegian authorities for the $1.14bn decommissioning and disposal of 15 oil and gas structures in the North Sea Ekofisk field.

The company plans to bring ashore the topsides of all 15 installations for recycling. Ekofisk's concrete oil storage and processing tank and surrounding concrete barrier, together with 149 miles of trenched pipelines and drill cuttings, will be left in place.

If formal approval is given, it is planned to remove the installations between 2003 and 2018, with the Norwegian Government funding two-thirds of the costs.

In Brief

***Initial drilling results at Canadian company** Husky Oil's North White Rose field offshore Newfoundland are reported to indicate potential recoverable reserves of 2,000bn cf of gas. More advanced drilling at the company's South White Rose field are also said to have indicated recoverable oil reserves in the region of 250mn barrels.*

***British-Borneo is understood to have** brought the Gulf of Mexico Allegheny field onstream. The field is currently producing 14,700 b/d of oil and 22mn cf/d of gas. The company is also reported to have made a new discovery – Medusa – in the same region.*

Middle East

***Iran is to give foreign oil companies** the opportunity to become involved in the development of the recently discovered Azadegan field in the southwest Khuzestan province.*

***The Dolphin gas project has been** chosen as the exclusive supplier of gas to meet all the requirements of Abu Dhabi Water and Electricity Authority, except in the Western Region, and is also to supply the gas which Abu Dhabi National Oil Company contracts to provide to Dubai.*

***BG International has acquired a 50%** interest in offshore drilling rights in five Israeli exploration licences in the Mediterranean Sea, owned by a consortium led by Isramco of Israel. BG is to pay $10mn for the stake.*

Russia & Central Asia

***The Russian Ministry of Fuel and** Energy has announced that all crude oil produced from wells which were previously shut in will be exempt from both excise duty and the federal share of royalties. It is understood that if all 36,000 of Russia's currently idle wells were brought onstream, production would be boosted by 15% (1mn b/d).*

***Shell (operator, 60%) and Veba (40%)** have brought the Saigak field in Kazakhstan's Temir block onstream. Oil will initially be produced from the Saigak-2 well for about three months in order to appraise the reserves and determine reservoir characteristics.*

***The Kazakh government is reported to** have decided against selling off a large part of its 25% stake in the Tengiz oil*

Azeri gas targets Turkish market

Just as plans of the Blue Stream and TransCaspian consortia appear to be gaining momentum, a new prospective supplier has entered the fray, comments Wood Mackenzie, in its latest *Caucasus Upstream Report*. The discovery of major new gas reserves (14–24tn cf) in the Shah Deniz structure has pushed Azeri gas into the crowded competition for the future Turkish market.

There is little doubt that Shah Deniz is a world-class gas field. With only a single well on the structure, the reserves estimates are, however, subject to substantial uncertainty (both on the upside and downside). Under the most optimistic scenario it would be possible to bring the field onstream in 2005, and it could ultimately support production levels of up to 15bn cm/y.

In the report, the Edinburgh-consultancy assesses the fundamental cost base of the various gas reserves vying for a share of this lucrative market. Azeri gas is potentially the cheapest new supply to the Turkish border. While prospective unit production costs in Shah Deniz are up to three times higher than the competing supplies, this is more than offset by the lower estimated cost of transportation. This cost comparison excludes national taxes, prospective transit country tariffs and interest payments. National taxes and tariffs are, at least in part, discretionary and are likely to be levied according to the strategic priorities of the respective producing and transit states.

While production costs for the Shah Deniz field are relatively high, other Azeri gas (for example, gas from the Azeri Chirag fields) is lower cost and could further improve the competitive position. Uncertainty must remain whether the upgrade of existing pipelines is a practical option consistent with the estimated cost.

In the short term, the main competition is from Iranian gas imports to Turkey. Iranian gas is likely to be the first new piped gas to the market. It is therefore well positioned to compete with, and potentially exclude, other gas supplies, especially if the market growth proves to be slower than predicted by Botas. The Turkish market is also very important to Gazprom, both from the perspective of a major market but also as a potential threat – a transport corridor which could eventually bring competing gas supplies into their key Central European markets. The implementation of Blue Stream could simultaneously consolidate Gazprom's wholly dominant position in supplying gas to Turkey and inhibit future competition in Europe.

Any consequent delays in the plans for supplying Turkmen or Azeri gas to Turkey is likely to be to the benefit of the Blue Stream consortium, comments Wood Mackenzie. Already slightly more advanced than the TransCaspian project, Blue Stream could progress if the Caspian suppliers prevaricate. It would appear that the prospective Azeri gas suppliers have a limited period in which to turn their plans into reality before the opportunity is diminished or gone.

For more information, or copies of the report, contact Emma Brayshaw on Tel: +44 (0)131 243 4237.

Licensing first in Gaza

BG International has signed a deal with the Palestine National Authority (PNA) for exploration offshore Gaza. The exploration licence, understood to be the first ever to be awarded by PNA, will be conducted in three phases. Seismic data will be acquired in phase one, and offshore exploration drilling undertaken as soon as technically feasible. At least two exploration wells are planned to be drilled in the first 18 months. The subsequent phases will see an offshore development plan implemented and gas (if found) brought ashore to local markets.

If exploration and market development is successful, BG International and partner Consolidated Contractors Company (CCC) may invest up to $500mn in establishing Palestine's gas industry by conducting exploration, field development and building gas pipeline infrastructure.

White Nights output up

Croatian oil company INA reports that between July and October this year, it more than doubled output from its White Nights operation in Russia from 1,150 t/d to 2,250 t/d, while reducing operating costs by 65% from $20/b to $7/b. The introduction of hydraulic fracturing and electrical submersible pumps helped achieve the production increase, states the company.

Output is targeted to reach 3,300 t/d by the end of the year with further production rises in 2000.

Proved and probable oil reserves, as audited and reported by Baker Atlas in 1999, are 11.86mn tonnes. However, recoverable reserves in the licensed area are estimated by the State Reserves Committee of the Russian Federation at 62mn tonnes. (It should be noted that only half of the licensed area has been explored, and future reserve estimates will probably increase.)

In Brief

field. It is understood that only 5% may now be put on offer.

***The Sakhalin-1 oil and gas consortium** are understood to have agreed on a $50mn programme of activities for 2000, including $19mn for the Chaivo-19 well.*

***Chevron has reported that the Caspian** Pipeline Consortium shareholders have approved a $1.3mn budget for the year 2000. The 900-mile pipeline will carry crude oil from the Tengiz field in western Kazakhstan to the Black Sea port of Novorrosiysk. Due to be commissioned in 2001, the pipeline will initially carry 560,000 b/d, rising to 1.5mn b/d following upgrades.*

***Poland and Azeri state oil company** Socar are understood to have signed a Memorandum of Understanding covering the rehabilitation of the Buzavny, Mashtagah, Kala and Turkyan fields located north of Baku which are estimated to hold between 17mn and 20mn tonnes of remaining reserves.*

***Norwegian oil company Statoil does** not plan to resume its activities in Russia under current economic climate, reports the United Financial Group's* Russia Morning Comment.

***The Russian Duma has given its final** approval for the Northern Territories PSA which covers four fields with reserves of over 1bn barrels of oil being developed by Lukoil (60%) and Conoco (40%), according to the United Financial Group's* Russia Morning Comment.

Asia-Pacific

***Phillips Petroleum has announced a** fourth successful well on block 11/05 in China's Bohai Bay. The PL 19-3-5 well – which flowed 505 b/d of oil with a gas-to-oil ratio of 112 cf/b during its second well test under naturally flowing conditions – is likely to increase the 400mn barrel reserves estimate.*

***Conoco's North Belut-3 well in Natuna** Block B, offshore Indonesia, is reported to have tested at 2,480 b/d of oil and 38mn cf/d of gas.*

***India's state-owned Oil and Natural** Gas Corporation (ONGC) is understood to be planning to invest up to $1.5bn to rejuvenate the Bombay High fields in the Arabian Sea and boost resources recovery from 26% to 40%.*

NEWS Upstream

Offshore passports for North Sea workers

New offshore industry 'passports' are to be issued to every UK offshore worker as part of the drive to improve North Sea safety by 50% under the Step Change in Safety initiative.

The Vantage passport scheme's central database – administered by OPITO (the UK's Offshore Petroleum Industry Training Organisation) – will track trip histories, competency and training. Each individual worker will be issued with a smart-card linked to existing operating personnel tracking systems.

Initially, Vantage will provide a source of data on survival training, medical check-ups and trip history. The system will then be further developed to hold data on skills competency. In addition, the system will act as a source of information for operating companies to check that all the requirements to travel offshore have been met.

Letters have been sent out to a cross-section of industry to identify an IT nominee for each company across a representative range of operators, contractors and service suppliers.

The nominees will be invited to a number of briefings to ensure that those departments most likely to be involved in adapting their systems to interface with Vantage (IT and human resources) are fully appraised of the system and its implications.

The system will be piloted in two companies – currently expected to be Enterprise Oil and Wood Group Engineering – in late 1999/early 2000.

New LIFT for trading UKCS petroleum licences

A new website aimed at making it simpler for oil and gas companies to market and trade petroleum assets in the UKCS has been unveiled by the UK Offshore Operators Association (UKOOA) and the UK Department of Trade and Industry. The UK LIFT (Licence Information for Trading) site links traders and sellers to buyers. It gives users complete control over their asset portfolios and provides functionality that allows asset opportunity bulletins to be created and promoted online.

Schlumberger Geoquest is responsible for the design, building and support of the LIFT website which can be found at **www.uklift.co.uk** Site users will be able to submit licence information online, or simply click a map of the North Sea (or any other region in the UKCS) to find out what is available. Users pay a monthly fee of £250 to advertise blocks on the website. Retrieval of information is free.

A total of 89 oil and gas companies are reported to have registered to use the website which already lists 43 blocks for sale. It is hoped that up to 450 transactions will take place on the site in 2000.

UK Government hit by Greenpeace court case

The UK Government has been defeated in a landmark legal ruling which protects coral reefs, whales and dolphins in the UK's northeast Atlantic region. Mr Justice Kay ruled, in November, that all future offshore oil licensing is illegal until the Government properly applies the EU Habitats Directive. The judge indicated that environmental group Greenpeace's case that whales and dolphins can be harmed by oil industry activity was 'substantially uncontradicted' by Government and oil industry evidence, and that oil exploration was 'at least likely' to have an 'adverse effect' on deepwater coral reefs. He said that the Government had 'clearly' not applied the Habitats Directive in initiating the next round of oil licensing in the northeast Atlantic. The case centred on the UK Government's decision to limit the application of the EU Directive to only 12 miles from the coast rather than the 200 miles in which it licenses for oil.

The Government has decided not to appeal against the decision. Work to fully apply the Directive to existing UK legislation is expected to delay the next UK offshore licensing round until March 2000.

First production from Jotun field

The Jotun field in blocks 25/8 and 25/7 of the Norwegian North Sea has come onstream. The field is being developed via an FPSO tied back to a wellhead platform with dedicated drilling facilities, with crude export via shuttle tanker. The initial production of 25,000 b/d is expected to reach a plateau rate of 100,000 b/d in early 2000. Field reserves are put at 210mn boe.

Project partners are: Enterprise Oil Norge (45%), Esso (operator; 45%), Norske Conoco (3.75%), Amerada Hess (1.25%) and Statoil (5%).

In Brief

***Triton Oil and Petronas Carigali** are understood to have signed a $5bn agreement to supply 390mn cf/d of gas from the Cakerawala field – located in block A-18 in the Malaysia–Thailand Development Area in the Gulf of Thailand – to the Petroleum Authority of Thailand and Malaysian national oil and gas company Petronas over the next 20 years. Block reserves are put at 10tn cf of natural gas equivalent.*

***Unocal and Mobil are understood to** have been given permission by state oil company Pertamina to begin initial deepwater development operations on the Makassar Strait offshore Kalimantan. First production from the West Seno and Merah Besar oil and gas fields is expected in 2002.*

***Santa Fe Snyder is reported to be** planning to bring the Ursa discovery in block 15/24 in the China Sea onstream in mid-2002. The project, which is likely to be developed via an FPSO and fixed platform, has recoverable reserves of between 40mn and 70mn barrels of oil.*

Latin America

***Lasmo reports that the LM-226E** (Tortola-1) exploration well in the southeastern part of the Dacion Contract Area of Venezuela has so far tested at 3,600 b/d of 22–25° API oil and confirmed the 100mn barrel risked reserve exploration potential of the Dacion area.*

Africa

***Shell Petroleum Development Co of** Nigeria is to go ahead with a planned $1bn investment in its 35 year-old oil/gas project 90 km southwest of Warri in Delta State. Discovered in 1965, the complex geology has delayed exploitation of the 350m barrels of oil reserves until new technology developed.*

***Development of Chevron's North** Nebma oil field offshore Angola is likely to be delayed following the sinking of the $175mn production platform en-route from South Korea.*

***Shell and Elf Aquitaine are reported** to be pulling out of a $3bn oil production and pipeline project in Chad. The two companies held a 60% stake in the project which was to develop 300 wells near Doba.*

NEWS Industry

Strong E&P growth from Surgutneftegaz

Surgutneftegaz has shown the strongest production growth in the Russian E&P sector according to its recently published 3Q1999 operating results (see table) due to its consistently high and ongoing investments in drilling, reports the United Financial Group's *Russia Morning Comment*. Provided that the company keeps production at the 3Q1999 level of 9.61mn tonnes, it will produce 37.45mn tonnes in 1999, up 6.5% from 35.17mn tonnes produced in 1998.

	3Q1998	3Q1999	Change	% change
Oil production (mn tonnes)	26.18	27.84	1.66	6.3
Gas production (bn cm)	7.59	8.18	0.58	7.7
Drilling (,000 metres)	1,394	1,518	124	8.9
– development drilling	1,265	1,384	119	9.4
– exploration drilling	129	134	5	3.7
Refining (mn tonnes)	11.43	13.10	1.67	14.6

Source: Surgutneftegaz, Russia Morning Comment

Surgutneftegaz' 3Q1999 operating results

Proposals for UK emissions trading scheme

Proposals for a UK-wide trading scheme for greenhouse gas emissions, starting in April 2001, have been put to the Government by business leaders. The trading scheme proposed by the Confederation of British Industry (CBI) and Advisory Committee on Business and the Environment (ACBE) Emissions Trading Group will be open to all companies operating in the UK and would run alongside the climate change levy, also due to be implemented in April 2001. A total of 25 leading UK companies has indicated that they are willing to support further development of the schem, so that it can start running from April 2001 and be well-placed to get involved in any future international programmes.

According to Peter Agar, CBI Deputy Director General, the scheme 'offers business a cost-effective way to cut greenhouse gas emissions... without threatening jobs or competitiveness'. Charles Nicholson, from BP Amoco and Chairman of the Emissions Trading Technical Committee said: 'The scheme will give business greater flexibility in meeting environmental targets and so encourage a wider range of firms to make binding emission reduction targets.'

Gazprom targets S.Europe

Gazprom's exports to Europe rose by almost 7% in the first nine months of 1999 compared with the same period in 1998, reports the United Financial Group's *Russia Morning Comment*. Germany recorded a strong growth of 11% as did France with 29%. The largest increase was in the Greek market, however, which more than doubled exports in the period. This supports Gazprom's view that it would be more profitable to target the countries of southern Europe rather than those of northern Europe where competition is more intense, says UFG.

US grant for Caspian

The US Trade and Development Agency (TDA) is to award a $425,000 grant to Azerbaijan to partially fund a natural gas master plan study. The study – which is to be undertaken by US energy company Enron – will determine the country's gas production potential, review its domestic market for gas, assess the need for gas processing facilities and evaluate the potential for exporting offshore gas from Azerbaijan through the TransCaspian gas pipeline.

The grant supports the US Government's Caspian pipeline policy, which aims to develop an East–West energy corridor for both natural gas and oil. Central to this policy are the TransCaspian gas pipeline project and the Baku–Ceyhan oil pipeline. Working with US companies, TDA is also providing technical assistance in this vital sector to Georgia, Turkey and Turkmenistan.

In addition to the TDA funding, Enron is to contribute $325,000 in resources and expertise.

In Brief

United Kingdom

***UK independent British-Borneo** is reported to be in negotiations which could lead to an agreed takeover.*

***BP Amoco reports that the group's** 3Q1999 replacement cost profit has increased by 72% to £1,955mn from the same period last year, reflecting a 'higher oil price and underlying performance improvements'. Return on average capital was up six points on a year ago, and four points on the previous quarter. Against the 3Q1998, performance, improvements contributed in the region of $400mn, reflecting higher volumes and lower cash cost. The original BP Amoco merger prize of $2bnly before tax was fully achieved.*

***Shell reports that its 3Q1999 net** income is up 165%, at $2,378mn, while its adjusted current cost of supplies earnings have increased by 115% to $1,808mn. Chairman, Mark Moody-Stuart warned staff against complacency, however, stating that while the results showed a 'continuing trend of improvement', the company still had 'a long way to go'.*

Europe

***Statoil is reported to have outlined** plans to borrow NKr50bn ($6.3bn) in order to acquire SDFI – the Statoil-managed company through which Norway holds most of its offshore oil assets – and create what is said to be the world's fourth largest listed oil group. The buyout is understood to have been prompted by proposals to privatise Statoil by 2001.*

***US communications and energy company** Williams Cos is reported to be buying a 33% stake in Lithuania's national oil company Mazeiku Nafta for $150mn.*

***Greece is understood to be planning a** second flotation of Hellenic Petroleum combined with a rights issue to raise $635mn. The second float will reduce the Greek Government's 75% stake to 51%.*

North America

***Repsol-YPF is to sell BP Amoco part of** its 59% stake in Crescendo Resources which produces natural gas in Texas. BP Amoco holds 41% of the company.*

NEWS Industry

Lessons learnt from Longford explosion

The Royal Commission recently published its report into the explosion and fires at the Longford gas plant in Victoria, Australia, on 25 September 1998. It recommends that a 'safety case' approach should be adopted for all potentially hazardous facilities within the State, writes *Jeff Crook*.

The accident at the Esso Australia-operated plant resulted in the loss of gas supply to 1.4mn domestic and industrial customers in the State of Victoria and severe business disruption. Crude oil production from the Bass Strait was also shut-down as a result.

Shortly after the accident, a call went out from VENCorp, operator of the Victoria gas transmission system, for all customers to shut off their gas supplies. Some 4,000 workers then went about the task of disconnecting customers. Supplies continued for some high priority users, such as hospitals, thanks to an interconnector pipeline from New South Wales. This increased supplies by the end of the first week after the accident, allowing many elderly and infirm people to be reconnected to the system.

The damage caused by the accident was severe because the fires were fed from inventory from other areas of the site. The emergency repairs involved isolating gas plant 1, the centre of the accident, from the other two gas plants. Gas was flowing again from gas plants 2 and 3 by 4 October, nine days after the incident. There then followed the huge task of reconnecting customers and relighting gas appliances.

Further work was necessary to restore Longford's full gas production capacity to meet Victoria's winter needs, and to enable crude production to return to normal. The scope of the work included repairing damaged instrumentation and piping. It was not until mid-January 1999 that that crude oil production from the Bass Strait reached a level of 200,000 b/d, close to the 230,000 b/d achieved before the incident.

Sir Daryl Dawson, AC KBE CB, chaired the Royal Commission, which inquired into the accident. The specific cause of the accident was attributed to the rupture of a heat-exchange vessel following a process upset, which began with the tripping of hot oil pumps. The loss of hot oil supply allowed some vessels to be chilled by cold oil whose temperature was around –48°C. When the hot oil was re-introduced, one of these vessels suffered a brittle fracture.

The report criticises the training of the operators and supervisors at the gas plant. It notes that the risks of the loss of hot oil supply might have been better understood if a hazard and operability (hazop) study had been performed. The central recommendation of the report is that a safety case should be produced for hazardous plants onshore. A new government authority needs to be established to administer the safety case procedure.

The safety case regime advocated by the Royal Commission would be similar in principle to that which covers offshore facilities in Australian waters (and most onshore and offshore plant in Europe). The offshore safety case regime was introduced to Australian waters shortly after the Cullen inquiry into the Piper Alpha disaster in the UK. It was due to be reviewed in 1998, but the review was delayed so that the lessons of Longford could be taken into account. The review process finally got underway in July 1999 and is due to be completed by 30 June 2000.

When announcing the offshore safety review, Minister for Industry, Science and Resources, Senator Nick Minchin said: 'I believe the safety case concept is at the leading edge of the safety management of hazardous facilities. This makes it all the more important to ensure, by means of a full review, that safety cases are being administered as effectively and efficiently as possible in Commonwealth waters.'

Shell assesses future of Australian refineries

Shell Australia is embarking on a detailed study into the company's existing and future manufacturing and supply arrangements in the New South Wales market. Company Chairman, Peter Duncan, said: 'It is well known Australia's refining industry is under considerable pressure. It continues to face low profitability and requires significant restructuring and investment in the near term to better position it to compete with imports from Asia.

In addition, there is a future requirement to significantly upgrade Shell's Clyde refinery to meet proposed new lower emission fuel standards to be phased in between 2003 and 2007. This is estimated to cost Shell hundreds of millions of dollars in capital works, and this combined with sustained poor returns from our manufacturing business causes us to further examine every possibility.' He concluded by saying that: 'On the present industry outlook, it is difficult to see a future for our Clyde refinery beyond 2006.'

The future of Shell's Gore Bay terminal in Greenwich and Parramatta terminal will also form part of the study, due to be completed in March 2000.

In Brief

BP Amoco has signed a $1.1bn contract *to outsource its US accounting and back-office operations to accountant and consultant PriceWaterhouseCoopers. The 10-year contract covers BP Amoco's offices in Oklahoma, Texas and Illinois.*

BP Amoco and Arco have announced a *provisional agreement with the Alaskan State Governor on a package of asset disposals and other measures designed to secure Alaskan government acceptance for the proposed merger of the two companies. Subject to merger completion, BP Amoco will sell 175,000 b/d of production, together with associated infrastructure, 620,000 acres of state and federal exploration leases and matching stakes in the Trans-Alaska pipeline system.*

Russia & Central Asia

Reforma Investments of Cyprus is *understood to have acquired a 9% stake in Lukoil for $200mn as part of the partial-privatisation programme of the Russian oil company.*

Enterprise Oil is reported to have *acquired a 7.5% stake in Khanty Mansiysk Oil, an independent Russian exploration and production company with assets in West Siberia, for $20mn.*

Asia-Pacific

Woodside Petroleum is reported to *have increased its stake in Oil Search – which has a number of exploration interests in Papua New Guinea (PNG) and is involved in the PNG–Queensland, Australia, pipeline project – to 14.3% at a cost of A$25mn.*

Latin America

Petrobras of Brazil is reported to have *unveiled a $32.9bn investment plan for 2000–2005, after which the company plans to be a self-sufficient crude oil producer.*

Africa

BG International has received preliminary *approval from the Egyptian Investment Authority for a plan to set up a company for exporting LNG. BG will hold a 75% stake in Egypt LNG, local company Orascom Construction Industries holding the remaining 25%.*

SIGGTO looks to the future

The Society of International Gas Tanker & Terminal Operators (SIGTTO) celebrated its 20th anniversary in October – at a time of unprecedented activity not only in the liquefied gas shipping trades, with new markets opening up, major new players entering the arena and new forms of operation, but also in the organisation's own work programme.

Membership comprises 108 companies which collectively represent 95% of the world trade in LNG and over 50% of the global LPG business, states Gerard Loiseau, SIGTTO President. Both trades are forecast to grow significantly over the next 20 years, driven by growing concern for the environment and the clean-burning characteristics of these fuels. Industry experts predict that the global trade in LPG will grow from its present level of 50mn tonnes in 1999 to at least 80mn tonnes in 2020. In 1998 the world trade in LNG reached 83mn tonnes. Estimates for world LNG trade in 2020 vary widely, but generally fall into the 160mn–210mn tonnes range of which some 33mn is expected to be shipped to India and China – two countries which do not, as yet, import LNG.

According to SIGTTO General Manager John Gyles, it is 'essential' that the public has confidence in the safe transport and handling of liquefied gases and he believes that the organisation's challenge during this 20-year growth period will be to 'sustain high standards for a larger and broader membership in the face of changing technologies and risks'.

SIGTTO produces a steady flow of information notes, recommendations and guidance on best practices for industry members. The most recent of these is *Liquefied Gas Safety – A Guide for Self Assessment,* which is available in electronic-only format. (Earlier this year, the organisation unveiled its first ever document to be solely published on CD – entitled *Guide to Passage Planning for the Singapore and Malacca Straits.*)

Captain Marc Hopkins, SIGTTO Technical Advisor, points out that the new guide marks an important breakthrough in the style of its publications in that users are able to 'navigate' the contents and the references through internal links, insert customised notes, and tailor the document for use in specific situations. It will also automatically generate graphical depictions of assessment criteria as the auditor records them in the document. The guide is currently available to all SIGTTO members. The Board has yet to decide if it will be offered for sale outside the organisation.

Banking on Q8 service stations in the UK

Kuwait Petroleum (UK) has unveiled a six-month pilot scheme with the Bank of Scotland under which cashpoints are to be installed on five Q8 forecourts in Peterborough, Brighton, Norwich, Downfield and Cambridge. If successful, a number of other sites have already been selected for further installations. 'In today's competitive market we need to be able to offer more than just petrol,' comments Peter Arscott, Manager Retail Planning. 'Like the addition of Xpress Budgens stores, a cashpoint makes the forecourt more multi-purpose and more of a destination.'

The Bank of Scotland is part of the Link network, and all the machines will currently accept any card without making a charge. No involvement will be required by Q8 staff – the cashpoints will be owned by the Bank of Scotland and serviced by a security company. 'It's just another example of how technology can benefit customers without making extra demands on staff,' says Arscott.

In Brief

United Kingdom

***Most of BG's liquefied natural gas** (LNG) storage capacity should be removed from BG Transco's price control and sold by auction to gas shippers, says UK gas industry watchdog Ofgem. It is hoped that such a move would establish a free market price for these facilities, which Director General of Gas and Electricity Supply, Callum McCarthy, believes will be lower than the regulated price.*

***The UK Pipeline Industries Guild is** inviting companies in the pipeline industry to enter for one of its pipeline technology awards which are made annually in recognition of significant contributions either to subsea or land-based pipeline engineering. Further details are available from Richard Glenister at the Guild. Tel: +44 (0)20 7235 7938; Fax: +44 (0)20 7235 0074; e:* Glenister@pipeguild.co.uk *The closing date for entries is 31 December 1999.*

***Sainsbury's is claiming to be the first** UK supermarket chain to open LPG refuelling points on its superstore service station forecourts. Its Beckton store in East London – which serves 24,000 customers per day – is the first to trial the Autogas fuel, soon to be followed by two further sites.*

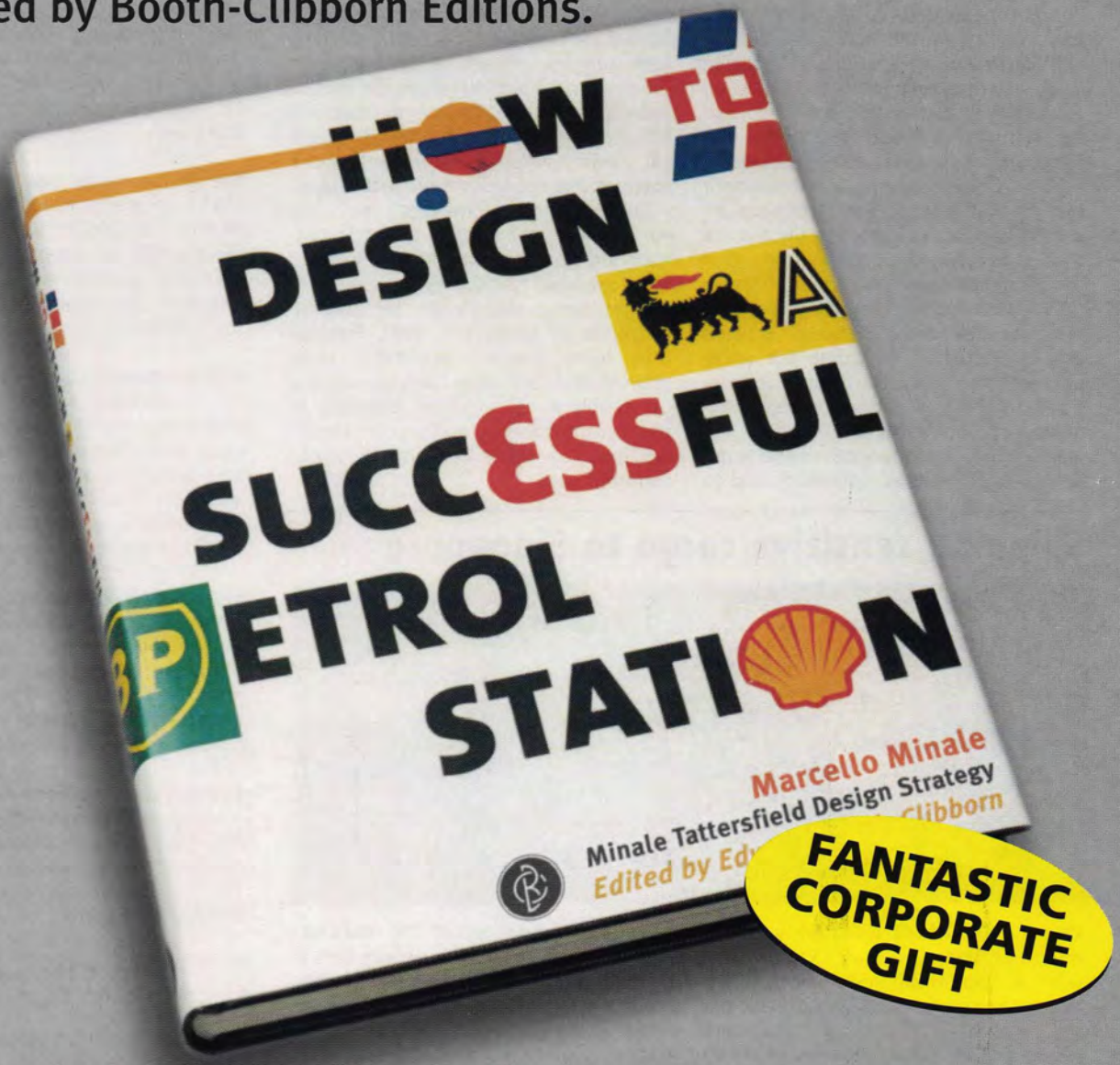
***UK Energy Minister Helen Liddell has** refused Burlington Resources (Irish Sea) permission to build a 560-MW combined cycle gas turbine power station at Rhosgoch, Anglesey. She also refused Kent Power permission to build a 1,200-MW combined cycle gas turbine power station on the Isle of Grain in Kent. Rolls-Royce Power Ventures' proposed 49-MW gas-fired combined heat and power station at Ansty, near Coventry was given the green light while a proposal for a new 450 MW gas-fired power station at Raventhorpe, Scunthorpe, North Lincolnshire was rejected.*

***The UK Freight Transport Association** (FTA) has said that the UK Chancellor of the Exchequer could relieve goods vehicles from the burden of the fuel duty escalator by implementing a simple VAT accounting process. FTA argues that if the Chancellor were to differentiate between private cars and goods vehicles then such a process should allow commercial, VAT registered companies to claim back VAT at a special rate, effectively providing a business rate for fuel costs borne by industry.*

How to design a successful petrol station

by Marcello Minale

Published by Booth-Clibborn Editions.



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We are now in the final stages of editorial selection. If you can contribute an interesting project, please send your material for consideration by the editorial panel.

Already contributing: Fitch, Grootvelt Architect, John Pawson, Minale Tattersfield & Partners, Odd Thorsen, Samyn & Associés, Wolff Olins.

Please send any contributions to Lucy Hughes, Minale Tattersfield & Partners, The Courtyard, 37 Sheen Road, Richmond Surrey, TW9 1AJ
Tel: 0181 948 7999 Fax: 0181 948 2435 Email: lucy@mintat.demon.co.uk

NEWS Downstream

EU tightens up on vehicle emissions

The European Union's oil industry is to be invited to another series of meetings with car manufacturers and EU officials in an attempt to tighten the screw on emissions still further and enable Europe to meet its commitments under the Kyoto Protocol, writes *Keith Nuthall*.

EU Environment Commissioner Margot Wallström told the latest conference of countries supporting the climate change agreement – held in Bonn – that the European Commission will publish a new Action Programme next year. It will promote discussions between Brussels and EU industries, including the transport sector, on how to further cut emissions and will also lead to the imposition of new anti-pollution regulations.

'We need strong incentives and regulations to individual consumers and to businesses... exploiting the enormous advantages offered by so many new technologies already available,' said Wallström. 'I have therefore decided to launch an Action Programme that will bring all stakeholders around the table to create synergies and will work towards a consensus on practical steps.'

Environment Ministers at the conference later agreed to settle outstanding details of the Kyoto Protocol by November 2000. Their aim is to trigger early ratification by enough countries to bring the 1997 Protocol into force. Earlier, Wallström complained that 'emissions have been going up steeply in recent years, especially in the transport sector,' adding that the EU was not 'on track' to fulfil its Kyoto commitments.

Shipping sensitive cargo to Singapore

Clipper Elite Carriers' (CEC) Arktis Mistral arrived at Singapore on 7 October 1999 with a 'high-technology' module for Singapore Syngas. According to CEC, the ship's two 90-tonne capacity cranes were required to lift the sensitively engineered cargo without causing any displacements of the configuration of the technical design arrangement. The vessel's hull is designed to achieve an optimum hydrodynamic behaviour capable of matching the target transit speed of 15 knots and good stability – making it particularly suitable for the carriage of this 'delicate' cargo.

Tackling bottom leaks from steel storage tanks

The prevention of leakage from storage tanks containing oil, chemical feedstocks or products is of primary importance for avoiding ground and groundwater pollution. National and local authorities are becoming increasingly environmentally conscious and various countries have introduced, or are introducing, statutory regulations aimed at minimising the risk of such pollution.

The EEMUA (Engineering Equipment and Materials Users Association) Storage Tanks Technical Committee, comprising specialists from major users of storage tanks, considered that there was a lack of guidance in this area and has developed a new document – *Guide for the Prevention of Bottom Leakage from Vertical, Cylindrical, Steel Storage Tanks* – to meet this need. The guide addresses the problem of leakage from vertical cylindrical tanks constructed of plain carbon steels, caused by loss of integrity. Such loss is almost always caused by deterioration of the tank bottom, which itself may be caused by corrosion or by deterioration of the foundation.

The document provides solutions for practical and economic leak detection and management systems. Coverage also includes causes of bottom leaks, inspection techniques, corrosion protection and repair methods. For more information on the document, priced £65 (excl. postage and packaging; 25% discount for EEMUA members), Tel: +44 (0)20 7628 7878, Fax: +44 (0)20 7628 7862.

In Brief

Europe

The Turkish Government is reported to *have announced plans to put up for auction 51% of service station operator Turk Petrol as part of a privatisation plan.*

The Dutch media has reported that *Shell's refinery in Rotterdam is to deliver 300,000 t/y of carbon dioxide (CO_2) at cost price to 1,500 horticultural producers in the region between The Hague and Rotterdam from 2001.*

Agip is reported to be selling 130 of its *service stations in the Marche and Molise regions of Italy to a new company, Petrolifera Adriatica, a joint venture between Goldengas and Milopart Investimentos. The deal will give the new entrant up to 10% of the fuel retail market in the two regions.*

Greece and Macedonia are understood *to have begun construction of a $90mn oil pipeline that will link refineries in the port of Thessaloniki in northern Greece to the Macedonian capital city of Skopje. The 220-km pipeline will carry 2.5mn t/y of oil.*

Exxon is understood to be merging its *refinery in Augusta, Sicily, with Agip Petroli's nearby facility at Priolo in a two-year project valued at $110mn. The combined plant will have a 240,000 b/d capacity.*

Russia & Central Asia

The 240,000 b/d Baltic pipeline is to be *commissioned in 1Q2000, with the first delivery to be made in 1H2000, according to the Minister of Fuel and Energy, Viktor Kalyuzhny. However, the United Financial Group's* Russia Morning Comment *believes this schedule to be 'overly optimistic' given that the project has so far managed to find only $55mn of the $500mn total cost, raised through a special $1.43/tonne oil export tariff. Surgutneftegaz is reported to have agreed to take a 20% stake in the project, worth $100mn.*

Asia-Pacific

Abu Dhabi's International Petroleum *Investment Company (IPIC) is reported to be acquiring a 50% stake in South Korean oil refiner Hyundai Oil Refinery for $510mn.*

NEWS Downstream

Tax changes in UK pre-Budget statement

UK Chancellor of the Exchequer, Gordon Brown, recently unveiled his pre-Budget statement. Key measures include the scrapping of the fuel price escalator system which automatically raised petrol and diesel prices by at least 6%/y in real terms.

Decisions on fuel prices will now be made on a 'budget by budget' basis, with any revenues raised by increases in road fuel duties above the rate of inflation to be put straight into a ring-fenced fund for the modernisation of roads and public transport.

It is reported that such a move could provide up to £1.8bn/y on top of the £5.5bn the government already invests in the UK's transport infrastructure – assuming cuts are not made elsewhere.

Environmental groups expressed concern at the scrapping of the fuel escalator, although they welcomed the Chancellor's restated commitment to cut greenhouse emissions.

Although the Chancellor has kept the Climate Change levy (due to be implemented in April 2000), despite protestations from industry, he has reduced the amount of money slated to be raised by the levy from £1.7bn/y to £1bn/y while increasing the amount of targeted carbon savings from 1.5mn t/y to 2mn t/y.

High energy users such as the chemical industry will be given 80% exemptions from the tax – provided they sign up to energy-efficiency agreements.

Monies raised by the tax are to be recycled back to industry through reduced national insurance contributions or energy efficiency grants.

Q8 expands International Diesel Service

Kuwait Petroleum (UK) has further expanded its International Diesel Service (IDS) with the opening of five new sites in East Anglia at a cost of £60,000. A total of 11 sites now provide comprehensive locate IDS cover in East Anglia.

The IDS service can accommodate all diesel fuelled vehicles, from company cars to large articulated lorries. Drivers refuel with diesel (and lubricants) using their IDS card with an individual PIN number, and their companies receive an itemised invoice every month. Lubricants are also covered by the scheme.

According to Q8, the latest expansion to the service marks a 'new departure for IDS', which until now has concentrated on the requirements of long distance drivers using the company's 600 sites on major trunk roads throughout the UK and Europe.

According to Dave Armstrong, IDS Manager, the investment will give the company 'a very strong network in this area, allowing us to attract companies with a local market in addition to those with national and international business'. If the East Anglian network proves successful, plans are to replicate the scheme in other parts of the UK.

In Brief

Africa

In South Africa, fuel prices were *adjusted with effect from 3 November by a 1% rise in the retail price for petrol and a 6.5% hike in the wholesale price for diesel. South African petroleum product sales showed 2.2% growth in 3Q1999 compared with the same quarter in 1998.*

The third export consignment of *Nigerian LNG Limited was supplied to Botas of Turkey on 31 October 1999. The first two cargoes went to Enel of Italy and Enagas of Spain.*

Chevron Nigeria is raising its crude handling *capacity by 45% (or 150,000 b/d) to 480,000 b/d following the commissioning of a new dehydration system as part of the Escravos terminal expansion project, writes* Stella Zenkovich.

Customs duties on oil and petroleum *products – including LPG and aviation kerosene – imported from the European Union into South Africa are to be 'periodically reviewed' with a view to reducing them, reports* Keith Nuthall. *This, in turn, would promote the 'further liberalisation of trade' under a trade and cooperation agreement signed by Government officials in Pretoria and Brussels.*

Spanish gas company Grupo *GasNatural is reported to be planning to invest $400mn on establishing three gas supply lines between Algeria and Spain to provide LNG to Morocco.*

UK Deliveries into Consumption (tonnes)

Products	†Sept 1998	*Sept 1999	†Jan–Sept 1998	*Jan–Sept 1999	% Change
Naphtha/LDF	150,313	261,454	2,111,895	2,400,171	14
ATF – Kerosene	822,921	902,261	6,782,820	7,211,057	6
Petrol	1,802,852	1,788,510	16,205,332	15,993,363	–1
of which unleaded	1,438,082	1,596,236	12,596,502	13,703,258	9
of which Super unleaded	33,863	34,302	310,399	270,237	–13
of which Premium unleaded	1,404,219	1,561,934	12,286,103	13,433,008	9
Lead Replacement Petrol (LRP)	–	–	–	13	–
Burning Oil	256,845	222,352	2,532,922	2,510,864	–1
Automotive Diesel	1,243,689	1,258,689	11,202,053	11,228,718	0
Gas/Diesel Oil	626,588	530,550	5,342,149	5,022,632	–6
Fuel Oil	172,678	127,474	2,064,719	1,520,672	–26
Lubricating Oil	65,434	62,586	619,978	585,409	–6
Other Products	764,312	617,096	6,128,997	6,252,040	2
Total above	5,905,632	5,770,972	52,990,865	52,724,926	–1
Refinery Consumption	505,383	491,772	4,852,548	4,653,075	–4
Total all products	6,411,015	6,262,744	57,843,413	57,378,001	–1

† Revised with adjustments *Preliminary

Getting down to business on the Net

E-commerce has become the latest buzzword in the oil patch. But can doing business on the Internet benefit the petroleum sector? *Gordon Cope* looks at the activities of some major companies in North America.

Business on the Internet is booming. Investment banking firm Goldman, Sachs & Co. recently reported that the $39bn in e-commerce conducted last year will almost triple to $114bn this year, and explode to $1.5tn by 2004.

The main reason for the projected growth in e-commerce is seductively simple: it purportedly saves money. General Electric (GE) recently announced that it had trimmed $1bn off its procurement by invoicing exclusively in the electronic domain.

Oil companies are taking note. BP Amoco Chairman John Browne has stated that he wants 50% electronic procurement by the end of 1999, and 95% by the end of 2000. Meanwhile, Scandinavian firm Statoil has gone over to SAP's comprehensive business-to-business hub (**www.mysap.com**) for its non-productive procurement needs.

But, as more than one wag has pointed out, you can't pump petrol with a PC. Are the benefits of e-business to oil companies real, and, if so, how do they achieve them?

Spinning the web

International Business Machines (**www.IBM.com**) is not only a major supplier of computer hardware, it is also one of the largest e-commerce consultancies in the world. 'IBM has done over 18,000 e-business engagements worldwide,' says Monty Carter, the company's Business-Unit Executive for Oil and Gas. 'We've led initiatives for about 30 large oil and gas integrated operations in North America.'

According to Carter, there are many different levels of immersion into the Internet, beginning with a simple information website. 'Most companies start small, with internal e-mail, then move to a static website, with information about products and employment opportunities.'

Many business-to-customer sectors, such as banking and retail, have advanced quickly into catalogue sales, where such virtual companies as Amazon.com offer a galaxy of books for sale. 'The primary goal of most (retail) websites is to grow revenue by building brand awareness and cutting costs,' says Carter.

But the emerging strength of the Internet is in the area of business-to-business. 'A lot of organisations are using e-business to create operational efficiency,' says Carter. According to the consultant, they look for ways to cut the cost of acquiring non-production items (pencils and paper, say) and production goods (compressors and pipe).

When a petroleum company decides to enter the Internet, IBM conducts a two-day, preliminary seminar in order to establish its needs and goals. In Carter's experience, the oil and gas industry primarily focuses attention on the midstream and downstream portions of the sector. Their interests fall into two mains areas – supply chain management and customer relationship management.

Supply chain management, also referred to as e-procurement, involves the coordination of a company's purchasing of goods and services. Generally, this entails whittling down suppliers to a core group, then negotiating savings in return for loyalty.

In order to make supply chain management work electronically, companies and suppliers establish extranets – secure, extended Net sites that allow partners to access each other's databases through electronic data interchange. 'Let's say you're building a natural gas plant, and you're looking for specific items,' says Carter. 'You can quickly establish costs, availability and timelines.'

Since IBM began to put e-procurement for its office equipment in place three years ago, it has saved an estimated $4bn. 'We'll have gone from six million invoices to nothing by the end of 1999,' says Janet Wood, General Manager for e-business solutions at IBM.

No major petroleum company has had a full, end-to-end e-procurement system running long enough to judge savings, but the partial evidence is heartening. 'Western Geophysical established web-based procurement and e-catalogues to generate purchase requisitions,' says Carter. 'It reduced costs from $100 to $10 per transaction, and saved $20mn annually in costs'.

The second area, customer relationship management, is also known as customer intimacy. 'The oil company asks: "Who are our customers, what are we selling to them, and what can we deliver,"' says Carter. 'Take the situation where you have an Imperial (Exxon) gas

station on one corner and Shell on the other. How do you shift customer focus from [their] price to [your] value?'

Several companies have loyalty programmes that allow retail customers to collect points, then redeem them for rewards listed at online catalogues. Other companies issue cardlock systems for the sale and tracking of bulk fuel at automatic stations. 'A US transportation company that is a major consumer of diesel and oil products secured a relationship with two suppliers,' says Carter. 'The arrangement allowed the oil companies to forecast their demand, and it allowed the transportation company to fix costs and delivery.'

The costs and time-frame for implementation of an e-commerce system vary, depending on the starting point, the sophistication of the system, and the task required. 'A simple e-commerce site can be installed within one month,' says Carter. 'It can take up to eight months for more comprehensive systems.' Costs, says the consultant, can run from $50,000 to $1mn.

Getting feet wet in the surf

While most oil companies contacted by *Petroleum Review* were coy to a fault regarding their intentions, a casual surf around the Internet reveals the majority have already established websites to address the basic requirements of information, communication and e-commerce.

The website of Mobil Oil, based in Fairfax, Virginia, (**www.mobil.com**), features information not only on its recent alliance with Exxon, but also petroleum products, consumer promotions, service station locations – and an extranet for suppliers.

Enron, based in Houston, Texas, has recently repositioned the corporation as a full-service energy company and bills itself as the world's largest marketer of electricity and natural gas. Its website (**www.enron.com**) features the Enron Intelligence Network, a supplier of multimedia applications that enhance e-commerce and communications.

Shell (**www.shell.com**) has a colourful website that, in addition to supplying information regarding employment, products and services, links the curious to over 150 international sites. 'Shell's e-business efforts are being coordinated worldwide from London and the Hague,' says Norm Badgley, E-commerce Coordinator for Shell Canada. 'But we're all looking at more value for our external website.'

Chevron (**www.chevron.com**), which is based in San Francisco, offers much the same information as its peers, and is more than happy to discuss its plans. 'We've been using electronic data exchange as part of our e-commerce programme for invoices and the payment side for the last four or five years,' says Cory Carlson, Team Leader for Financial Services. 'Right now, we're about 1½ years away from an e-procurement strategy.'

According to Carlson, the delay is not due to technical bugs. 'We have an SAP system that's very integrated. It takes many aspects and consolidates them into a single source of data input.'

Rather, trying to coordinate partners is the real challenge of e-procurement. 'We're heavily involved with our suppliers to get worldwide cataloguing.' Carlson notes that, once in place, it can be used equally well for both production and non-production requirements. 'Engineers, for instance, will have a searchable tool to find products and services.'

Curiously, for a sector that was first to embrace computers on the upstream side, there is a general feeling of foot-dragging when it comes to jumping into the Internet. 'They are lagging versus retail and banking,' admits IBM's Monty Carter.

Fingers invariably point to the sector's notorious love of confidentiality. 'Security is very key,' admits Carlson. 'But technology has come far enough that we're comfortable doing business electronically.'

Trying to place a dollar-and-cents value on e-commerce in the petroleum sector is difficult due to a lack of public information – IBM's oil and gas clients, for instance, have placed confidentiality restrictions on the consultancy.

The consultancy can quote a few rules-of-thumb, however. 'In general, companies can save 6% to 10% on general procurement,' says IBM's Janet Wood.

'For production equipment, savings aren't necessarily in purchases, but in having a better relation with suppliers and understanding their inventory,' says Carter.

'We've all heard about savings of 1% to 15%,' says Shells' Norm Badgley. 'It all depends on where your procurement process starts from.'

Spiders in the Web

There is a downside to the Internet; it allows non-governmental organisations and boycott advocates to erect their protest tents on a company's front e-lawn.

Exxon (**www.exxon.com**), which declined to be interviewed for this article, features a home page that divests information on investment, employment opportunities, consumer credit cards and chemical products. Of equal interest, however, are the dozen sites that turn up when one types in 'Exxon' in a search engine. A typical example is 'Survivors of the Exxon Valdez oil spill' (**www.exxonvaldez.org**), that graphically details the efforts of vistims of te 1989 Alaska oil spill to seek redress.

'They [protestors] are going to be there whether you choose to respond, or not,' says Carter. 'My observation is that you can use your website to be positive and proactive – it's one additional mechanism to reach out to customers and stakeholders.'

Other perils include 'disintermediation', or eliminating those intermediaries, such as product distributors, who stand between a manufacturer and its customers. 'A brand new company called e-chemicals (**www.e-chemicals.com**), started an online channel for distributing chemicals,' says Carter. 'It was formed by a bank and a freight company; they're offering 1,000 different products by the end of the year.'

The advantages of such virtual petrochemical companies are numerous – they have no expensive start-up costs for plants nor messy environmental laws to abide by. 'They have no history, so they have no workforce to upset or distributors to cut out of the loop,' says IBM's Janet Wood. 'They're a real danger to traditional companies.'

Those within the industry are wary of virtual companies, but look to counter the trend with their traditional strengths. 'We have looked at disintermediation, but the key is not eliminating value-added services,' says Chevron's Cory Carlson. 'We will continue to rely on our intermediaries (distributors).'

The outlook is com

Regardless of the perils, oil companies look forward to adapting the Internet to their needs. Recently, Shell Canada disposed of over C$700mn in conventional oil assets in the western Canadian sedimentary basin. 'We briefly considered the merits of using a virtual data room, but there were several obstacles,' says Morgan Yates, coordinator of the sale. 'It would have been costly and time-consuming, for instance, to convert all the data to digital form.'

And, unlike the old-fashioned data room, where visitors signed a confidentiality agreement at the door, no-one has yet to come up with a fool-proof way to ensure that valuable data doesn't go astray. 'Once it's out there on the Net, it's out there,' says Yates.

But, despite of the drawbacks, Shell is bullish over online disposition of assets. 'The advantage is that you give 24-hour access to even the most remote parties,' says Yates. 'This means broader exposure to a wider audience of potential bidders. And that benefits us, in the long run.'

Harnessing the Internet to control spares inventory

A typical refinery holds between $15mn and $20mn of spares inventory while a CCGT (combined cycle gas turbine) plant has an inventory of $6mn of spares. These inventories are expensive to hold and to manage. But sparesFinder.com is using the Internet to revolutionise the way in which these spares inventories are managed, explains company Director, *Jan Hutchings*.

While the Internet has been around for over 10 years, its benefit as a practical business tool is still in its infancy. However, it is a massive global library of information, some of which can be used for the benefit of business. It is also a valuable communications tool that is used to send electronic information, text, images and sound around the world quickly and cost effectively.

Being in its infancy, the real benefits of the Internet to business are only just beginning to take shape. At present, while there is a lot of 'hype' over how it will change our lives, there is little evidence of it doing so. The sceptics among us wait patiently for the revolution yet to come. But in the oil, gas and power industries at least, the wait appears to be over, first with the arrival of Internet energy trading, and now spares inventory management.

sparesFinder.com is a spares inventory service that harnesses the Internet to bring to oil and gas companies, power operators, generators and all those in the supply chain a real business benefit. The service is one of the first examples of how the Internet can facilitate a real business-to-business use. It delivers companies tangible results in terms of greater efficiency and lower operating costs. It's really what people in industry have been waiting for – it's just that until very recently, no one's really offered anything up.

Some idea of the potential savings from spares inventory management can be gained from a simple calculation. Take a multinational company with 100 sites which keeps $15mn in spares at each site. Suppose 20% of the spares are surplus to requirements – it's not uncommon – and the costs of storage are about 20% of the spares. Now, reduce the surplus spares by 1% each year and improve the optimal level of spares held by 2% per year. I reckon the company saves about $250mn over five years.

Not surprisingly, many of the world's leading oil companies have started to participate in the service, with sites uploading spares data from Shell, BP Amoco, Mobil and Texaco among others. The secret is e-visibility. If you can locate spare parts in a few minutes using the Internet, and call not just on the reserves of your own company's sites but also those of other operating companies who use much the same equipment, you can afford to hold fewer spares.

Pooling information

The original idea was first developed in New Zealand in 1997. The thinking throughout the development of this service was based on a simple fact: companies in large industrial and heavy engineering sectors such as power, and oil and gas, hold large spares inventories, much of which is surplus to needs and requires on-going servicing and storage at mounting cost.

The idea was straightforward. If inventories could be reduced by pooling inventory information internally across a multi-site company, and if surplus inventory data could be pooled externally on a regional or global basis, then there would be big savings to be made. Provided that the components required were available speedily and cost effectively from other contributors to the pool, participating companies could substantially reduce their inventory levels with all the associated cost benefits.

The problem was in deciding what form the service would take. It had to be readily available and easy to access by companies, good value, simple to use and update with details of an ever-changing inventory. Progressive technology and the Internet with its increasing accessibility and reach to every distant corner of the globe offered an excellent solution.

The **sparesFinder.com** service began piloting in the Southern Hemisphere in 1998. Its success within the power, oil, gas and other heavy industrial sectors where spares inventories ran into the millions, was almost instant. And this despite the fact that, even with the savings on offer, certain companies were slow to appreciate the real benefits the service offered.

However, within six months, it was in use by multi-nationals and both small-and medium-sized enterprises (SMEs) in industries in diverse areas such as mining, petrochemicals and manufacturing throughout the Australasian region. Twelve months down the line, Transalta Power, the first company to subscribe, has not only renewed its annual license, but has also recommended that the service be adopted across their 12-site New Zealand operation.

The service has been available throughout Europe since April this year and now several million parts sit on the **sparesFinder.com** database. The company has been introducing it across the UK oil and gas, chemicals and power industries since March 1999 and has solicited a lot of interest. In power, both CCGT units at Seabank Power, Avonmouth, and Fellside Heat and Power, Seascale, are already pooling data.

Selling surplus

The savings based on the use of the service where inventories run at high levels can be huge. Even with an average power operation, substantial capital can be released and operating savings made.

As an example, a typical CCGT power station has an inventory of approximately $6mn. If the plant is carrying 15% surplus (typical figures based on **sparesFinder.com** research, though many run at higher levels), this equates to a real figure of $900 000 tied-up in inventory which could be sold immediately without increasing risk to operational capability.

Additionally there is the cost of storage to consider. This normally runs at approximately 20%/y of the original purchase price, representing an annual cost of $180 000 – an extremely large negatively performing asset.

Generally, if operated correctly, the **sparesFinder.com** service should reduce a given plant's surplus by between 5% and 10%. However, for the

purposes of this illustration, if the plant's surplus is reduced by only 1%/y of total inventory, and minimum stock levels are reduced by 2%/y, a company with 10 such operating sites could save over £2mn/y ($3.2mn/y). In fact, in the real world, **sparesFinder.com** is already seeing examples where savings are potentially much higher and this does not include the cost of downtime, which in the power and energy industries can be massive. If nothing else, the **sparesFinder.com** service serves as an extremely cost effective insurance policy.

Specifically **sparesFinder.com** is being targeted to operators of, and suppliers to, gas and coal fired plants, nuclear power stations and any companies involved within the supply chain. Parts available for sourcing under the service include critical condensing, cooling and hydraulic components along with highly specialised equipment appropriate to individual sectors of the power industry.

The service is unique in that it allows individual end-users of spares to trade their excess inventory between each other – a horizontal supply chain. Also, because the service is delivered through the Internet, it provides all subscribers with a global choice of spares instantly and at the touch of a button.

Nick Phillips, the company's Business Development Manager for the power sector comments: 'Unlike the conventional method of sourcing spares through the vertical supply chain of spares manufacturers, distributors and a range of other middle organisations, **sparesFinder.com** works by releasing the potential of the horizontal supply chain – the surplus spares and equipment held by the users themselves.

'Our subscribers pool information about their surplus spares inventory, helping industrial sellers to release capital otherwise tied-up in spares and providing an instant global supply of cost-effective, immediately available, inventory. In the case of all areas of the power industry, its use can be expected to dramatically reduce on-site inventory resulting in major cost savings across the board.'

A 90-second search

Constantly changing stock levels are automatically uploaded to a live database directly from subscribers' inventory management systems. The business service, which is charged on an annual subscription basis, takes less than four hours to install, requires no further work once installed, and is simple to use and secure.

David Stroud, the company's Operations Director, explains: 'We provide software which gathers information on the spare parts inventory from all customer sites, and those of all other companies subscribing, and make it available at a central Infomix database. Software installation is easy, a Friday afternoon job. And it is highly compatible, sitting as comfortably alongside Enterprise Resources Planning systems as with the homespun inventory database of a single site.

'The cost of spares storage normally runs at approximately 20% of the original purchase price per annum.'

'Once installed, it takes no more than 90 seconds to find the part needed,' Stroud continues. 'You can choose to search just your company's own sites or all the sites on the database, which is a lot of potential sources not previously accessible. Then it's between you and whoever has the item required.'

Beyond that it's a case of negotiation between the supplying company and the purchasing one. Although, such companies are often in competition, it has not proved to be a problem. 'Companies are not competing at a spare parts level,' says Hutchings, 'and engineers have been slipping each other spare parts through the fence for years. We're simply extending their circle of friends.'

On a cost basis, the subscription charging of the service is proving to be a winner. 'We are differentiating ourselves from other Internet suppliers who are simply automating a vertical supply chain and taking a commission on all transactions,' says Hutchings. 'We have a horizontal supply chain, and our annual, flat fee approach is distinctive. We are building on existing practices, forming clubs – re-engineering with the Internet, if you like.'

'The service is totally unique in that it allows individual end-users of spares to trade their excess inventory between each other – a horizontal supply chain.'

Yet the returns can be massive. 'Keeping spares is expensive, and always a bone of contention between engineers and accountants,' he adds. 'There is continuous pressure from accountants to cut down. We bring liquidity to the spares stock. Indeed, an extra attraction of the system is that one company's out-of-date stock may be just what someone else is looking for. So instead of paying for a skip to take it away, you can sell it on.'

Additionally, multi-site companies can gain internal visibility (regardless of which inventory management system each site uses) to collectively reduce their stockholdings without increasing risk. This service is of particular interest to sectors with capital intensive spares and downtime criticality.

A worldwide network

In operating the mechanics of the virtual trading floor, **sparesFinder.com** is aggressively pursuing developments that will establish it as the provider of choice in these sectors, hence the relevance to the oil and gas industry. Business units are now being established across Europe and the US prior to an eventual world wide network; ensuring both effective distribution and first-rate customer service are in place. In addition, user groups are being offered to manufacturers and suppliers whereby end users gain real-time spares visibility – the timely location of a critical spare increases the availability of plant and reflects well on all concerned, including the OEM.

With the dawn of e-commerce upon us, **sparesFinder.com** is providing a genuine reason for businesses to embrace the Internet. This leading edge approach is creating a bow-wave of enthusiasm as the previously nebulous benefits of the new era are being crystallised. **sparesFinder.com** offers integration with most, if not all, inventory management systems and expects this to continue as procurement mechanisms become increasingly automated. But, as Stroud points out: 'A marketplace like this is not just about automatic data transfer. These spares are sitting on shelves in countless warehouses and, although unused, may need certain "ticks-in-the-box" before being passed on.

'While the parts and equipment listed for the heavy industry are unused and properly documented, the transaction process can be helped by third-party inspection and certification guarantees, and even a trusted clearing facility for funds as the deals are completed.' **sparesFinder.com** is now awaiting the call upon its services to help oil the wheels of the spares inventory market to bring efficiency gains not previously seen.

Energy traders harness the Internet

A recent independent survey conducted for Saladin – *Energy Trading Beyond 2000* – has revealed the overwhelming belief among energy traders that within the next few years, the majority of market price information will be obtained directly from the Internet.

According to Mark Powell, Product Manager for Saladin, the implications of Internet-based data acquisition will be enormous, both for the data providers and the consumers of this data. However, data providers will need to consider how to cost their data and protect it from copyright infringement, while users of this data will encounter additional management and data control issues.

Costing the Internet

Because of the extensive availability of free data on the Internet, the value of some information is perceived to be much lower than it would have been before the advent of the Internet. This is especially true where that information can be thought of as a by-product of another activity. In the energy markets, futures daily prices as well as power exchange prices are examples of charge-free data. This contrasts with specialised data providers whose whole business is the provision of value-added data, which in itself is the end product, positioned as a premium service and priced accordingly. This results in a polarisation of data into free data and value-added data.

Specialised data providers, that is providers of value-added data, face the challenge of how to licence and charge for this data within an Internet model. The Internet and associated digital technology will allow end users to have a much better view of their usage of data compared to the cost of that data. Many companies are already beginning to object to the current model of data licensing where whole combinations of data streams have to be purchased, regardless of the specific data streams required. Similarly they are seeing that individual data sets may only be used by a small number of the overall users of the data – say by a single office, desk or even a single analyst. The ability to monitor data usage at this level of granularity is leading to demands for a reform of the licensing structures.

Options for charging structures include: pay per view schemes where end users pay only for the individual data series they view, but pay each time they view the data. Other options include a retrospective accounting where companies are only charged for the data sets they access and the numbers of users who have actually viewed the data.

Copyright protection

From the data vendors' point of view the biggest concern is ensuring that end users are not breaking copyright on the data they use. If end users download a set of data from a website into Excel there is nothing to stop them from re-distributing that data to other parts of the organisation and even feeding the information into other systems such as a local archive or a trading or risk management system. This means that even though the data has only been accessed once and paid for once it is subsequently used many times by a number of people. For a review of copyright issues and the Internet, see Yong-Chan (1996).

In order to resolve these copyright issues, data vendors will need to adopt either a contractual or a technical solution. It is likely that data vendors will review their licensing contracts to adapt to the Internet model. Such revisions will need to balance the requirements of the data vendors and the end users.

In addition, it is likely that in the wider context of Internet copyright issues, technology will be developed to manage this aspect. Current technology such as XML (eXtensible Markup Language) allows data vendors to add copyright information to the data through meta information or tags attached to the data. This copyright information would then be carried along with the data even if it were copied into other applications. Given suitable monitoring software this would allow the usage and distribution of the information to be tracked and billed accordingly.

Ensuring quality of data

The final and most important issue facing consumers of data is the question of data quality. Many energy companies have invested large amounts of time and effort into organising and managing their market data. Many have even set up dedicated market data management groups. Most of these market data initiatives were driven by the recognition that accurate and reliable market data is essential for a large number of business areas. Consolidating the considerable efforts in acquiring, managing and quality checking market data leads to significant cost and performance improvements when compared to the previous situation where each department, desk or individual would each perform many of these related activities. Duplicating effort and inaccurate pricing lead to frequent instances of inconsistency between various groups.

Ensuring the quality of data acquired at little or no cost from the Internet will be a significant challenge. End users will have restricted opportunity to take these data providers to task for inaccurate or late data when they do not pay for the service. This means that data quality is likely to be one of the primary value-added services that will differentiate free services from premium services. A further differentiator will be the level of customer service that the vendor provides to end users in dealing with quality and other issues.

It is likely that this will result in the polarisation of data discussed above being reflected in trading organisations. The majority of energy companies will continue to maintain a local repository of market data that is of known quality. This quality checked data will be used for the majority of mid- and back-office functions. It will also be used in the front office for a number of tasks that are quality rather than time critical. In addition to this, the front office is likely to make use of a much wider range of information for analysis and decision support that may indeed be sourced for free from the Internet.

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E-commerce challenges for accountants and taxmen

Petroleum Review asked _John Butters_, a partner with Ernst &Young, about the likely impact of a significant move to Internet procurement and trading by the oil and gas industry. Butters started by explaining that his speciality was information security and controls and that his immediate background was in information systems auditing.

According to Butters, the general view, among the auditors and accountants was that the use of the Internet or extranets was, although they increased speed and flexibility, they do not fundamentally change the situation in terms of the monitoring, auditing and presentation of company accounts. The validity of electronic rather than written records has already been widely accepted. EDI (electronic data interchange) has already been established and accepted by the taxation and auditing authorities for some years and the general view is that internet transaction only extends the scope of EDI rather than introducing any fundamentally new principles.

The one area that Butters felt was most likely to present difficulties was taxation. His view was that the widespread use of electronic procurement and transactions would mean that 'fraudulent behaviour becomes easier' and he went on to suggest that for the tax authorities, policing electronic trade would be a 'nightmare'.

In terms of accounting and auditing, EDI was already accepted and its use successfully managed. However, until the present time, companies had kept their accounts on a single computer or a limited number of readily identifiable computers. Auditors and the tax authorities had the ability to physically identify where and on which computer the accounts data was stored.

The use of the Internet or extranets 'poses some challenges' as it means that some or all of a company's accounts processing can be distributed to computers that can be located anywhere. However, there are statutory requirements for companies to retain sufficient records and audit trails which should ensure that satisfactory statutory audits can be produced.

He did, however, concede that for those companies that wished to evade tax and audit, the Internet would make their lives easier and those of the tax and regulatory authorities harder. A consequence of this was that a company's reputation for probity and fair dealing would become even more important in terms of reassuring stakeholders and stockholders.

Under the UK's 'Turnbull code', the board of directors of a company is charged with creating and maintaining an adequate system of financial controls and records. This obligation will help ensure accurate accounts. But according to Butters the key question is 'how does the Revenue (tax authority) ensure all transactions are reported.

Historically, tax compliance has relied, as a last resort, on the seizing of account books or records or the monitoring of something physical – output, stocks or numbers of employees for example. As the world increasingly moves in the direction of virtual companies and weightless outputs, auditing and taxing become increasingly complex except where there is total acquiescence by the company involved.

One idea that has gained favour is the view that tax will have to be moved closer to the point of delivery and that it will have to be associated with the physical and the tangible. In some senses, the oil and gas industries provide a model for the future.

The international nature of the oil and gas industry means companies have always been able, quite legitimately, to manage their tax affairs to generate their profits in the lowest tax jurisdictions. Governments have therefore had to rely very heavily on fuel duties and taxes, and on production levies. To avoid offsetting expenditures in North Sea oil and gas production taxes, had to be ring-fenced.

However, there may be limits to how far this process can be taken. Countries have effectively bid for oil industry investment by making production terms more attractive than their rivals. The current resistance to UK fuel duties and claims that they make UK haulage uncompetitive, versus lower taxed continental rivals suggests there may be practical limits to how much revenue can be levied this way.

Because the oil and gas industry has been able to efficiently minimise tax liabilities the impact of the Internet in reducing the cost of moving money and facilitating the use of low tax jurisdictions is likely to be less than for other less international industries.

Over recent years there has been increasing pressure from financial and regulatory authorities for companies to disclose more and more financial and corporate information. In addition there has been a progressive move from annual to quarterly reporting of accounts. In the UK, quarterly reporting of accounts is expected to become mandatory in the fairly near future.

One feature of modern computer systems is that they allow the ready generation of trial balances. These sort of balances could, in theory, be generated at little cost – monthly, weekly or even daily – giving executives a degree of monitoring and potential control undreamt of by earlier generations.

The question this then poses is – if these trial balances can be generated quickly and cheaply – should they be published to improve the perception of the company in financial markets? According to Butters, some companies are already publishing financial information on the Internet.

Although, there are some concerns about hackers tampering with the numbers, Butters says, these are not insuperable and notes that the Internet provides a very inexpensive method of publishing financial data. He went on to suggest that the accounting firms could be used to audit and validate these documents which would give them greater legitimacy and impact in financial markets. Although the requirements of audit remain unchanged, e-commerce presents a number of new challenges in arriving at their opinion.

Getting IT right

The Internet and its associated developments is relatively young, but one that has introduced a new breed of professional able to blend information technology (IT) and computing skills with creativity and business focus. *Rob Slinger*, Executive Director of REALTOUCH, explains that despite the benefits many companies are concerned about their lack of knowledge when entering this field of communication.

With few exceptions, businesses large and small seem to be in a hurry to introduce Internet technology into their communication mix. However, there is little doubt that from a business perspective, getting IT right is vital if all the advantages from this worldwide communication platform are to be gained.

The Internet and company intranets are powerful tools and if used wisely, can create a position of strength and competitive advantage. Consequently, understanding the impact of the Net within your business and market sector is essential if you are to keep pace with tomorrow's expectations and technologies. But how do you initiate implementing a scalable solution that will integrate with your current IT resource and business practices?

We can understand the daunting prospect of initiating an Internet project within a company, where often the ultimate objectives and associated benefits can become blurred as the sheer scale of opportunity is discovered. The possibilities and benefits are immense if data is captured, shared and managed efficiently, allowing everyone within an organisation to work more efficiently. But, like all new developments and changes within business, aims and objectives need to be clearly identified so that a suitable strategy can be created which will ensure the full project potential is realised, so maximising return on investment over time through the creation of a scalable solution. This is a dynamic technology that should compliment and develop businesses, not hinder or cause lack of focus.

The Internet can offer marketing, communication and revenue generating opportunities for every business, irrespective of size or location, to the largest single audience ever known – it is a worldwide communication tool that eradicates traditional boundaries. In fact the boundaries of Internet technologies are more likely to be defined by the education level and project commitment from within a business rather than its size, due to the enormous variety of options available.

A Web solution can range from a basic information delivery system in the form of a few web pages and feedback form, to a sophisticated e-commerce enabled site. The latter is database driven and integrates such elements as automated inventory control, dynamically allocated discount levels – which are dependant upon annual spend and customer profile – plus proactive intelligent tools which display promotion items in response to previous purchase patterns. The possibilities are endless.

A basic start

Building a simple website can offer a company considerable opportunities to provide information about its business. For example, product range, opening times, contact numbers and names, special promotions.... The main benefit is that these details are available 24 hours-a-day, 7 days-a-week. A website of this size works as a basic sales tool creating continuous awareness.

But having a website is just the beginning of networking all your organisational systems, ensuring the best protection and efficient use of data. Registering your site with search engines and web directories is one of the fastest and easiest ways to start getting your site attention, but this is just the tip of the iceberg. To successfully market a website, it is necessary to develop and maintain an ongoing e-marketing campaign, just as you would for a any product, special offer, or new service using traditional media.

Many companies now use the Internet not only as a sales tool, but also as an interactive intelligent advisor responding immediately to customers' enquiries. For example, help manuals, brochures or program updates can be loaded onto websites in various file formats, allowing customers easy download access to their computer. This provides a customer service centre with a whole new dimension for delivering up-to-date guidance without restriction on location or opening hours.

Unlike other information and marketing media, Internet technology solutions have the capacity to evolve, accommodate and enhance a company's growth. Advanced sites are now not only becoming interactive, but create a whole new experience for both the customer and supplier through information delivery and data capture techniques. Advanced technologies allow the creation of 'virtual products' which give the customer a greater feeling of reality – way beyond that of a brochure or promotional video – simply because the customer has control.

Companies who are investing in e-commerce models now have the ability to benefit from a new sales channel, while fulfilling automated accountancy control, stock level management, market research, customer profiling, selective customer service, and so on – all of which can be managed on a secure Internet system.

Why intranet?

Having just come to terms with the boundless opportunities available through investing in an integrated website solution, the word 'intranet' raises its head and demands attention. So where does an intranet fit into the scheme of things? It utilises the same technologies as the Internet, but operates within a company providing secure sharing of information. However, unlike a traditional network, the low cost sharing of information is not restricted to one geographic location. This allows organisations to communicate between sites whether local, national or international.

The benefits, in particular, for larger organisations scattered globally, include the speed of information transfer, which subsequently means more business can be done over time as

requests are acted upon swiftly. The additional reduction in administration costs can be considerable. It can virtually cease the need to print and post out expensive newsletters, memo's and other paper-based details. The quality of an intranet site can provide an organisation with a powerful tool in creating a 'feel good' factor within its organisation. The ability to communicate information to staff at every level reduces barriers and can provide a more even playing field, building a greater team spirit environment.

Short and long-term gains

Keeping pace with technology, creating an awareness of your company and products at a time when the Internet is new, exciting and demands attention may seem like just keeping up with the latest fashion. But, the short-term gains offer instant marketing openings. The long-term gains are that if implemented properly now, an Internet strategy will open up new areas of opportunity, increase customer service levels, and will put you in a position to act swiftly on changing and new innovations from this powerful technology.

Any pitfalls?

The biggest pit a company can fall into is by underestimating what is required when assessing the viability of Internet and Intranet (related) projects. Underestimating can, in its simplest form, be just budget considerations – the money required to implement a satisfactory solution, incorporating hardware, software and development of the solution. On a wider scale, the budget needs to incorporate issues such as staff training, ongoing content management, site maintenance and future development as experience is gained using the new facilities.

The most costly area in the underestimating arena is when a company underestimates the opportunities – that come through streamlined work practices, new market openings plus lead generation and qualification – available to them due to a lack of knowledge, poor advice or an unwillingness to make the leap into cyberspace and join the digital revolution.

However, the industry is still young and many businesses have already had their fingers burnt by 'cowboys who are out to make a fast buck'. The very open nature of the Internet makes it easy for newcomers to set up as a web development agency, which often leads to inconsistency of both service and actual quality of product produced, creating a lack of faith within the business community as a whole. The most effective defence is dealing with a reputable player, who has been in the industry from the early days, with a professional portfolio of clients.

The Internet is an industry that is moving very fast, both from a technological point of view, as well as in the increasing demands that clients are making on solution providers like ourselves. For many companies an online brochure is simply not enough, they are looking for a business tool that will provide a tangible return on investment over time. Business technology integration is the key, which requires absolute attention to detail in understanding how a client's business operates and why it operates the way it does. Only then can a strategy be developed so that a solution can be created and implemented which satisfies today's market expectations and tomorrow's possibilities.

For further information Tel: +44 (0)845 070 6000 or +44 (0)1737 370 070 or e:enquiries@realtouch.net

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Branch Activities

Aberdeen
Contact: *George Wood Tel: +44 (0)1224 205736*
7 December: Talisman Energy in the UK by Alan McAskill
11 January: Aberdeen Harbour into the 21st Century by Barclay Braithwaite

East Anglia
Contact: *Brian Holloway Tel: +44 (0)1953 601312*
8 December: The Retail Petrol Market – Past, Present and Future by Brian Handley, Total/Fina
20 January: Health & Safety – the Vital Elements in Oil and Gas Operations by T Stammers, HSE (joint meeting with IMechE)

Essex
Contact: *Arnold Carlson Tel: +44 (0)1268 794615*
12 January: The Shell Haven Story by Chris Lambert and Lou Parsons

Midlands
Contact: *Margaret Ward Tel: +44 (0)1299 896654*
21 January: Dinner dance (jointly with British Lubricants Federation)

North East
Contact: *John Sparke Tel: +44 (0)1642 546411*
25 January: Developments in Energy by Ian Burdon, Merz & McClellan (joint meeting with the Institute of Gas Engineers)

Northern
Contact: *Alan Holt Tel: +44 (0)161 875 3242*
1 December: Visit to JCB factory (jointly with Stanlow Branch)
25 January: Site visit to the Great Lakes Chemical Corporation, with a talk on fire resistant fluids

South Wales
Contact: *Steve Vines Tel: +44 (0)1646 600679*
7 December: Stress and the Strain of Life by John Stacey of Withybush Hospital
18 January: Visit to Thomas Within Brewery, Llandeilo

Stanlow
Contact: *John Wellsteed Tel: +44 (0)151 479 4962*
1 December: Visit to JCB factory (jointly with Northern Branch)
20 January: AGM, and Sharing a Vision by a speaker from Shell

Yorkshire
Contact: *Ivor Bennett Tel: +44 (0)1484 713201*
11 December: The World of Biocides (speaker TBA)

The birth of business-to-business e-commerce

Qasim Shaikh, one of the founder Directors of Ewbank Solutions, describes the way in which they planned and developed an Internet-based company to provide engineering solutions to the oil and gas industry.

It's 1996, one of our founder Directors Mike Goodman is in an Imperial College computer centre using the Internet for the first time to find information for an assignment.

Early search engines and Netscape used to throw up a fraction of the number of matches that today's myriad of searching tools do – however bad the matches are! A request, a followed link, an e-mail and a reply from a helpful expert and the back of the assignment is broken. 'Hmm, perhaps we're onto something here'...

Nearly two years later our incubation period was over and our first exciting and innovative new company, Ewbank Solutions Ltd was incorporated and shortly thereafter the company website – **www.ewbanksolutions.com** – was published.

Before we go further, let's introduce the team: a recent MBA, a management consultant, and two influential engineering heavyweights. An unusual, but balanced, mix of talents for a new company.

So what was the objective? Well, it was going to be different, the Net would make sure of this. But could we make the oil and gas engineering service industry change? We thought so and here's how.

Back to basics

By going back to basics we reminded ourselves of the simple fact that in the oil and gas macro-environment only the oil and gas companies generate cash or bring money into the system. Our aim would be to help oil and gas companies achieve efficiencies in whatever ways we could, or were requested for by the served companies. If our services were valued we would undoubtedly be successful, ultimately sharing the gains we helped our clients achieve.

By the end of our introspective period we had decided our company would be totally unique and our uniqueness would stem from the following:

- We would use the Internet to deliver information and consulting directly to our clients desktop.
- We would be geographically, and therefore time zone, diverse. We would operate 24 hours a day.
- We would specialise in short projects (say between a few and a few hundred man hours) which were ideal for web delivery. This market is ignored by the advice providers but we believe it is a fundamental key to aiding client progress.
- Clients would specify their own fee for a particular assignment (however, we would provide an estimate if preferred). The assignment would correspondingly reflect the real value of the work. Our challenge would be to get the output level commensurate with the value. Everything we did would be fixed fee.
- Our advice would be completely independent and impartial, ensured by our complete independence from other industry entities.
- Our clients would be introduced to free software tools located on our website. We wouldn't charge to do the things our clients could do more quickly or efficiently. We wouldn't re-invent the wheel or sell the same old thing time after time.
- We wouldn't be a deal-chasing company. We strongly disagree with the adversarial approach used by some companies.
- Where possible we would supply information to the industry without cost.

Our environmental and ethical policies were designed to also be industry leading:

- We would remain a paperless and travel-less company. We would instead use any means within reason to achieve this.
- We know firsthand the disastrous effects of corruption on countries around the world. Corrupt projects ultimately destroy capital and prevent value-added projects in areas where they are often sorely needed. We took the decision that we would never pay any fee unless in the process of earning the fee there was real work and real value added to the situation.

That is how we are different. So how did we implement this vision?

When we started there were hardly any Internet companies and web designers were few and far between (sandal wearing hippies and/or charging six figure sums!). This forced us to develop our first website in-house. We used frame pages at a time when some browsers couldn't read them and our early sites were some of the most complex around.

At the outset we were concerned not to push things too hard, we wanted first to develop the concept more fully and also to avoid over-committing the company and its resources.

We needn't have worried – as the Internet traffic increased, the system slowed down to a crawl. At present, search engines take months to pick up sites reliably. We succeeded in our attempt to have our site listed.

Knowledge centre

Initially we highlighted the knowledge centre nature of our site. However, this concept was not understood at all. Feedback showed that no-one in the industry, except perhaps the client IT departments, had any idea of what was meant. As time progressed, we drifted the direction of our website a little to become an online oil and gas consultancy, something which clients were familiar and happy with.

We have begun a limited marketing campaign, mainly to get a feel for how the industry perceives the company. We are also in the process of pulling in second stage funding.

As a company we have had our difficulties – certain parts of the website were simply not used. Literally no-one was the slightest bit interested in the discussion area. There existed a very real resistance to using financial payment systems on the Net. People were also reluctant to place their trust in people that their companies could not see or talk to.

Next month we hope to have venture capital in place and with the pending acquisition of an existing company we hope to move to the next stage of our development. The e-commerce concept is rapidly changing, we intend to change with to maintain our lead.

For further details, contact Qasin Shaikh on Tel: +44 (0)1372 466774 or visit **www.ewbanksolutions.com**

Interactive job search and placement

The strength of the Internet in providing a single reference point accessible to all makes it a natural choice for a recruitment site aimed specifically at the petroleum and chemical industries. *Arend van Campen* of Petro Assistance explains the logic behind the development of the new Petro-Jobs.com site.

Our view at Petro Assistance was that the time had come to create an industry standard in job searching for the petroleum and chemical industry. We felt that one interactive site for all was the best solution and as a result, we have developed the **Petro-Jobs.com** site to enable companies and professionals to be linked.

Recent mergers and acquisitions by large petroleum companies (BP, Mobil, Exxon, Amoco, Total, Fina and Elf) and chemical companies (Arco, Lyondell and Equistar) have led to literally thousands of people being made redundant. Refineries are closing down, engineering projects are being postponed, as well as other employment reducing changes such as outsourcing.

Future employment

Many people are now facing challenges. Where to go when you are suddenly out of a job? And what can the Human Resources Department of a large company do with the redundant staff?

As an individual, you can call other companies and see if they want to hire you. You can also check the Internet and find a vast number of head-hunters, temporary personnel agencies and jobs or vacancies, but these are usually too general to be really useful. You could also check the Sunday papers, create a resumé and send it to many addresses. But this takes too long and has minimal effect.

As a company you can help the dismissed personnel by looking for job openings within your own organisation as well as the outside job market.

Compared with these actions, the use of **Petro-Jobs.com** is simple, easy and effective. The site is set up and operational. It is immediately available to serve all major Oil & Chemical locations and ports in the world, including Rotterdam, Houston, Singapore, and more. Being a website it is available 24 hours/day, 365 days/year.

Cyber-search

A website offers a number of advantages to both employers and employees.

For employers:

- Redundant personnel can be registered.
- Vacancies to help and outplace staff can be found.
- The company's own database of available people can be linked into the site.
- Professionals to fill job openings can be found.
- Banners and hyperlinks on pages can be placed.
- Job openings can be advertised.

An additional service is that the professional can be outsourced and (re)hired. Petro Assistance hires the man or woman required and rents them to the company for the duration of the work. No hire, no fire, no payroll – it is all taken care of by Petro Assistance.

For employees the benefits are:

- Registering your availability and resumé.
- Finding companies looking for your skills.
- Advertising your skills.

Similarly for competitors, contractors, temporary personnel agencies and subcontractors the site can be used to register petroleum or chemical professionals. If a position is found in the database, they are free to employ the person – although a minor finder's fee would then apply.

For more information contact: **sales@petro-jobs.com**

The law catching up with e-commerce

In order to get some idea of the legal implications of e-commerce, *Petroleum Review* asked *David Grossman*, Head of E-Commerce at the London based-law firm Berwin Leighton, for his opinion on a range of topics.

Q To date there has been only limited Internet law and relatively few legal precedents. The situation is now changing. How do you see Internet law developing in general?

A Both legislators and courts are, to some extent, playing catch-up following the massive developments of the Internet in the last few years. We have seen both European and domestic attempts to legislate for e-commerce. On a European scale, a distance selling directive already exists and there are currently draft directives on electronic commerce, electronic signatures and distance selling of financial services. In the UK, we also have a draft Electronic Communications Bill which deals with the key issues of legal recognition of electronic signatures; the establishment of an approvals regime for providers of cryptography support services; and the introduction of new powers for the police and other law enforcement authorities to require the disclosure of keys necessary to make encrypted messages readable. It is likely that the bill will soon be split into two, with the law enforcement provisions being removed from the existing bill. The Electronic Communications Bill is likely to become law towards the end of 2000.

There are notable areas that existing draft legislation fails to address, but which will need to be dealt with in the future. In particular, the bill does not deal with the tax and customs issues that are so critical to e-commerce.

In terms of case law, there have been some high profile cases involving companies registering domain names in the name of famous corporations and then attempting to sell those domain names to those large companies. This is known as 'cybersquatting'. Since a recent court case brought by companies including BT and Marks & Spencer, the practice of cybersquatting has declined substantially.

Q The EU has just announced that disputes relating to Internet transactions can be tried in the customer's legal jurisdiction. Does this override any agreement made between the parties? If not, will there be a tendency to make the legal jurisdiction part of the contract, greatly favouring, the common law based, US and UK law?

A The proposals to which the question relates are changes to the Brussels and Rome Conventions of the European Union. These conventions deal with conflicts of jurisdiction and law within Europe. The proposed changes would give the courts of a buyer's home country jurisdiction over contracts for suppliers of goods and services sold from another member state. They would override a term to the contrary in a written agreement. It is critical to appreciate, however, that these proposals only relate to contracts with consumers. In many ways, this is unlikely to affect the oil industry to a significant extent as most contracts are between businesses. In any case, the EU's announcement is currently at the proposal stage only and may be amended before it becomes law.

Where contracts are made between businesses, court proceedings should usually begin in the defendant company's home country. Generally, this is only the case where the written contract does not specify something different. Any well-written contract will specify both which country's laws should apply to the contract and which country's courts should hear any disputes. Although these need not necessarily be the same, they often are.

Q The US government has indicated that Internet transactions will not be subject to tax before 2002. How wide is this exemption? Who can use it?

A In common with governments worldwide, the US administration is currently struggling with how Internet transactions should be taxed and made subject to customers duty. No formal exemptions have been granted.

In advance of the forthcoming world trade talks in Seattle, the US government has given some indication of its position on these issues. It has made clear that it is opposed to any new customs duties on online delivery of goods and services (such as electronic delivery of music and software). This would not truly be an 'exemption' because there are no duties on these transactions at present. Although the US wants to see a permanent ban on duties. Pressure from other countries means that the US may have to settle for a two-year moratorium.

Q The oil industry is just starting to move to paperless procurement (e-commerce) on the Internet. What are the legal problems and pitfalls?

A There are many legal problems and pitfalls which are associated with e-commerce. In almost all cases, the risks associated can be reduced by taking some simple steps early on. Some key issues include:

- Domain names – these act as the identifiers for the sites on the Internet. Each domain name is unique and there is particularly fierce competition for the top level domain name '.com'. Generally, domain names are issued on a 'first come, first served' basis, so companies should make the relevant applications quickly if they have not already done so. As noted above, the practice of cybersquatting has reduced dramatically in recent months as a result of several high profile court cases.
- Formation of a legally binding contract – (see the answer to the next question).
- 'Partner agreements' – many e-busi-

nesses are reliant in one way or another on arrangements with 'partner' companies. In this context, 'partner' is used in the commercial, rather than the legal, sense. Agreements with Internet partners can come in a variety of forms including agreements for advertising, content, and web design and hosting. Any important agreements reached should be documented as they often represent critical commercial arrangements.

- Evidence – Keeping records of all contracts entered into is critical if the contract is later questioned or investigated. The evidence which should be kept include details of customers' orders, website design, and any terms and conditions which the customer agreed to.

Q In legal terms, how does an Internet transaction differ from a conventional transaction? There has recently been some publicity about when exactly a contract is established. Can you clarify this?

A The principles of electronic contracting are the same as those which apply to any other type of contract. The four elements of a contract – offer, acceptance, payment or promise (known as consideration) and an intention to enter into a legally binding contract – must all be present. Much recent publicity has focused on when an offer is accepted and a binding contract entered into. The debate centres around what is an 'offer'. Legally, an advert or website is usually regarded as an invitation for the buyer to make an offer, and not an offer in itself. If a website did constitute an offer, a customer would be able to 'accept' the offer and form a binding contract by doing so. This may oblige the website owner to fulfil the order, even in a situation where this would be very difficult – perhaps due to lack of stock.

These problems have recently been highlighted by Argos, the catalogue retailer who advertised on its website a television worth £300 for £3, due to a software error. Argos only noticed the error after hundreds of orders had been placed and it subsequently refused to honour any of those orders.

The European draft directive on e-commerce attempts to clarify issues in respect of the time at which an electronic contract is concluded. In the latest draft, the EU has proposed that to conclude a contract there must be three stages: an offer, an acceptance and an acknowledgement. The additional requirement for an acknowledgement would be a fundamental change to current law.

Under current law, the issue of when a contract is concluded remains unclear. It is therefore important to state clearly in the terms and conditions of a website how and when any offer will be accepted.

Q Currently there are two patent infringement cases coming before the US courts: Amazon.com is defending a repeat order system and Priceline.com is defending a reverse auction system. These both have the potential to block or complicate systems being developed for oil industry transactions. Can you comment?

A Computer-related patents are not new, but recently more and more companies are obtaining patents for computer related inventions, including novel ways of doing business on the Internet. The monopoly granted in relation to a patent is much wider than the right to prevent copying alone which is traditionally associated with software. The recent flood of applications for computer-related patents in the US have caused commentators to question whether they should be allowed and whether or not they relate to an invention that is truly novel or inventive. If Amazon is successful in showing that its patent is valid and has been infringed, and if an oil business uses a similar system that infringes that Amazon patent without Amazon's consent, then it too would be at risk of a successful claim being made against it.

Q Logically, if Amazon.com succeeds it could inhibit all sorts of Internet payment systems to banks and energy companies. Is this really likely?

A If its patent is upheld by the courts, Amazon will be able to rely on it, to prevent others from using inventions that would infringe its patent. In a similar case, brought by a company called Signature Financial Group, the US Supreme Court upheld the company's patent for a computer-based method of implementing an investment structure.

Theoretically, if companies like Amazon and Priceline succeed many thousands of new ideas and businesses could be prevented from coming to market. In reality, there has been so much criticism of the granting of these types of patents that courts are likely to take a fairly strict approach when analysing whether another company is infringing patents of this kind. Except in the case of blatant abuses, courts are likely to strain to find against the patent owner. To do otherwise would be to inhibit e-commerce to perhaps an unacceptable degree.

Targeting gas and foreign investors – Part 2

Last month's *Petroleum Review* looked at recent E&P developments in the Asia-Pacific region which are being driven by the need to encourage foreign investment in the search for hydrocarbons, in particular gas. In Part 2 we review developments in Australia, Indonesia, the Timor Sea Zone of Cooperation and Japan.

In preparing the second part of our review of recent trends and upcoming oil and gas developments in the Asia-Pacific region, we have drawn extensively on recent reports from Edinburgh-based consultant Wood Mackenzie and the UK's Infrastructure and Energy Projects (IEP) Directorate, together with information supplied by the Australian Petroleum Production Exploration Association (APPEA), among others. *Petroleum Review* would like to thank all concerned for their help and assistance.

Australia

Over two-thirds of Australia's primary energy consumption is met by coal and oil. Of the 103mn toe consumed in 1998, approximately 44.5% of demand was met by coal, 36.3% by oil, 17.8% by gas and 1.4% by hydroelectricity. The country is totally self-sufficient in coal, producing more than three times its annual requirements. Reserves are estimated at 90,400mn tonnes. However, Australian oil production covers just 73% of the country's requirements and, with an oil R/P ratio of 13.5 years, oil imports look set to continue to rise.

The country is 100% self-sufficient in gas and is a major exporter, exporting about one-third of its production in the form of LNG. Much of its gas production is exported to Japan – approximately 7.5mn t/y. In 1998 Australia produced 30.6bn cm of gas and consumed 20.3bn cm. Gas reserves are put at 1.26tn cm, much of which lie in the Carnarvon Basin on the North West Shelf. These reserves underpin a planned doubling of Australian LNG exports, primarily to Asian markets, which are predicted to rise to 15mn t/y by 2005. Domestic gas demand is predicted to grow by 5%/y in the period to 2010.

According to Peter Livingston, Manager of the Exploration Section of the Petroleum and Electricity Division of the Australian Department of Industry, Science and Resources, 'by any measure, Australia is underexplored'. Speaking in London earlier this year he said: 'In the entire Australian offshore area there have been less than 2,000 exploration and development wells drilled. In comparison, there have been over 60,000 wells drilled in the Gulf of Mexico alone – an area smaller than the Carnarvon Basin off the west coast of Australia.'

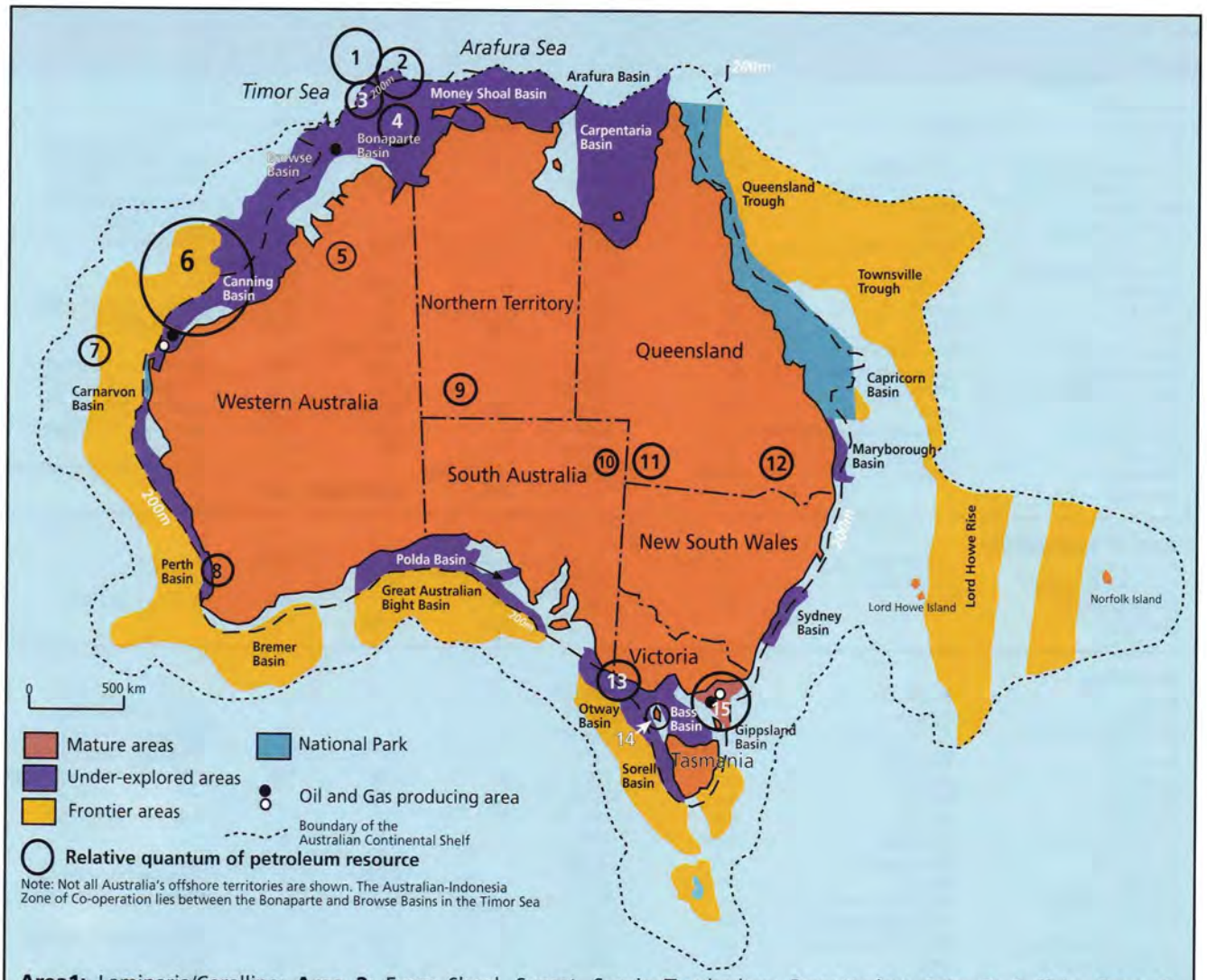
Although the country may be 'underexplored', it is not unprospective. Exploration activity picked up significantly during 1998 and, reflecting the number of successful discoveries in earlier months, the Australian Government released 57 blocks in its 1999 offshore licensing round – a record number. The majority of the areas lie in the Bonaparte and Arafura Basins (offshore the Northern Territory), the Central North West Shelf and Carnarvon Basin (offshore Western Australia), the Bight Basin (offshore South Australia), the Torquay Sub-Basin and Gippsland Basin (offshore Victoria) and the Bass Basin (offshore Tasmania). Most of the areas have received some exploration in the past, but many are only lightly drilled and most fall within the underexplored category. The areas are being offered in two tranches, with closing dates of October 1999 and April 2000.

A new Offshore Petroleum Strategy was unveiled during the 1999 acreage release. Providing a framework for the efficient exploration of Australia's continental shelf during the next five to ten years, the new Strategy aims to create more certainty in the acreage release process and give industry more lead-time in considering areas for future release. According to Livingston, the Strategy 'provides, among other things, a new offshore exploration acreage release programme, improved access for explorers to low-cost geological and geophysical data [through the development of a national petroleum information programme], and the outline of an enhanced programme of regional geophysical work to be undertaken by the Australian Geological Survey Organisation [AGSO]'. Much of AGSO's work will focus on identifying prospective new oil zones in the frontier areas of the exclusive economic zone, particularly the southern continental margin of the Great Australian Bight.

AGSO has classified the offshore regions into mature, submature, immature and frontier categories and the new offshore exploration acreage release programme will limit the size of acreage release according to the area category. For example, new areas in mature regions will be a maximum of eight graticular blocks, about 600 sq km, while new areas in frontier regions will be a maximum of 80 graticular blocks, about 6,000 sq km.

Nominations for the 2000 offshore licensing round – expected to include vacant acreage in the Perth Basin, Exmouth Plateau, western-most Bonaparte Basin and Petrel Sub-Basin – were due in by the end of August this year. Future licensing rounds are forecast to place an increasing emphasis on deepwater areas such as the Lord Howe Rise, the Bremer Basin and the South Tasman Rise.

The fall in oil prices to their lowest point in 25 years during 1997/98 and the resulting tightening of company exploration budgets led to a slowing of petroleum development and exploration activity in 1999. APPEA forecast earlier this year that total expenditure would fall from A$3.3bn in 1998 to a



Area1: Laminaria/Corallina; **Area 2:** Evans Shoal, Sunset, Sunrise/Troubadour, Bayu-Undan; **Area 3:** Buffalo; **Area 4:** Petrel/Tern; **Area 5:** Brecknock; **Area 6:** Angel, Bambra, Dockrell, Echo/Yodel, Gipsy/Rose/Lee, Gorgon/Tryal Rocks, Sparn/Chrysoar, Dionysus, Hermes, John Brookes, Keast, Lambert, Legendre, Macedon, NWS, Expansion, Perseus, Pyrenees, Reindeer, Roller/Skate, Seanipple, Wilcox, Wonnich; **Area 7:** Scarborough; **Area 8:** Mondarra; **Area 9:** Mereenie/Palm Valley; **Area 10:** Moomba Area; **Area 11:** Jackson Area, SWO Gas Plant, Tintaburra Area; **Area 12:** Roma/Surat; **Area 13:** Fenton Creek, Minerva; **Area 14:** Yolla; **Area 15:** Blackback/Terakihi, Patricia-Baleen, Turrum, Kipper.

Australian Fields with Development Potential

maximum of A$2.4bn in 1999. Member companies were forecast to spend between A$796mn and A$1,234mn on exploration activity, while development expenditure was predicted to be between A$1,112mn and A$1,203mn. Offshore activity remains strongest in the Carnarvon Basin in Western Australia, where over half of all national offshore exploration and development expenditure is to be spent. The biggest fall in activity during 1999 has been onshore.

Recent exploration concession permit awards include W98-13 on the North West Shelf offshore Western Australia to Oryx NW Shelf Australia Energy, a subsidiary of the Kerr-McGee group; W98-12, 14 and 15 to consortia including local divisions of Shell and Chevron; W98-18 to an Idemitsu/Agip/Eni and OMV consortium; W98-19 to Woodside Energy; and W98-22 to Magellan Petroleum. Others include NT/P55 to a consortium comprising Woodside, Shell and BHP; NT98-6 to Woodside and Shell; W98-2 and 3 to Magellan Petroleum; and W98-26 and 27 to BHP Petroleum.

Shell and Woodside Petroleum, as part of the North Australian Gas Venture (NAGV), revealed plans earlier this year to pipe Timor Sea gas 450 km from the Greater Sunrise and Evans Shoal fields ashore at Darwin to meet the potential needs of the Northern Territories and Queensland markets as well as exports. The proposed LNG plant near Darwin would comprise two processing trains, two LNG storage tanks and a 3.5-km loading jetty. A domestic gas production plant designed to supply 400mn cf/d of gas is also planned, together with support facilities and infrastructure. First sales gas is not expected before 2010. The project – which is expected to cost up to $8bn – will compete with the more advanced Chevron-led project to pipe Papua New Guinea gas from the Kutubu and other fields to Queensland, Australia, via a new pipeline (see PNG review in Part 1 of this article in the November issue). First gas is expected from the Chevron project around 2002.

Fields which came onstream in 1999 include the Esso-operated Blackback oil field, tied back to the Mackerel platform, and Santos' Mylor and Fenton Creek fields in the onshore Otway Basin, understood to be the company's first ever gas production in Victoria, Australia. Santos also reported in mid-

Asia-Pacific regional round-up

Country/Field	Operator	Oil or Gas output	Start-up date	Oil Res. (mn b)	Gas Res. (bn cf)	Capex ($mn)	Production system
INDONESIA							
BD (Madura)	Mobil	gas	2005+	20	437	310	platform
Bentu	Santos	gas	2002+				nr Asamera-Duri p.line
Block A, N Sumatra	Gulf Indonesia	gas	2002		585		supp. to fertilizer plant
Corridor blk gas dev*	Gulf Indonesia	gas	Oct-98	–	2,100	522	onshore for Duri field
Merah Besar	Unocal	oil/gas	2001				tieback to West Seno
Natuna D Alpha	Exxon	gas	2010+				16 platforms
NSO 'A' field	Mobil, in Malacca Strait	gas	Jul-99	–	1,400	500	Nnm platform
Nelayan (Kakap blk)	Indonesia		end-98	–	–	–	–
Sisi/Nubi	TOTAL	gas	2007	40	2,700	200	joint dev't
Pase A*	Mobil	gas	1998	–	120	93	onshore to Arun LNG
Peciko	TOTAL	gas	2000	100	5,600	1,250	Two platforms
Singa, in S Sumatra	Amerada Hess	gas	2005+		500-1,000	–	–
Sirasun/Terang	Arco, in Java Sea	gas	2005+	–	1,100	500	subsea via Pagerungan
Sth Lho Sukon A&D	Mobil	gas	1998/99		790		Gas supply to Arun LNG
Tangguh	Arco	gas	2006+	50	18,400	1,750	onshore, platform
Natuna West	Conoco/Premier/Gulf Indonesia	gas	2001	–	2,500	1,100	plat., pipe to Singapore
Wunut*	Lapindo	gas	Jan-99	–	105	30	onshore
West Seno	Unocal	oil/gas	2002	150mn boe	–	–	Mini-TLP + barge prodn facils
Sub Total				**360**	**36,337–36,837**	**6,255**	
ZONE OF COOPERATION							
Bayu-Undan	BHP/Phillips	cond/gas	2002/03	404	–	1,620	platform
Bayu-Undan (LNG)	BHP/Phillips	gas	2005/06	–	3,400	–	–
Elang/Kakatua*	BHP	oil	Jul-98	15	–	105	4 subsea via FPSO
Sub Total				**419**	**3,400**	**1,725**	
AUSTRALIA							
Angel	Woodside	gas/cond	2000/2001				
Bambra	Apache	gas	2002+				wellh'd plat to Harriet
Blackback, Bass St	Esso Australia	oil	end-99	40	–	30	Subsea to Mackerel plat.
Brecknock	Woodside	oil/cond	2005+		–	–	Poss. LNG development
Chrysaor*	WAPET	gas	2002**	40	2,600	150	**part of A$10bn project
Dionysus*	WAPET	gas	2010	–	2,400	–	–
East Spar*	Apache	gas/oil	Nov-96	28	–	–	subsea to Varanus Is.
Echo/Yodel/Dockrell	Woodside	cond	2005+	–	–	–	–
Evans Shoal	Shell Australia	gas	Jun-09	–	5,000	–	–
Gorgon*	Wapet	gas	2002**	14 oil,50 cond	6,600	–	poss 6mn t/y LNG plant
Lambert-Hermes	Woodside Petroleum	oil	'97 (Ph1), '00 (Ph2)	–	–	–	Tieback to Cossack FPSO
Legendre	Woodside Petroleum	oil	2001	25	–	–	–
Loxton Shoal/Sr/Trb	Woodside Petroleum	gas	2010	–	5,000	–	Darwin LNG, 7.5mn t/y?
Macedon/Pyrenees	BHP	gas/oil	2004	11	580	160	platform
Manta/Basker (Bass Strait)	Shell Australia	oil?	2000-01	–	–	–	FPSO and subsea
Minerva (off Victoria)	BHP	gas	under eval	–	–	–	Subsea or mono-tower
Nappamerri trough	Santos	gas	end-03	–	–	–	–
Perseus*	Woodside	gas/cond	1999+	–	11,500	–	North Rankin + subsea
Ramillies	BHP	oil	2002+	–	–	–	–
Reindeer	Apache	gas	2001	–	600	–	–
Scarborough	Esso Australia/BHP	gas	2005+	–	8,000	265	proposed LNG?
Scott Reef/Brecknock	Woodside	gas/cond	–	306	20,000	–	–
Spar	Chevron/Texaco/Ampol/Shell*	gas	2002*	–	–	–	–
Stag*	Apache	oil	early 1998	35-55	–	–	fixed plat. 50,000b/d cap
Tern/Petrel Bonap'te	Santos	gas	2005	–	3,000	160	platform or FPS
West Tyral Rocks*	WAPET	gas	2010	19 oil, 21 cond	1,600	–	–
Wonnich*	Apache	gas/oil	mid-99	–	–	–	NNM plat to Varanus Is.
Woollybutt	British-Borneo	oil	2001	25	–	–	platform
Yolla	Boral Energy	oil/gas/cond	2000+	300	600	–	platform
*Greater Gorgon field development, subsea drill centres to be installed as required to service onshore LNG plant with 2.3mn t trains							
Sub Total				**914–934**	**67,480**	**765**	
TIMOR GAP-ZOCA							
Buffalo*	BHP	oil	4Q1999	22	–	–	wellh'd platform to FPSO
Laminaria/Corollina*	Woodside	oil	4Q1999	253(140)	253(140)	–	170kb/d, 1.4mn b FPSO, 6ss
Laminaria East	BHP	oil	–	11,000b/d test	–	–	close to Buffalo field
Sub Total				**275**	**253**		
NEW ZEALAND							
Kupe South	Fletcher Challenge	gas/oil	2004	–	286	250	platform
Mangahewa	Flectcher Challenge	gas	2004+	–	1,000	213	–
Sub Total				**–**	**1,269**	**463**	
GRAND TOTAL				**1,968–1,988**	**108,783–109,283**	**9,178**	

Key: * – already onstream

Source: Wood Mackenzie and Petroleum Review

Current and planned field developments in the Asia-Pacific region

1999 that its Pondrinie North 1 appraisal well had flowed 2.7mn cf/d of gas, confirming the extension of the Pondrinie gas field in the Cooper/ Eromanga Basins of South Australia.

The A$1,370mn Laminaria/Corallina fields came onstream in November 1999 (see p32), and will significantly increase the Timor Sea's contribution to total Australian output. The Woodside-operated Laminaria/Corallina development, currently the deepest water project in Australia, is being developed via subsea tie-backs to the purpose-built *Northern Endeavour* FPSO (said to be the largest newbuild FPSO in the world) capable of handling a maximum oil production of 170,000 b/d and storing 1.4mn barrels. The 22mn barrel Buffalo field, located near the Laminaria/Corallina development, is due onstream before the end of this year. Development comprises a three-legged wellhead platform in shallow water, connected to an FPSO permanently moored to a single point mooring system. Production is expected to peak at 40,000 b/d.

Future fields due onstream include the Greater Gorgon gas fields – Gorgon, Chrysaor, Dionysus, West Tyral Rocks and Spar – located 200 km offshore the Burrup Peninsular and being developed by WAPET on behalf of Chevron, Texaco, Mobil and Shell. Proved gas reserves are put at 13.8tn cf, with potential reserves estimated at 21.5tn cf. The first field to be developed will be Gorgon. The development plan consists of subsea well clusters tied back to a shallow-water platform for separation, dehydration and, later in the project, decompression. Produced gas will be piped ashore by a 230-km pipeline and converted into LNG at a new processing plant on the Burrup Peninsular. The plant will comprise two trains, each capable of producing 4mn t/y of LNG at full production. Gorgon LNG will be marketed to China, Korea, Taiwan and India, as well as to the domestic sector. Expected discoveries during a three-year, seven-well exploration programme begun earlier this year provide the potential for future expansion of the project.

Woodside's A$110mn Legendre oil fields project on the North West Shelf was recently given approval by the Australian authorities. The fields will be developed through three horizontal production wells in the Legendre North field and one in the Legendre South field. Oil from the mobile offshore production unit (MOPU) (a converted jack-up drilling rig) will be exported via subsea pipeline to a mooring system, from which it will be offloaded into either a dedicated floating storage and offloading (FSO) vessel or directly into trading tankers.

Development of this marginal field has been made viable because the partners – Woodside (45.94%), Apache Energy (31.5%) and Santos (22.56%) – will not own the production facilities. Instead, Houston-based Oceaneering International is to provide the MOPU (paying for the conversion of the drilling rig), owning and operating the facility for a fee. It is understood to be the first time that such a services agreement has been used in Australia and is reported to have at least halved the project's capital costs. Proven field reserves are 20mn barrels of oil with possible reserves put at 40mn barrels. The project is expected onstream in mid-2001, with an expected production rate of between 40,000 b/d and 50,000 b/d.

Other development opportunities include the undeveloped 50bn cf Golden Beach gas field in the Gippsland Basin.

Shortly before *Petroleum Review* went to press, Shell announced plans to sell its 28.57% and 35.71% stakes in the maturing Barrow Island and Thevenard Island oil fields offshore the northwest coast of Western Australia. Field reserves are 110mn boe and 35mn boe, respectively. The company plans to look at new opportunities, including exploration in the Canning Basin. Shell also recently reached an agreement with the Australian government to abandon further exploration of the Cornea oil prospect offshore Western Australia, which has produced 'disappointing' results. It is understood that the company is now to spend the A$30mn earmarked for Cornea in the Browse Basin.

Elang development, ZOC

Moomba project, South Australia

Ballera gas plant, Australia

Indonesia

Although the financial crisis of 1997 had a serious impact on the Indonesian economy, the rupiah stabilised in the latter part of 1998 and the future economic outlook appears more bullish, albeit still depressed. As Wood Mackenzie points out, 1998 was a politically momentous year for the country, with student and national uprisings leading to the deposition of President Suharto. Vice President Habibie stepped in and the situation has since quietened.

According to the *BP Amoco Statistical Review*, Indonesia has a proven reserves figure of only 5bn barrels. According to Wood Mackenzie, proven and probable reserves are 5.3bn barrels of liquids, wuth a further 113tn of gas – giving a total of 25.2bn boe. Sumatra alone holds a large percentage of the country's proven and probable reserves, and accounts for 60% of production (averaging 1.5mn b/d in 1998).

Gas is becoming increasingly important to the country as it endeavours to reduce its reliance on oil. It has signifi-

Stag1 platform, offshore Western Australia

cant proven reserves of 72.3tn cf and discoveries have been made in North Sumatra, East Kalimantan, offshore Java and Irian Jaya. The country is the world's largest exporter of LNG. Although much of Indonesia's current gas demand is met by onshore reserves, significant finds have been found offshore and exploration is moving to deeper waters. Gas production has doubled over the past 10 years and new finds have ensured that reserves remain high.

The majority of Indonesia's oil producing fields are located in central and western areas. New exploration has focused on frontier regions, in particular eastern Indonesia. The government has estimated that $3.5bn or more will be required annually to locate new oil and gas deposits.

Despite the relatively harsh fiscal regime and difficult economic conditions, 22 new contracts were signed in Indonesia in 1998, 10 of which were located in eastern Indonesia (Sulawesi, Irian Jaya and Timor). A significant level of activity remains, however, in the more mature western basins of Sumatra, Java, Kalimantan and the Natuna Sea with 12 new contracts signed in 1998. More recently (September 1999), Pertamina awarded new oil and gas exploration and production contracts to Lasmo for the Krueng Mane block offshore north Sumatra, Shell for the Ambalat block offshore East Kalimantan, Apex for the Yapan block offshore Irian Jaya, and PT Petromer Bengara Energi for the offshore Bengara block. It is understood that the companies are required to invest at least $96mn on exploration during the first 10 years of the 30-year contract periods.

Exploration activity rose in 1998, with a total of 138 exploration and appraisal wells drilling during the year – representing a 20% rise over the 1997 total of 115 wells. Much of the activity focused on the Natuna Sea (in particular by partners in the West Natuna gas project, primarily aimed at proving up gas reserves) and Kalimantan (as part of Unocal's deepwater exploration programme). Most significant among Unocal's discoveries was West Seno, a complex of deepwater finds, which is now expected to undergo fast-track development.

A total of nine new fields came onstream in 1998, including Makmur on Santa Fe's Jabung production sharing contract (PSC), which has been developed as a tie-back to the North Geregai infrastructure. Two discoveries were brought into production on the Kakap PSC: Ketam and Jangkar, tied back to the KRA and KH platforms respectively. The two fields have estimated combined recoverable reserves of 5.8mn barrels of liquids and 60bn cf of gas. Mobil brought its Pase A field onstream during October 1998. Produced gas is exported via Mobil's South Lho Sukon fields to the Arun LNG plant where it becomes feedstock for existing contracts with Japan and Korea.

First gas was also produced from the Corridor fields in October 1998, to the Caltex-operated steamflood project in the Duri heavy oil field in central Sumatra. The Corridor PSC is estimated to hold 2.4tn cf of sales gas, a large proportion of which (42%) is located in the Sumpal field, with the Dayung and Gelam fields also making significant contributions. The fields are being developed in two phases at a cost of $615mn: Dayung, Gelam, Letang and Tengah developed first, the remaining fields due onstream in 2000. The high level of carbon dioxide (CO_2) in the gas has necessitated the construction of a large CO_2 stripping facility at Grissik.

Arco was understood early in 1999 to be planning to spend up to $3bn on the development of its gas resources in Irian Jaya. The company's Berau and Wiriagar blocks, together with BG's nearby Muturi PSC, are estimated to hold over 18tn cf of gas reserves. These three fields will provide the feedstock for a multiple-train LNG project called at Tangguh. A ninth LNG train is also planned at the Bontang LNG plant.

Fields onstream in 1999 include PT Caltex Pacific's Piala oil field in Bengkali, Riau, in September, at an initial rate of 2,000 b/d.

Other potential projects are associated with fields in the Timor and Natuna seas. Earlier this year, a group of companies led by Conoco signed a gas sales agreement with Sembawang Gas to gather gas from three PSCs and supply it to Singapore. Some 325mn cf/d of gas will be supplied from Conoco's Natuna Sea Block B, Gulf Indonesia's Kakap and Premier's Natuna Sea Block A projects in West Natuna via a new 420-km pipeline to Singapore from 2001 for up to 22 years. The nearby large Natuna D-Alpha gas field (held by a consortium led by Exxon) is also said to have great potential, but there are problems associated with the high (70%) CO_2 content which could push development costs to $40bn.

A number of Indonesian asset trades have been made recently, including Arco taking on all of Union Texas' assets for $3.3bn last year. Indonesia was Union Texas' core producing area, contributing around 37% of the company's total net proved reserves. Union Texas' share in the Sanga Sanga PSC, which feeds the world's largest LNG

Stag 2 platform

plant, Bontang, in East Kalimantan, was thought to be a key driver of the deal. Other deals included Veba of Germany acquiring all of Deminex's interests in Indonesia (and southeast Asia) after the joint venture comprising Veba, RWE-DEA and Wintershall was dissolved.

As *Petroleum Review* went to press, it was announced that Indonesia had initialled an agreement to supply gas from Sumatra to Singapore, with first gas due to flow in mid-2002.

Timor Gap Zone of Cooperation (ZOC)

The first petroleum development in the ZOC – the Elang/Kakatua/Kakatua North project – came onstream in July 1998. The $105mn field has been developed via four vertical wells with subsea completions tied back to the leased Modec Venture-1 FPSO.

However, in other respects, 1998 was a quiet year for the region, with no licensing activity despite the Area A acreage release and a fall in the number of wells drilled. It may be that bidders in the Area A licensing round were cautious regarding the possibility of East Timor gaining independence or autonomy from Indonesia and the effect that this might have on the Timor Gap Zone of Cooperation Treaty between Indonesia and Australia. The apparent concession by Indonesia that East Timor will become independent means that the ZOC treaty with Australia may have to be renegotiated. The ZOC area has proved very productive with the producing Elang/Kakatua/Katatua North development and the planned A$2.7bn Bayu/Undan gas/condensate field. (It should be noted, however, that shortly before *Petroleum Review* went to press, it was reported that both the Australian administration and East Timor's pro-independence leaders were indicating that they aimed to abide by the provisions of the existing Treaty. If this proves to be the case, the timetable for the development of Bayu/Undan is unlikely to be delayed.)

The Bayu/Undan project, including a liquids stripping/gas recycling project and due onstream in 2001 with production forecast to peak at 85,000 b/d in 2002, has already experienced protracted delays as partners Phillips Petroleum and BHP Petroleum (which later sold its 42.41% stake to Phillips) endeavoured to agree on a final development plan. The current partners in the project – Phillips Petroleum (50%), Santos (11.83%), Inpex (11.71%), Oryx/Kerr-McGee (11.2%), Petroz (8.25%) and British-Borneo (6.72%) – recently signed an agreement which clarifies the ownership and operation of the field. The project has estimated reserves of 300mn barrels of liquids and 3tn cf of gas. First condensate production – at 115,000 b/d – is now expected in late 2003/early 2004. Gas is to be reinjected until needed at a later date.

Japan

Japan has virtually no indigenous oil and gas resources and is heavily reliant on imports to meet almost all its energy needs. In 1998 its primary energy consumption stood at 499.2 toe, accounting for some 6.89% of world primary energy demand. Despite major efforts to reduce the country's dependence on crude oil, 51.1% of the country's energy requirements was met by crude oil in 1998. Coal accounted for a further 17.7%, nuclear power 16.8%, natural gas 12.5% and hydroelectricity 1.86%.

Japan has continued to diversify its energy balance in recent years, with LNG imports having increased significantly. However, plans to further expand nuclear production (see *Petroleum Review*, February 1999) may not be welcomed by the general public following the country's serious nuclear accident at the end of September when high levels of radiation leaked from a uranium processing plant near Tokyo.

Japan National Oil Corporation (JNOC) assists Japanese oil companies in various oil and gas exploration projects around the world in a bid to help increase the level of Japanese-produced crude oil imports. In 1998, 672,000 b/d of imported crude was produced by Japanese companies, accounting for 15.3% of total crude imports.

JNOC had assisted around 300 companies by end-March 1999, at which time 102 of the companies were still actively involved in the oil and gas sector. Of these 102 companies, 45 were producing, or about to produce, crude oil and natural gas in over 30 countries, while 57 were conducting oil and gas exploration and development work. **Table 1** summarises those E&P projects in which Japanese companies became involved in 1998/99.

Not surprisingly, E&P attention has focused on the Asia-Pacific region to date with 30.4% of JNOC-assisted companies (31) working on projects located in this region in March 1999. A further 14.6% of companies (15) were working on projects in Oceania and 11.7% (12) in the Middle East. JNOC was also involved in 11 projects in North and South America, 11 in Europe, 7 in China, 9 in Africa and 6 in the FSU.

Downstream rationalisation now appears to be developing quite rapidly, starting with the announcement in November 1998 of the merger between Nippon Oil and Mitsubishi Oil to create Japan's largest oil company controlling nearly one-quarter of the domestic market. More recently, the newly merged company launched a $224mn friendly takeover bid for refining company Koa Oil which is 50% owned by Caltex of the US. Nippon Mitsubishi Oil already holds a 5.8% in Koa Oil. The oil giant also recently revealed that it was in talks with Cosmo Oil regarding a potential strategic alliance of their distribution and refining operations. If successful, the merged operation would hold more than 35% of Japan's refining sector.

Country/Region	Japanese Company (% interest)	Area	Licensees (% interest)
1999			
Australia	Japex AC (100%)	AC/P-29	
Azerbaijan	Japan Azerbaijan Oil (100%)	Yanan-Tava Atashkyah Mugan-Deniz	
1998			
Indonesia	Inpex Bunyu (50%)	Sebawang 1	TOTAL (50%)
Kazakhstan	Inpex North Caspian Sea (7.14%)	Offshore	OKIOC
Azerbaijan	Mitsui Kurdashi Exploration BV (15%)	Kurdashi	AGIP 25% TPOC 5% Repsol 5% Socar 5%

Table 1: E&P projects in which Japanese companies became involved in 1998/99

Aussie giants due onstream by year-end

Laminaria and Corallina are the deepest fields to be developed in Australian waters to date. *Jeff Crook* takes a closer look at this development project which produced first oil in November 1999.

The Woodside Petroleum-operated Laminaria and Corallina fields lie on the edge of the Australian continental shelf. Here the seafloor plunges rapidly down into the Timor Trough, where the water depth exceeds 2,000 metres. The fields are located in the Territory of Ashmore and Cartier Islands, administered by the Northern Territory Department of Mines and Energy on behalf of the Commonwealth of Australia. As these are Australian territorial waters, the project was not expected to be directly influenced by the political turmoil in East Timor which is currently over-shadowing the region (see *Petroleum Review*, October 1999), and the fields came onstream, as scheduled, in November 1999.

Development plan

The actual water depth varies over the fields varies between 360 and 420 metres. This is too great for commercial diving, so all subsea installation has been carried out by remote operated vehicles (ROVs) and other diverless techniques. Six production wells and a gas injection well, together with the first stage of the subsea installation, were completed earlier this year.

The second stage awaited the arrival of the floating production, storage and offloading (FPSO) vessel, *Northern Endeavour*, which underwent the final stages of hook-up and commissioning in Singapore in October. Despite the vessel's completion being delayed by some difficulties during hydrostatic testing in the Sembawang yard, production still began on time.

The fields actually lie 550 km west-northwest of Darwin and 160 km south of the Island of Timor. The nearest production facilities are the those of the Jabiru Venture which lies 170 km southwest and the Elang project some 70 km distant in the zone of cooperation between Australia and Indonesia. Support is provided from Darwin in Northern Australia, which results in lengthy supply trips.

A round trip for a supply vessel from Darwin to the offshore facilities takes three days. The long duration of helicopter flights also means that payload can be restricted and that offshore refuelling needs to be arranged for each flight. The lack of support facilities at Darwin also means that there is a need for transport to other national and international centres.

The geologically similar fields lie mainly in block AC/L5. An extensive 3D survey of this block was carried out after the discovery of Laminaria in October 1994 and this showed that the depth of the reservoir crest was 3,160 metres in the Laminaria field and 3,130 metres in Corallina. Woodside says that the reservoir is provided by thick Jurassic Laminaria sandstones sealed by regional extensive Frigate Shale. The oil accumulations are trapped in complex faulted structures.

The fields straddle the boundary of the adjacent WA-260-P license which is 100% owned and operated by BHP Petroleum. A unitisation agreement was concluded in July 1998 after which the Laminaria field stakes were revised to Woodside 44.9250%, Shell 22.4625% and BHP 32.6125%.

In addition to the remote location and deep water, the development plan needed to take account of the soft seabed conditions. As the only development infrastructure in the area, the facilities were also designed with spare capacity for tie-in of possible future finds in the neighbourhood.

Woodside Petroleum, permit operator of blocks AC/L5 and AC/P8, was awarded a production license in February 1997. The company embarked on a A$1.35bn development programme with first oil scheduled for late 1998-early 1999. This schedule proved over-ambitious, although the subsea work proceeded on schedule. The late arrival of the FPSO meant that the subsea installation needed to be carried out in two stages.

FPSO specs

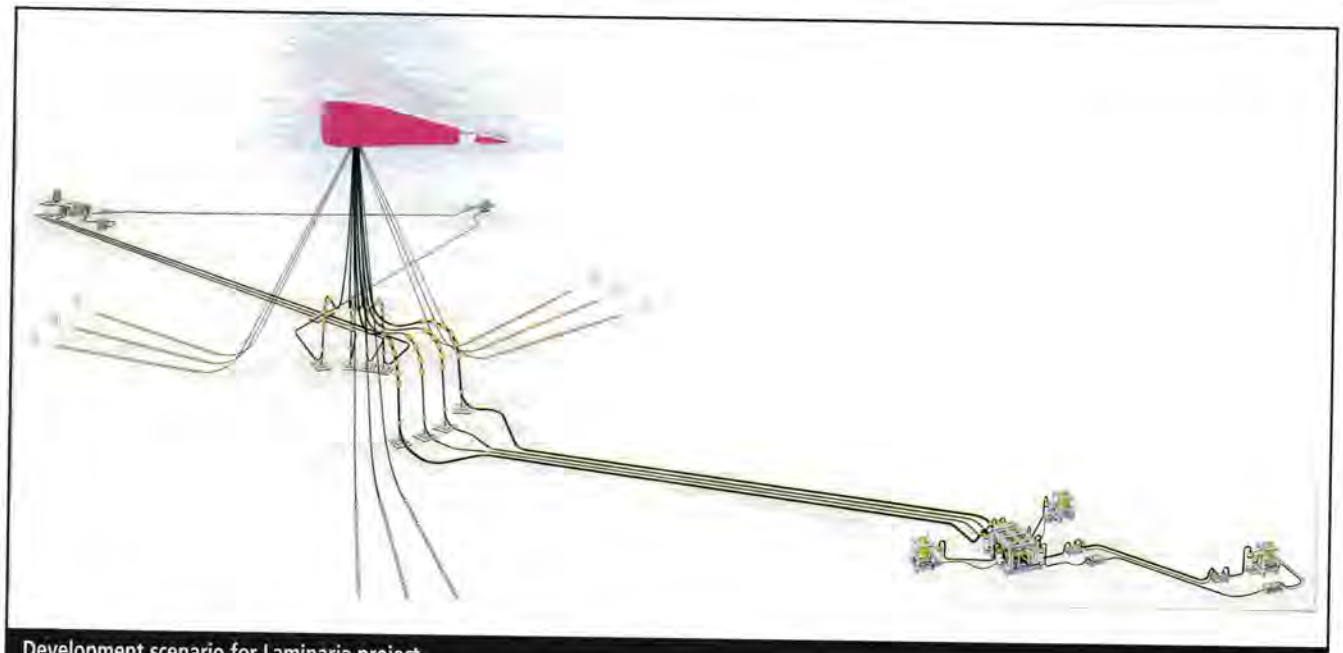
A turnkey contract worth about US$420mn was awarded in December 1996 to a consortium comprising Kvaerner Engineering and Single Buoy Moorings for the FPSO. The FPSO has capacity to store 1.4mn barrels of oil and will be permanently moored between the two fields by means of an internal turret mooring system. The turret mooring system is located at the forward end of the vessel allowing the FPSO to 'weathervane'. The vessel is held in place by nine wire/chain mooring legs each connected to suction anchors on the seafloor.

A suction anchor is essentially a strongly built cylinder closed on the top by a cover plate. It is lowered to the seabed where it sinks into the soil under its own weight. Water is then pumped from the interior of the anchor so that the external water pressure drives the anchor deeper into the seabed. The anchor can be retrieved by reversing the direction of pumping.

Laminaria's suction anchors each weigh 55 tonnes, and measure 5.5 metres in diameter and stand 13.5 metres high. The use of suction anchors was said to reduce the installation time in comparison to traditional piles. However, the decision to use this method of mooring needed to be supported by taking core samples at each of the anchor sites.

The 273-metre long hull of the FPSO was built at the Samsung fabrication yard on the island of Koje, 40 km from the Korean port of Pusan. The hull of the FPSO was floated out of the yard on 23 February 1998, 12 days ahead of schedule. Production and process facilities were installed in Singapore, with final fitting due to take place in Perth, Western Australia.

The processing facilities have capacity to handle a maximum oil pro-



Development scenario for Laminaria project

duction of 170,000 b/d. Initial production from Laminaria and Corallina is expected to reach 170,000 b/d but there will be spare capacity as production levels decline. The 7,700 tonne process facilities will handle produced water, gas compression, gas lift, power generation, cooling water and fiscal metering. A stabilisation column was also included to reduce LPG content and improve the production levels and value of the crude.

Crude oil will be exported by means of a trading shuttled tanker moored in tandem with the FPSO and connected by a flexible loading hose. A vessel will visit every three to four days.

Keeping it in the family

Woodside was pleased that a significant proportion of the work was awarded to Australian industry despite the complex nature of the project. A A$45mn contract covering fabrication of the topside processing modules was awarded to United Construction, who carried out this work at its Kwinana workshop in Western Australia. The modules were shipped to the Sembawang yard in Singapore for installation on the FPSO.

Another A$60mn contract was placed with Coflexip Stena Offshore Pacific for supply of 28 km of flowlines and 3,000 metres of risers. Much of this was manufactured at Coflexip Stena Offshore Asia Pacific's (CSOAP) Freemantle factory. The contract for management, design, procurement and installation of the subsea facilities was placed with Coflexip Stena Kenny, an unincorporated joint venture between CSOAP and J P Kenny.

The FPSO is to be moored between the two fields, which lie 10 km apart. The original plan called for drilling and completion of three subsea production wells in Laminaria and two production wells in Corallina. There were also plans to re-complete one of the Laminaria exploration wells and to drill a disposal well for re-injection of surplus gas. Drilling operations were performed by the mobile drilling unit *Sedco 703*.

Subsea systems

The design of the subsea systems had to facilitate diverless connections on the seabed and also had to take account of the capabilities of the installation vessel *CSO Venturer*. The first stage of subsea work needed to be carried out while the drilling rig was on station last year – the second stage awaits the arrival of the FPSO.

The wells have been drilled in clusters connected back to manifolds containing chokes and control pods. A four-slot manifold has been provided for Laminaria and a two-slot manifold for Corallina. The actual weight of 104 tonnes for the larger of these two manifolds was constrained by the crane lift capacity of the *CSO Venturer*.

The diverless connection had to cope with both rigid and flexible flowlines. The relatively benign environment meant that a 'vertical' connection system could be used, rather than the horizontal system that has been used recently in the harsh environment of the Atlantic Frontier.

Vertical diverless connection systems are used extensively in deepwater oil developments in Brazilian waters. A system of this sort allows a connection to be made by lowering a pipe joints by crane from the support vessel. The design of the pipe joints for vertical systems tends to be complex. However, the operations on the seabed are simpler – (a horizontal system requires pipes to be pulled into place by a winch mounted on an ROV.)

The subsea production system is connected to the FPSO via dynamic risers in a pliant wave configuration. This configuration involves supporting the risers beneath the surface by moored floats. The facilities have been designed with a high degree of flexibility to allow for the tie-in of additional wells and new discoveries in the area. It is anticipated that additional wells will be drilled during the life of the field to optimally deplete the reserves.

Unusual development

A somewhat unusual feature of this project was the award of a maintenance and engineering contract to an external company. This is the first time that Woodside has used an external company to provide maintenance services on an operating offshore asset, although the company recognises that this arrangement is widely used in the North Sea.

An Integrated Services Contract valued at A$35mn (US$22mn) was awarded to Kvaerner Oil and Gas Pacific, based in Perth. The contract extends to August 2002, and utilises the services of an integrated team from Woodside and Kvaerner to provide maintenance and engineering services.

Tough times for tankers

The improvement in the oil market during 1999 has generally been good news for the oil companies but in the tanker business joy has definitely been confined. The high points achieved during 1998 have not been repeated and, although there has been some improvement in the smaller vessel sectors since the middle of the year, earnings for larger tankers have been lower than at any time since 1994.

The tanker market, it should be remembered, is fundamentally dependent on oil trade. The recovery in oil demand growth seen in the Asia-Pacific this year has been welcome but has only gone so far towards soaking up the overcapacity in many sectors of the world tanker fleet. On the downside, the apparent restraint displayed by Opec members in their attempts – so far successful – to support the oil price has curtailed export volumes from the Middle East and has impacted on demand for VLCC (very large crude carrier) and Suezmax tankers, and very large gas carriers in particular.

Worse, rising crude oil prices have translated into increased bunker fuel prices. In combination with the costs of regulatory compliance, boosted this year by the introduction of the ISM (International Safety Management) Code and the provisions of the 1995 revision to the STCW Convention (International Convention on Standards of Training, Certification and Watchkeeping for Seafarers), this has affected tanker operators' bottom lines.

Some respite has been offered by the expansion of underwriting capacity, especially in the Far East, which has allowed some owners to take advantage of lower premiums, and the restriction on Middle East crude oil and LPG exports has raised the opportunity for other trades to take up the slack, some of which have in fact added to overall tonne-mile demand.

Freight margins

The improvement in oil prices has also provided a greater margin for freight. The freight cost that tanker operators can charge traders is naturally limited by the arbitrage margin that traders are seeking to exploit. However, although the higher level of crude oil and product prices this year has provided more arbitrage opportunities, the oversupply of tanker capacity has undermined any power that tanker operators may have felt able to wield.

The world tanker fleet (ships over 10,000 dwt), which had expanded by just 1.9mn dwt in the two years to end-1998, according to data from shipbroker Clarkson, added 4.0mn dwt in the first nine months of this year. Although the rate of scrapping has increased, with more than 10mn dwt hitting the beaches in the first nine months of 1999, it has been insufficient to offset the pace of newbuilding deliveries.

The orderbook has also shrunk, standing at a little more than 40mn dwt – 13% of the fleet – at the end of September, according to broker J Grieg. This compares to 49.4mn dwt at the end of 1998, but this figure was inflated during the first nine months of 1997 by

a frenzy of contracting activity in the optimistic days before the Asian financial crises kicked in later that year.

End-user demand

The impact of the Asian crisis on end-user demand was felt immediately, with oil consumption growth sharply curtailed, both in terms of fuel use and petrochemical feedstock. OECD data show world oil demand rising steadily through to 1997 before 1998 recorded virtually no growth.

Preliminary data for 1999 indicate that oil demand has picked up again, although still under pressure in non-OECD countries. Demand growth for 2000 is forecast to recover to pre-1997 levels.

Newbuilding contracts placed in 1997 were based on expectations that oil demand growth – and the demand for tanker capacity – would continue to expand and that, in particular, the growing economies in southeast Asia would contribute to accelerating trade into the area. Two years after the economic crises hit, world oil demand may be as much as 3mn b/d below what could have been expected.

Moreover, the intervening years have seen the commissioning of new refining and petrochemical capacity in many parts of the Asia-Pacific, leading to a dramatic change in the pattern and volume of trade in crude oil, refined products, LPG, petrochemical gases and easy chemicals throughout the region. For instance, India has become a very important destination for petroleum product exports from the Middle East but five worldscale refineries are due onstream during 1999 and early 2000. Projections suggest that diesel imports into India will cease altogether next year and other product imports will be cut by as much as 50%. India will inevitably have to import much more crude oil but those product tankers which have been working this trade will become redundant. Because of the shortage of deepsea ports in India crude oil imports will be handled by smaller tankers, probably Aframax units, so this will have no impact on the market for larger sizes of tanker.

New refining capacity does not, however, always have such an impact. Plans for new refineries in southeast Asia were also based on forecasts of continually rising demand and there is now spare capacity in some regions. Combined with still-weak end-user demand this has put pressure on margins, especially in Singapore, and, in fact, increased the volume of product being traded through Singapore, where storage tanks have been full all year. As a result, larger product tankers have found additional business moving this spare product both within and out of the region. Over the coming years this spare capacity is expected to be soaked up by rising demand in China. By contrast, spare refinery capacity in Korea has been pounced upon by marketers in Japan, some of whom have closed domestic capacity and are now importing products instead.

Larger vessel sector

None of these trends has helped the larger vessel sectors this year. VLCCs (over 200,000 dwt) are primarily employed on long-haul routes from the Middle East to North America, northern Europe or the Far East. Despite the continued steady rise in US oil import requirements the rise in demand for such tankers has failed to keep pace with the rate of delivery of newbuildings.

Worse may be to come: at end-September the order backlog in the large tanker sector was as high as 23.7mn dwt – equivalent to 19% of the existing fleet. As a result, after some optimism in this sector last year, freight rates have declined fairly consistently through 1999. This decline has been evident not only on the Middle East export trades but also on transatlantic exports from West Africa. So dramatic has been the decline, in fact, that average timecharter equivalent earnings for the first nine months for mid-1970s tonnage were around half of those achieved last year – some $16,000/d compared to $30,200/d for 1998 as a whole, according to data from shipbroker Fearnleys.

Such earnings were, indeed, below those recorded for Suezmax tankers. These units trade overwhelmingly in the Atlantic market, where employment has at least been somewhat more dependable than east of Suez over the past 24 months. However, the weakness in the VLCC market has put additional tonnage into the Suezmaxes' traditional trading areas and here too there has been a sharp fall in earnings. Timecharter equivalent rates for the first three quarters of 1999 were $16,500/d compared to $23,100/d for 1998.

In the same way, excess supply of Suezmax tonnage in the Atlantic market has impacted on the Aframax sector, notably on the crude oil run from North Africa to northern Europe. As a result, despite the comparatively firm level of trade, freight rates in the 80,000 to 100,000 dwt sector have also declined steadily over the course of the year. Fearnleys quotes an average timecharter equivalent rate of just under $12,000/d for the first nine months of 1999 compared to just over $15,000/d for 1998 as a whole. The market for such tonnage east of Suez has been firmer and there has been consistent demand for Aframax-size product tankers in naphtha and condensate business.

Product tanker performance

Of all the tanker sectors, it is product tankers which have performed best – or least badly, at any rate – during 1999. As noted above, the changing nature of refined product trade, arising from the commissioning of new refining capacity, especially in developing countries, has offered a broader spectrum of trading options to such vessels.

The Caribbean market has been particularly strong while long-range product tankers have found ready charterers in the guise of new, export-oriented refinery capacity in the Middle East. Certain indicative routes have shown an improvement in rates during 1999. This has been particularly true for clean products in the Caribbean market and for mid-range vessels east of Suez.

By contrast, while there have been occasional spikes in the market, the overall freight rate trend in the Atlantic dirty products trade has been downward.

Chemicals and LPG markets

Things have been no better in the chemical tanker sector where, despite some increase in tanker demand since mid-year, rates have failed to respond significantly. The chemical tanker market also suffers from severe over-capacity and the orderbook remains worryingly large.

The situation contrasts sharply with the LPG tanker sector where, perhaps because of the high degree of concentration of ownership, great restraint has been shown in newbuilding contracting. The first half-year continued the downward trend in earnings from 1998 in all gas tanker sectors, but since the middle of this year, rising vessel demand has translated more readily into improved earnings for operators.

Facing the future

The benefits being reaped now by gas tanker operators should provide a lesson to those in other sectors. The mainstream tanker market looks highly overtonnaged and is likely to remain so for some time yet. Nevertheless, new orders continue to be placed, largely because low newbuilding prices are being quoted and there is money available from lenders.

Without some degree of self-control, tanker owners are likely to buy themselves into a depressed market in the medium term. Even as things are it is hard to see earnings in the larger tanker sectors showing any significant improvement within the next two years at the very least.

Increasing loyalty through customer-focused development

During the 1990s, ever-increasing price competition in fuel retailing has caused the margins achievable on fuel sales to fall dramatically. In the more mature markets, competition has increased because of the penetration of new entrants such as hypermarkets; in the less mature markets because of deregulation and increased liberalisation. Whatever the reasons, with price competition here to stay and fuel volumes likely to be stagnant over the next five years, the western European service station sector will continue to present a very challenging environment for the foreseeable future. William Keast-Butler, Energy Analyst at *Datamonitor*,* reports on how operators are striving to increase throughputs per site and encourage higher customer loyalty in order to ensure future profitability.

In order to accomplish these aims, companies are drastically rationalising networks, looking to streamline customer service and secure competitive advantage through new technologies. Between mid-1994 and mid-1998, the overall service station network in western Europe shrank by 10,351 sites. By mid-2003, Datamonitor forecasts a further 14,745 sites will have been closed. In order to 'fill the gaps' left, companies are also looking to open up new distribution channels such as unmanned sites. Furthermore, the process of rationalisation has facilitated the massive expansion of the forecourt shop – increasingly seen as the service station profit centre – and is being backed up by heavy investment in promotions and in particular, loyalty programmes.

Importance of branding

Customer perceptions play a critical role in any retail business, particularly in the service station sector due to the similarity of the offerings of the oil companies in terms of fuel quality and fuel price. It is upon the customer perception of value-for-money that hypermarkets have so successfully penetrated the UK and French markets, and it is upon customer perceptions of quality and service that many of the oil majors hope to safeguard their market shares.

Brand building is essential in leading such customer perceptions, and in the case of oil companies brand building is highly complex. This stems from the integrated nature of the companies, which means that the service station brand is one section of a far larger corporate brand. This can cause problems – for example, Shell service sta-

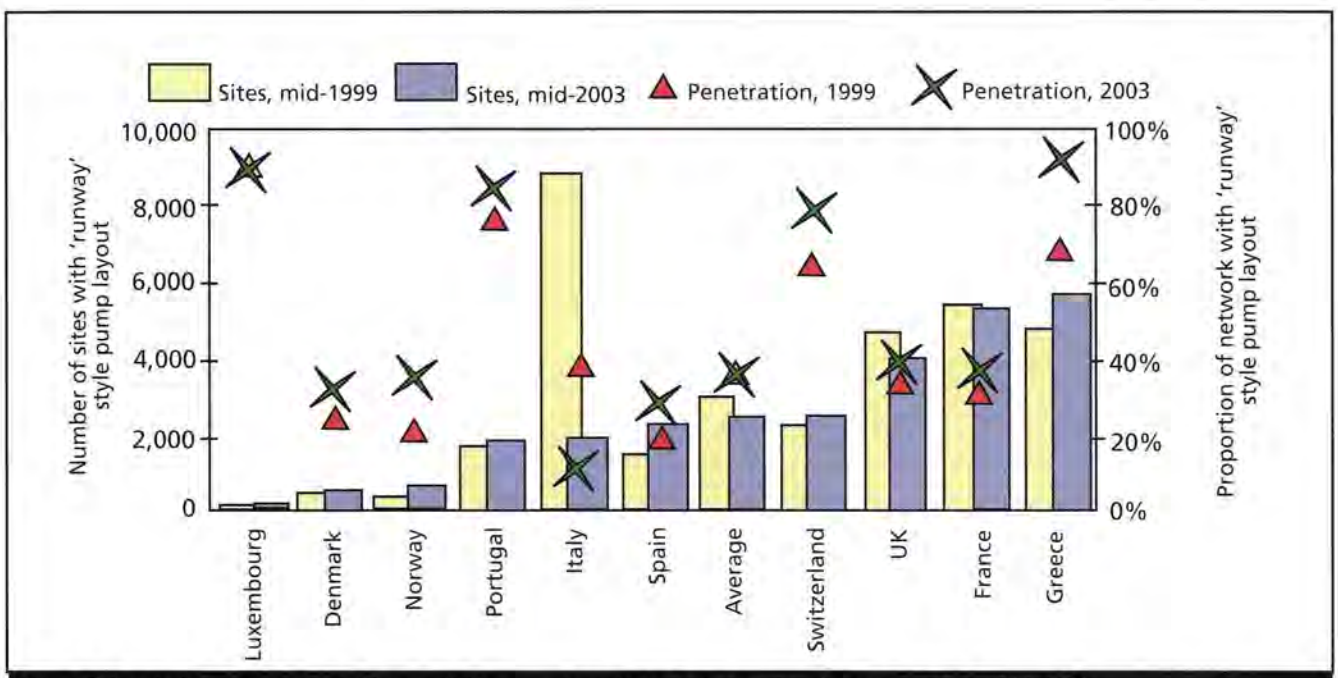


Figure 1: Penetration and numbers of 'runway' style pump layouts in selected western European markets, 1999–2003
Source: Datamonitor

tions were unable to disassociate themselves from the Brent Spar disposal controversy and thus suffered considerable loss of revenue in certain areas.

The importance of brand building rests upon the fact that as the forecourt shop develops across western Europe and competition increases, the best way to ensure sustained profitability is to encourage customer loyalty. This is especially problematic in forecourt retailing, as customers are highly likely to choose which service station they visit simply on the basis of location. Further problems stem from the difficulties in maintaining a consistent brand due to location and the contractual set-up of the site, which might limit the amount of control exercised by the company.

Traditionally, oil companies have built their brand images based on quality, both in terms of fuel and service. However, such branding carries the problem that often customer perceptions equate high quality with high prices. Thus, especially in countries with a high degree of hypermarket penetration, a process of re-branding has begun. The theme of much of this re-branding has been to promote factors such as modernity, quality, technology and value for money. Examples of this include Fina, which has started the process of transforming the image of its entire European network, and Repsol, which at the beginning of 1998 revealed its new style of service station which has been designed by Sir Norman Foster.

Creating loyalty

In order to maintain their share of fuel sales and operational profitability over the next five years, fuel companies can adopt one of two major strategies. One is to offer product at consistently low prices, the other to increase loyalty through customer-focused development. In recent years it has become increasingly difficult to maintain consistently low prices as the entrance of new players such as hypermarkets has led to the virtual disappearance of margins. As a result the dominant strategy across much of the continent is certain to centre around increasing customer loyalty.

This strategy has already been widely adopted by the industry as a fundamental counterpart to network rationalisation. Companies have converted much of the savings from closing unprofitable low-volume sites into investment for the rest of their networks. Within this though, the dominant focus has been placed upon the forecourt shop. This will obviously still be a key area up to 2003. However, there will also be a definite shift towards customer-focused technologies, especially those designed at speeding the customer through the fuelling process.

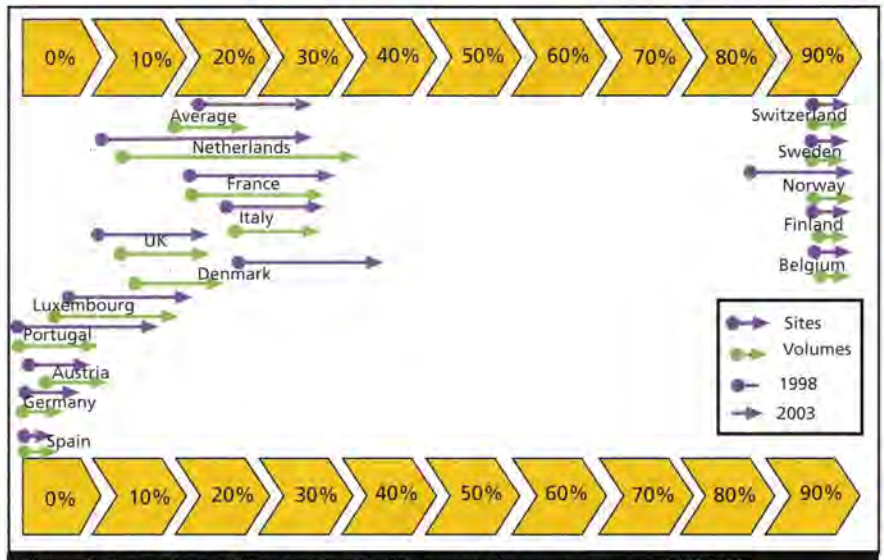


Figure 2: Proportion of sites equipped with pay-at-the-pump systems, 1999-2003
Source: Datamonitor

Customer-facing pump layouts

A central theme within the process of rationalisation has been to convert savings from closures into investment in the rest of the network. Network rationalisation has gone hand-in-hand with the process of network modernisation.

In the last five years several companies have included as a part of network modernisation an overhaul of their pump layout, most often replacing traditional two-by-two and two-by-three layouts with 'runway' style layouts. The obvious intention of this is to reduce the time it takes a customer to fuel, which in turn should lead to both higher levels of loyalty and higher volume throughputs.

As part of its 1999 survey of key executives from oil companies, Datamonitor gathered estimates for the proportion of sites in national networks that were provided with 'runway' style pump layouts. The data is presented in **Figure 1**. In 1999 Italy will have the largest number of sites (8,862) with 'runway' style pump layouts. However, this reflects a penetration rate of just 35%, far lower than in countries such as Luxembourg, Portugal and Greece where the penetration rate is likely to be 90%, 77% and 70%.

In the case of Luxembourg this is unsurprising as this is the highest volume throughput market in the region. Conversely, the high figure for Greece is somewhat surprising as the market has the lowest volume throughput in western Europe. However, the Greek figures are somewhat deceptive in that there are many small-scale sites with as few as two pumps and thus qualify as 'runway' style layout sites.

Whilst the penetration of this style of pump layout currently varies considerably across the region, in almost every country the proportion of sites with runway style layouts will increase significantly by 2003. The only exception will be Italy, where over the next five years the focus of companies will be upon developing non-fuel revenue streams. In order to achieve this they are likely to minimise the site space taken up by the pump area so as to facilitate expanding the forecourt shop offering.

Pump technologies

Dramatic growth is also expected in the penetration of pay-at-the-pump systems as a direct result of companies looking towards facility provision to provide competitive advantage (see **Figure 2**). At present, just over 25% of western European service stations are now equipped with pay-at-the-pump systems, accounting for 20% of fuel volumes sold. By 2003, this technology is forecast to be present in 35% of sites, accounting for 27.4% of total volume sales.

By 2003, pay-at-the-pump systems are forecast to account for all the fuel sold in Switzerland, Sweden, Belgium, and 99.2% and 96.5% of fuel sales in Finland and Norway. The high penetration of these systems in Scandinavian countries is due to the fact that payment cards dominate the retail sector. Furthermore, in all these countries there is a high proportion of unmanned sites, which necessarily use these facilities.

At the opposite end of the spectrum, there will be no sales through sites equipped with these facilities in Eire,

Greece, Spain and Portugal, whilst in Luxembourg and Austria penetration is likely to be under 10%. This is a reflection of the relative immaturity of these markets. In these markets the focus over the next five years is likely to be on developing the forecourt shop, rather than on investment in customer-facing technologies.

Growth in unmanned sector

For western Europe as a whole, 6.1% of the service station network in 1999 is expected to consist of unmanned sites, accounting for 3.9% of sales. In 2003, unmanned sites are forecast to account for as much as 9.2% of the network, whilst some 5.8% of sales will go through them. This strong growth in the unmanned sector will be driven primarily by the need to serve rural customers where it is not financially viable to operate manned sites. This is evidenced by the example of Norway, where the unmanned share of sites is forecast to increase from 5% in 1999 to 15% in 2003. With a relatively dispersed population, Norway is an ideal candidate for a high penetration of unmanned sites.

In 1999 Datamonitor estimates that Sweden will have the highest volume of sales through unmanned sites – 1,963mn litres. This compares to a western European average of 591mn litres. The three next largest markets will be Italy, Switzerland and Finland with volume sales through unmanned sites of 1,794mn litres, 1,762mn litres, and 1,469mn litres, respectively. The four largest markets will account for 69.6% of total western European unmanned volume sales in 1999. In 2003 the situation will be similar with these four markets continuing to have the greatest volume of unmanned sales, equivalent to 64.2% of total western European unmanned volume sales.

Non-fuel sales profitability

With companies increasing the emphasis placed on non-fuel offerings and customers becoming ever more accustomed to using the forecourt shop for convenience shopping, the sector continues to have scope for massive expansion.

The contribution made by the non-fuel sector will increase in every country in western Europe between now and 2003, although to varying degrees. This represents a continuation of the trend over the last five years. As the mature markets see margins on fuel shrink, companies increasingly look to the forecourt shop to ensure operational profitability. In less mature markets, the forecourt shop is also becoming more important as customers become acquainted to the concept of convenience shopping at the service station. The only market not expected to see an increase both in the non-fuel proportion of turnover and of profits is Denmark, where the proportion of turnover will decrease slightly as the sector reaches maturity.

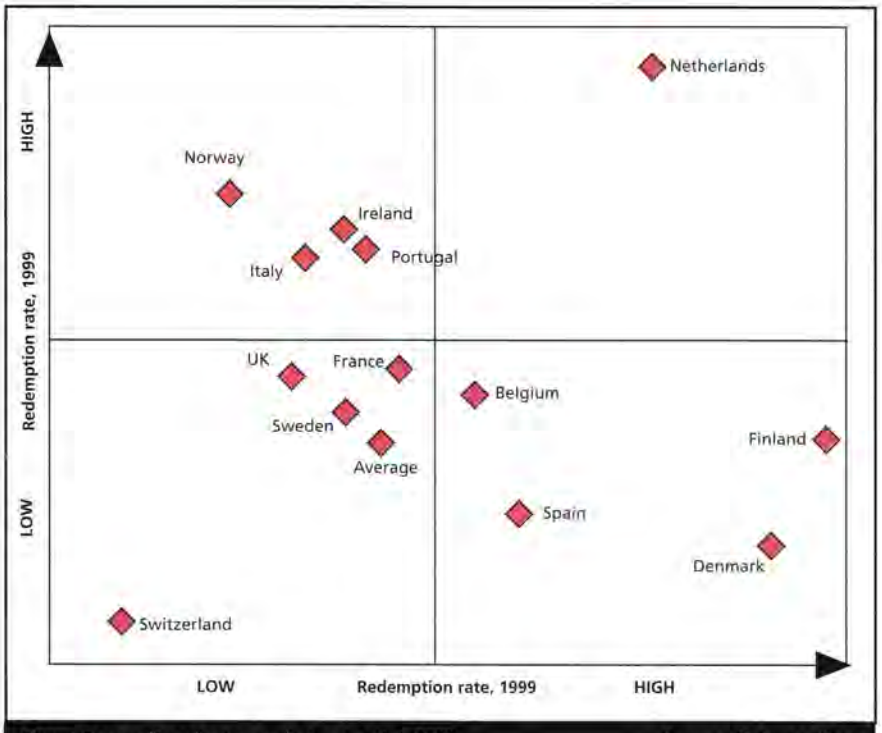


Figure 3: Loyalty scheme market potential, 1999 Source: Datamonitor

Loyalty schemes

In 1999, only 34% of points awarded as part of fuel retailing loyalty schemes in Europe will actually be redeemed, demonstrating that two-thirds of customers who collect loyalty points are unlikely to show increased levels of loyalty. However, this is not to say that loyalty schemes do not represent a good opportunity for retailers wishing to tie-in customers. Both the penetration of loyalty schemes and redemption rates of loyalty points vary greatly between different European countries.

Figure 3 identifies which national markets offer the best opportunities for companies planning to invest in a loyalty scheme, by comparing loyalty scheme penetration and redemption rates. Markets appearing both in the lower right and upper left quadrants demonstrate the most potential for loyalty schemes. Markets with high penetration and a low redemption rate offer opportunity as customers are collecting loyalty points but not redeeming them – implying that a scheme that offered something more than those currently in operation would be likely to attract interest. Conversely, markets with a high redemption rate and low penetration offer opportunity as there is scope for growth and a customer base that has already demonstrated a degree of loyalty.

The road ahead

The European service station sector will continue to present a challenging environment over the next five years. Demand will remain stagnant, price competition fierce, and margins will struggle to rise above their present minimal level.

The companies to succeed under these pressures will be those which rise to the challenge and implement a range of customer-focused technologies to boost customer loyalty and maximise sales in the non-fuel sector.

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Look north to see the future

Finland has used its Presidency of the European Union (EU) to promote regional energy cooperation and supply diversity. The Baltic region – with its strong environmental commitments – offers pointers for other countries, reports *Chris Skrebowksi,* recently in Helsinki.

As befits a highly Internet-enabled country, Finland's Presidency of the EU has been backed up by a very comprehensive website at **www.presidency.finland.fi** In addition, the Ministry of Trade and Industry website – **www.vn.fi** – provides further data.

At the end of October, the 2nd Conference of Ministers of Energy on Cooperation in the Baltic Sea region was held in Helsinki. The conference was part of the ongoing process of voluntary energy cooperation in the Baltic Sea region (BSR) which started with the 1997 Bergen declaration of Nordic Prime Ministers. This initiative was then followed by Finland's Northern dimension initiative (1997) and the EU Commission's Baltic Energy Task Force initiative (1998). The overall aim of the various initiatives is to promote regional cooperation and economic/environmental sustainability.

The first Energy Ministers conference was held in Stavanger. It set up a number of working groups which then reported progress to the second Energy Ministers conference in Helsinki. In addition to the steering group, other groups include:

- Gas – the lead partners being Russia and Germany, with seminars held in St Petersburg and Berlin.
- Electricity – the lead partners being the EU Commission and Estonia, with seminars held in Hannover and Tallinn.
- Climate change and flexible mechanisms (emissions trading etc) – the lead partners are Sweden and Lithuania, with a seminar held in in Malmö.
- Combined heat and power (CHP) and energy efficiency – the lead partners being Denmark and Poland, with a seminar held in Copenhagen.

The main decisions made at the Helsinki conference were to continue to develop the voluntary energy cooperation in the BSR by encouraging and facilitating investment in CHP, pipelines and power grid lines. Steps are also to be taken to develop the BSR as a testing ground for pollution trading and other flexible mechanisms to meet environmental and emissions goals.

Similarly, moves are to be made to integrate the electricity market in the BSR and to promote the development of a gas grid to enhance regional access to gas supplies and improve supply diversity. Energy officials of the various countries making up the BSR – Finland, Norway, Sweden, Russia, Estonia, Latvia, Lithuania, Poland, Germany, Denmark and Iceland – are already working closely together on the various initiatives.

Gas

Gas is seen as having a major role to play in the BSR, largely because of its ready supply availability and environmental attractions. The region has wide variations in terms of gas supply and infrastructure. The basic policy, however, is to rely on market mechanisms, restricting government actions to ensure a level playing field.

The key gas suppliers are Russia and Norway, while Denmark is self-sufficient. Supply infrastructure is well developed in Denmark, Germany and the Baltic countries, but relatively undeveloped in the other BSR countries. The principal concerns are the likely increasing dependence on Russian supplies and the fact that Finland, Sweden and the Baltics have only one gas supply source. A number of pipeline projects are likely to affect regional supplies and a number of studies have been made to assess their possible impact. The recently completed Fortum study – *Northern Dimension Gas Study: Final Report* – is one evaluation of the various proposals (see map).

Electricity

The major goal is the progressive harmonisation and interconnection of the various national electricity grids into the Baltic Ring. As well as the technical issues associated with interconnection of grids, the harmonisation of legal and administrative structures is needed to reach the goal of consumers having freedom of choice in electricity purchase.

Climate change

It was proposed at Stavanger that the BSR could form a testing ground for efforts to develop energy trade while fulfiling the commitments of the Kyoto Protocol. The region has the advantage of wide variations in carbon emission intensities and considerable variations in fuel mix. The resulting cost differentials provide attractive opportunities for energy and emissions trading. Integrating and opening energy markets will help to develop these activities.

Efficiency

A combination of severe climate conditions and historic commitments to environmental protection means that the BSR countries, particularly the Scandinavian members, have a very strong, practical commitment to the efficient use of energy. The highest usage of CHP, district heating and renewables (mainly hydropower, timber and wood processing wastes) are to be found in the region along with some of the highest insulation standards. The interchange of these competencies is seen as a key part of developing regional energy supply systems with the highest efficiencies and the lowest environmental impact.

Existing and potential gas pipeline links
Source: Northern Dimension Gas Study, Fortum

New self-sealing clamps for online pipeline repair

A new range of FurmaSeal self-sealing repair clamps (SSRC) has been launched by Furmanite. Specifically designed for quick and economical online pressure leak repair without requiring welding or shutdown, the split sleeve fittings can be attached to any section of existing pipeline for repair or reinforcement without interrupting operation, states the company.

No welding is necessary as the near-tangential bolting compresses the elastomer packing seals around the pipe at both ends of the clamp and between the two clamp halves to produce an effective and mechanically-actuated, high integrity pressure vessel.

Furmseal hot tapping and plugging tees can be used to tie-in branches and give temporary isolation while operation continues. Seal integrity can be simply verified by pressurisation of the annulus between the clamp body and pipe, says the company.

The clamps are precision machined to ensure full width face-to-face contact which, with the near-tangential bolting, is claimed to virtually eliminate bending and distortion.

In addition to standard sizes and pressure ratings, specifically engineered bespoke clamps can also be provided, including extended seal lengths, high pressure ratings, and tailored configurations including tees, elbows, flanges and valves. Remotely-installable, ROV-compatible versions requiring no manned intervention are also available for hazardous applications, including deepsea, nuclear and toxic environments.

The clamp designs have been hydrostatically tested to 1.5 times the design pressure and will contain the pipeline contents to the specified working pressure, states the manufacturer. They are equipped with vent ports, and hinges where appropriate.

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Automatic hyperbaric welding first for Coflexip

Coflexip Stena Offshore Ltd (CSOL) reports that its new automatic hyperbaric welding system has successfully completed its initial weld on the Elf Exploration-operated Elgin/Franklin field in the North Sea.

The 5.2-km interfield pipeline bundle has been designed to operate at temperatures up to 160°C and 150 bar, which represents some of the most challenging high pressure/high temperature (HP/HT) conditions to be encountered in the region to date. The flowlines are internally lined with a corrosion-resistant alloy and externally covered with a special insulation material to restrict heat loss and maintain inlet temperature at the Elgin platform.

The CSOL automatic hyperbaric welding system – developed specifically for the Elgin/Franklin project and said to be the first newly designed system for the North Sea in 10 years – is computer controlled and operated from the surface by technicians, although divers are still required to set up the 'butt'. The new-build hyperbaric habitat is designed to accommodate vertical welds at the base of the Franklin riser caisson and horizontal welds between spools and the bundle. For riser welds, the habitat was cross-hauled into position using the *CSO Orelia* vessel crane and platform controlled winches. After the riser welds, the habitat is to be split and recovered in two halves.

According to the company, the system offers 'considerable savings on qualification costs, as the majority of qualifications can be performed at the new Westhill atmospheric chamber test centre'.

The system is also claimed to improve the quality of welding while ensuring diver safety in a hyperbaric environment.

Tel: +44 (0)1224 744044
Fax: +44 (0)1224 744038/9

Flame detection

The second-generation Det-Tronics X3300 infrared optical flame detector is designed to sense the smallest fires in process or production facilities, indoor and outdoor plants, oil refineries and offshore platforms. For example, it can sense a 0.1m² gasoline fire at distances over 60 metres, states the manufacturer.

Measuring under 15 cm x 8 cm, the detector is said to be easily retrofitted and requires a low level of maintenance.

Tel: +44 (0)1753 683059
Fax: +44 (0)1753 684540

NEWS Technology

New density transmitter for closed-loop control

Solartron has unveiled an explosion-proof digital insertion density transmitter which is said to offer 'significant' cost savings to process engineers. A wide range of density-derived values – including °API and % solids – are continuously computed within the transmitter, eliminating the need for remote processing. Any computed value is available via the unit's industry-standard 4–20mA output for controlling valves, mixers, blenders, etc, while Modbus communications facilitate integration into SCADA and DCS systems.

The Solartron 7828 uses a vibrating tuning fork element to measure the density of liquids, varying from ultra-light hydrocarbons to heavy slurries. It is claimed to maintain an accuracy of 0.001g/cc across wide temperature and pressure variations, and in the presence of transient bubbles and solids. The transmitter is mounted directly in the pipeline, bypass or tank wall, with the tines of the tuning fork fully immersed in the liquid.

The system includes versions suitable for a range of corrosive environments or demanding hygiene standards. Designed for use with liquids and slurries in pipeline, stream and tank applications, the transmitters are totally self-contained and factory-callibrated for easy installation and set-up. The 'fit and forget' sensors require no routine maintenance, states the manufacturer.

A portable PC can be connected to the Solartron system, allowing an engineer to check that it is functioning correctly or log data for later analysis. Software supplied with the transmitter also allows the engineer to reconfigure the stand-alone density transmitter when setting up unique conversions.

Tel:+44 (0)1252 376666
Fax: +44 (0)1252 543854

Multiphase pump first for North Sea

TotalFina (33.33%) and partner Elf Aquitaine (66.67%) claim to have introduced new technology in the UK North Sea with the installation and start-up of multiphase pumps on the Dunbar platform. The 'rotodynamic' multiphase pumps – developed in partnership with the Institut Français du Petrole (IFP) and Statoil – are designed to increase production by enabling simultaneous liquids pumping and gas compression of the commingled wellhead production. This type of pump is said to simplify production facilities by reducing the amount of equipment required in a conventional arrangement.

Two electrically-driven multiphase pumps, 4.5 MW each, were installed on the Dunbar platform in July. They will deliver a flow of 40,000 b/d of liquids and 3mn cm/d of gas, accelerating oil and gas production from the Dunbar platform and increasing economic reserves from the oil and gas reservoirs of Dunbar and its Ellon and Grant subsea satellites, states TotalFina. Production from these fields will be transported by a single multiphase pipeline to the Alwyn platform, located 22 km to the north, for treatment before transportation to shore.

Tel: +44 (0)1224 858356
Fax: +44 (0)1244 858019

UK and Irish UPP deal

PetroTechnik has launched a new link-up with Hytek giving it sole UK and Ireland distribution rights for PetroTechnik's UPP underground flexible pipework system for service stations. The deal will allow installers to source the UPP system as part of a complete range of forecourt and fuel delivery products from a single supplier.

Tel: +44 (0)1449 722822
Fax: +44 (0)1449 721821

Liquid flow meter

EMO has extended its range of liquid flow meters to incorporate an ultrasonic model for single and multiphase measurement of flow rate and volume, with a facility for batching. The units are claimed to cost a fraction of comparable non-intrusive models and are said to be compact, easy to install and reliable (with no moving parts). Capable of monitoring both clean and dirty fluids, the meters can be left in situ and the head readily removed for maintenance purposes.

Tel: +44 (0)161 643 3681
Fax: +44 (0)161 655 3785

Enhanced transmitter

The newly enhanced Model 3095 MV transmitter from the Rosemount measurement division of the Fisher-Rosemount group effectively acts as three transmitters plus a flow computer in one complete package.

The package unites four different measurements in one device, covering differential pressure, static pressure, and process temperature to dynamically calculate fully compensated mass flow. The transmitter then provides a 4–20mA signal proportional to mass flow that can be used for control or metering purposes. Capable of handling steam, gas or liquids, the unit is claimed to display 1% of rate accuracy over an 8:1 flow range.

The device is also suitable for use with a wide range of primary elements, tap configurations and line sizes. According to the manufacturer, the transmitter's single mounting hardware and single run of a twisted pair provides installation saving of up to 42%. Other benefits are said to include less commissioning of labour and an 80% reduction in fugitive emission points.

Tel: +44 (0)1243 863121
Fax: +44 (0)1243 845280

NEW Publications and Data Services

Benchmarking in the Process Industries

Munir Ahmad (IChemE Book Sales, 165–189 Railway Terrace, Rugby CV21 3HQ, UK). ISBN 0 85295 411 5. 155 pages. Price (hardback): £45.

This publication describes how to measure and benchmark the manufacturing performance of a process plant as a first step on the journey to performance and competitiveness improvement. Based on the practical experience of over 200 process plants, the book gives guidance on how to benchmark, where to find the benchmarks, how to quantify the gaps intended and suggests the impact of improving manufacturing in the process industries. It provides the framework, measures and industry world-class targets to allow organisations to maximise their potential.

Advanced Process Control and Information Systems for the Process Industries*

Editor: Les A Kane (Gulf Publishing Company, Book Division, PO Box 2608, Houston, Texas 77252-2608, USA). ISBN 0 88415 239 1. 338 pages. Price (hardback): $75.

This guide provides an overview of the latest developments and new technologies in the field of process control and information systems in the process industries. Topics covered include: project justification and implementation; model-based control; online optimisation; plant information systems; and frontline control. The book presents a number of case studies, along with details of techniques and guidelines that have been proven in industrial installations. Each chapter is based on specially selected articles from *Hydrocarbon Processing* magazine.

Handbook of Petrochemicals and Processes*

G Margaret Wells (Ashgate Publishing, Gower House, Croft Road, Aldershot, Hampshire GU11 3HR, UK). ISBN 0 566 08046 X. 508 pages. Price (hardback): £95.

This book provides up-to-date information on 76 petrochemicals and their processes, giving details of the chemical reactions involved in transforming raw materials, such as olefins and aromatics, into chemicals, plastics and synthetic fibres. The competing processes for each product, including the latest technical developments are described, with their feedstock requirements, catalysts and conversion rates compared. Many of the processes are illustrated with clear flow diagrams. Details of the physical characteristics and properties, grades available, handling; transportation, health and safety aspects, and lists of the major manufacturers and licensors are included within each chapter on the individual products.

Online Information Library

The Society of Petroleum Engineers (SPE) has reduced the price of its Online Information Library (OIL) service – an online technical paper database that allows users to browse through more than 30,000 technical papers, purchase and download them online, 24 hours a day, seven days a week. Prices for members have been reduced from $10 to $5 and for non-members from $14 to $10. OIL is part of SPE Online, a complete package of online services available through the SPE website (**www.spe.org**). SPE Online also includes Technical Interest Groups (TIGs), distance learning, Internet career centre, and in-depth information on Society meetings and conferences.

** Available for reference only from the IP Library*

Drilling Data Handbook

G Gabolde and J-P Nguyen (Éditions Technip, 27, rue Ginoux, 75737 Paris Cedex 15, France). ISBN 2 7108 0756 4. 552 pages. Price: FFr 530 (euro 80.80).

This seventh edition has been updated to reflect changes that have occurred in drilling techniques over the past decade. New specifications and recommended practices have been published by the American Petroleum Institute during this period, while manufacturers have greatly improved their equipment and made remarkable progress in a number of fields including horizontal drilling and coiled tubing. The handbook provides an overview of drill string, casing and tubing line pipe standards; capacities and annual volumes; drilling bits and downhole motors; hoisting and derrick floor equipment, and drilling muds. It also looks at developments in cementing, directional drilling, kick control fishing and wellheads.

Unsteady-State Fluid Flow: Analysis and Applications to Petroleum Reservoir Behavior

E J Hoffman (Elsevier Science, PO Box 211, 1000 AE Amsterdam, The Netherlands). ISBN 0 444 50184 3. 486 pages. Price (hardback): euro 238.23 ($266.50)

This publication presents introductory information about petroleum-bearing formations and fields, reservoirs, geologic codes, and empirical methods for correlating and predicting unsteady-state fluid flow behaviour. It also provides a more theoretical presentation of the phenomenon based on the classical partial differential equations for flow through porous media.

Motor Vehicle Emission Regulations and Fuel Specifications: Part 1*

(Available, free of charge, from CONCAWE, Madouplein 1, 1210 Brussels, Belgium). 12 pages.

This report (no. 9/98) summarises changes in worldwide legislation and regulations governing motor vehicle emissions, fuel specifications and fuel consumption. It details both current and pending legislation on emissions limits, emissions testing, vehicle inspection and maintenance programmes, as well as legislation aimed at controlling in-service emissions performance, fuel consumption and carbon dioxide emissions. The report should be read in conjunction with Part 2 (report no. 6/97) which was issued as a separate volume in 1997. The second part of the report provides similar information on a historical basis and covers in some detail many aspects of the topics covered in Part 1. It is intended that Part 1 will be updated annually, while Part 2 – a comprehensive reference document – will be revised at appropriate longer term intervals.

Oil Price Economics: A Field-by-Field Breakeven Analysis

(FT Energy, Maple House, 149 Tottenham Court Road, London W1P 9LL, UK). ISBN 1 84083 188 X. 94 pages. Price: £750 ($1,200; euro 1,050).

This report, jointly produced by FT Energy and the Wood Mackenzie consultancy, assesses the effect of low oil prices on oil and gas production around the world. It analyses fields with total current production of over 26mn boe/d and potential new field developments with total reserves of over 23bn boe. Providing invaluable insight and analysis into breakeven economics and the impact of various oil price scenarios on new development activity, the publication helps the reader to assess the impact of oil prices on future production and capital expenditure.

Membership News

NEW MEMBERS

Mr A Adams, Wilmslow
Engr A Al-Subaiyel, Saudi Arabian Oil Company
Mr S Alderson, Van Ommeren Tank Terminals
Mr S F Allen, QCL International
Mr C P Assi, Nottingham
Mr I C Balat, Le-Gor Energy Offshore SA
Ms L K Beddowes, Schneider Electric
Mr M Birchall, Billericay
Mr J E Brocklebank, BP Amoco
Mr W Buckley, Southfleet
Mr J Burgess, Aylesbury
Dr T D Burnett, Maidenhead
Mr D C Chisnall, Gibb Limited
Mr M Christensen, Lintec Group Limited
Ms L Cowie, Schneider Electric
Ms K E Daly, Choicedrill Limited
Mr S K Day, Basingstoke
Mr D Divers, Procon Drilling Services
Mr S G Dougal, Chart Shipping Limited
Mr A J Farrington, Richmond
Captain J Fawcett, Falconer, Bryan & Associates Pty Limited
Mr T J Ferrand, Warburg Dillon Read
Ms A A Finlay, Northern Environmental Management
Mr G M Goody, GMG Services
Mr G J Greig, Chevron (UK) Limited
Mr J W Guest, Tonbridge
Mr P J Heath, Heath & Spearing
Mr S J Holden, Gainsborough
Dr L Johnman, University of Westminster
Ms L Johnson, London
Dr G Lakatamitis, West Bay Petroleum Co
Mr P A Lawrence, USA
Mr D S Lee, London
Mr D H Levy, Noble Denton Europe
Mr E M Lilley, Merseyside
Mr E J Lynch, Ove Arup & Partners
Mr A K Macleod, ABS Europe Limited
Mr A McHugh, Glasgow
Mr P J Moore, Boston Putford Offshore Safety
Mr R Nair, Saybolt Saudi Arabia Limited
Mr A T Pham, Falconer, Bryan & Associates Pte Limited
Mr S S Rai, Texaco North Sea (UK) Limited
Mr R Sax, Cheshire
Mr B Shah, Royal Bank of Scotland plc (The)
Dr C W Skipper, HR Wallingford Limited
Mr G Smith, Bayford Anglia Limited
Ms A Tallents, Upstream Law
Mr H Thyssen, Seabulk Offshore SA
Mr R D Underwood, Aberdeen
Mr J G M van Glabbeek, Netherlands
Mr Y Voicehovsky, European Bank for Reconst'n & Dev
Ms K Walsh, GeoDelft Environmental

NEW STUDENTS

Mr M Aslam, Cardiff
Mr R K Al-Yazidi, Imperial College
Mr A N Albitawi, Sheffield
Mr M A Baharudin, London
Mr L Bozzoni, London
Ms S Daungkaew, Imperial College
Mr I Dimitros, Hants
Mr G O Falope, London
Mr C Gossart, Brighton
Mr D A Graves, Imperial College
Mr P G Hadjipieris, Imperial College
Ms E O Ibru, London,
Ms A Johnson, Bradford
Mr M Jurganawczynski, London,
Mr D Kanashev, Dundee,
Mr D R Stokes, London
Mr P Sunden-Cullberg, Imperial College
Mr W H Tham, London
Mr N Tsirigotis, London
Mr S M J Uddin, London
Mr P R B Wade, London
Ms L A Welbon, Imperial College
Dr M Wisniak, Ashford

NEW FELLOWS

Mr K Blizzard FInstPet
Keith Blizzard, a Director of Blizzard & Associates Limited, is a Chartered Quantity Surveyor, Project Manager, Cost Engineer, Arbitrator, Adjudicator and University Lecturer. With company bases in Birmingham, Gloucester and Northampton, he combines his professional and legal work in the variety of tasks the company undertakes for a broad range of clients, including the major petrol companies, throughout the UK.

Mr A B Smithers FInstPet
Brian Smithers is employed by BP Amoco Oil as a Senior Environmental Advisor. A graduate in Control Engineering, he has been involved for over 15 years in air pollution issues, with particular emphasis on gasoline vapour recovery. He has been Chairman of the Vapour Recovery Panel (DOC-4-D) since it was formed. In this role he has actively supported the Institute during the development, interpretation and implementation of the EU 'Stage 1' Directive.

Mr P Smith FInstPet
Mr Smith is Health and Safety Officer for Van Ommeren. His responsibilities are for all the implementation of safety, quality environment for both the Van Ommeren terminals at London and Purfleet. He is also responsible for maintaining the terminals fire fighting equipment, planning and organising the training requirements for all employees and the management of the terminals security measures. He is an active member of the Essex branch and was Manager for the successful 1994 British Mount Everest Medical Expedition and the 1998 Kanchenjunga expedition.

Mr Duaij Y Al-Anzi FInstPet
Mr Duaij has a MPA Harvard in Public Administration and BA in Business Administration. He served with Kuwait Oil Company for over 30 years and is presently on secondment to Kuwait Government – Council of Ministries as General Manager of the National Committee for Missing & POW's Affairs.

NEW CORPORATES

Quest Environmental, Langton Priory, Portsmouth Road, Guildford, GU2 5WA, UK
Tel: +44 (0)1483 303070 Fax: +44 (0)1483 303080
e: quest@questenv.demon.co.uk
Representative: Simon Curwen, Managing Director
Quest provides a full range of services relating to contaminated land and groundwater. It has particular expertise on petroleum facilities, with more than 1,000 sites investigated and 100 remediated since 1993. The company's services range from strategic advice on management of multiple sites, through to investigations, risk assessment and physical clean-up. Its aim is to provide business solutions to environmental problems.

Bulgarkontrola SA, 42 Parchevich Street, 1080 Sofia, Bulgaria PO Box 106
Tel: +359 2 874 092 Fax: +359 2 882 354
e: bulkont@techno-link.com
Representative: Bogomil Stoyanov, Exec.Director
Independent control organisation for carrying out cargo control, surveys, analyses and damage assessments. The certificates and documents issued by Bulgarkontrola are recognised by the International Court of Arbitration.

IP Conference and Exhibition

International Conference and Exhibition

INTERSPILL 2000

Brighton, United Kingdom
28–30 November 2000

INTERSPILL 2000

A major conference and exhibition featuring the activities of the European spill response industry, both at sea and on land. Under the direction of the British Oil Spill Control Association and organised by the Institute of Petroleum.

INTERSPILL 2000 will be the first in a cycle of regular events which will provide a forum for demonstrating European expertise in combating oil and chemical spills.

The theme for INTERSPILL 2000 will be 'A New Millennium – A New Approach to Spill Response?', which will provide an opportunity to reflect on the successes and lessons of the past whilst looking to the future.

Organised with the support of the European Union, Institute of Petroleum, International Maritime Organisation, International Oil Pollution Compensation Funds, International Petroleum Industry Environmental Conservation Association, International Tanker Owners Pollution Federation Limited, UK Department of the Environment, Transport and the Regions, UK Environmental Agencies, UK Maritime and Coastguard Agency, United Kingdom Offshore Operators Association, United Kingdom Petroleum Industry Association.

Background

There has long been a call for a major oil spill conference and exhibition to reflect the experience and the expertise of European companies and to complement other similar international activities. Based on an initiative by the British Oil Spill Control Association (BOSCA), it is planned that INTERSPILL 2000 will be the first in a regular series of such events.

The themes and structures for INTERSPILL 2000 are designed to ensure a productive occasion for attendees, presenters and exhibitors alike, providing a flying start to this European initiative. In order to achieve an integrated, focused and innovative programme, conference presentations on pre-determined subjects will be invited from selected individuals. Exhibitors, who will be aware of the subjects in question, will be invited to use poster presentations on their stands to relate their products and services to the themes of the conference.

Technical Programme

There will be five sessions entitled: salvage and cargo/bunker transfer; spillage response at sea and inshore waters; shoreline response, waste disposal and recycling; inland spills and remediation procedures; and innovation.

These sessions will cover oil and chemicals, environmental impacts, requirements and responses, liabilities and compensation, regulations and training. The first four sessions will present and discuss changes recently introduced or about to be introduced or otherwise not widely known, The fifth session is intended to introduce new possibilities for the future which may become operationally significant.

Organised in association with

INTERSPILL 2000 Brighton, UK 28-30 November 2000

NOSCA Norwegian Oil Spill Control Association

BOSCA British Oil Spill Control Association

SYCOPOL OSCA France

Who Should Attend?

INTERSPILL 2000 will be of interest to all who are concerned about the environment and involved in its protection, including:

- national and international environmental agencies
- oil, chemical, and transport industries
- port and harbour authorities, and offshore oil field operators
- central and local authorities, and emergency services

INTERSPILL 2000 will be of particular interest to those who wish to know the current and likely future positions regarding the prevention and control of spills, and the most effective and environmentally beneficial ways of cleaning them up. Above all, INTERSPILL 2000 represents an opportunity to pool knowledge and exchange ideas, to inform, learn and educate, and to develop business connections within a closely co-ordinated conference and exhibition.

Exhibition
Exhibitors can be confident that all who supply equipment, services and advice, including trade associations, will have the opportunity to integrate their exhibits, through their associated poster presentations, with the pre-selected themes and subject areas of the conference. They can also be confident of the opportunity to present their wares to a wide audience.

Date and Location

The event will be held from Tuesday 28–Thursday 30 November 2000 at the Brighton Centre in Brighton, UK. Extensive conference and exhibition facilities will be available to accommodate 500–700 delegates and to provide more than 2,000 square metres of exhibition space. Private suites will be available for corporate events and excellent marina facilities for displaying waterborne exhibits are close to the Brighton Centre.

Secretariat

For a copy of the First Announcement or to add your details to the mailing list to receive a copy of the programme and registration form (which will be available in April 2000), please contact:

Pauline Ashby, Conference Department, Institute of Petroleum, 61 New Cavendish Street, London, W1M 8AR, UK

Tel: +44 (0)20 7467 7100 Fax: +44 (0)20 7255 1472
e: pashby@petroleum.co.uk

EVENTS Forthcoming

DECEMBER 1999

7–8 December
London: *Developments in Measurement and Loss Control in Oil Refineries*
Details: Pauline Ashby, The Institute of Petroleum

5–6 **Nevada, US**
Hydraulic Failure Analysis: Fluids, Components and System Effects
Details: Josephine Felizzi, ASTM,US
Tel: +1 610 832 9500
Fax: +1 610 832 9635
e: jfelizzi@astm.org

6–7 **Aberdeen**
Meeting Environmental Standards for the Offshore Industry
Details: IBc Global Conferences Ltd, UK
Tel: +44 (0)20 7453 5491
Fax: +44 (0)20 7636 6858
e: cust.serv@ibc.co.uk

6–8 **California**
Tribolgy of Information Storage Devices
Details: Josephine Jones, Aston Universty, UK
Tel: +44 (0)121 359 3621
Fax: +44 (0)121 359 0156
e: j.l.jones@aston.ac.uk

7 **London**
Trinidad & Tobago: Opportunities for UK Companies in the Oil, Gas & Associated Industries
Details: British Trade International, UK
Tel: +44 (0)20 7215 4763

7–8 **London**
AUV Technology: Commercial Viability and Technological Achievements
Details: IBC UK Conferences Ltd, UK
Tel: +44 (0)20 7453 5491
Fax: +44 (0)20 7636 6858
e: cust.serv@ibcuk.co.uk

7–8 **London**
Subsea Developments in the Low-Cost Era
Details: Subsea '99 Conference
Tel: +44 (0)1367 242525
Fax: +44 (0)1367 241125
e: sen@btinternet.com

8–10 **Orlando, Florida**
Bandwidth Wholesaling & Submarine Networks
Details: IBC USA Conferences Inc, US
Tel: +1 508 481 6400
Fax: +1 508 481 7911
e: reg@ibcusa.com

9 **London**
Financial Planning Conference
Details: Emma Hyman, Institute of Fiscal Studies
Tel: +44 (0)20 7 291 4850
Fax: +44 (0)20 7 323 4780

9–10 **London**
2nd Annual Seabed Geotechnics: Maximising the Value of Geotechnical Data for Offshore Projects
Details: IBC UK Confeerences Ltd, UK
Tel: +44 (0)20 7453 5491
Fax: +44 (0)20 7 636 6858
e: cust.serv@ibcuk.co.uk

JANUARY 2000

25–27 **London**
Petroleum Process Plant Maintenance
Details: Sarah Watson, Energy Logistics International Ltd, UK
Tel: +44 (0)1628 671717
Fax: +44 (0)1628 671720
e: sarah@energylogistics.co.uk

26–28 **Houston, Texas**
Oil & Gas Offshore West Africa
Details: Strategic Research Institute, US
Tel: +1 800 599 4950
Fax: +1 212 967 8021
e: info@srinstitute.com

FEBRUARY 2000

9–10 **London**
3rd Annual E&P Data Management in Oil & Gas
Details: SMi Customer Services, UK
Tel: +44 (0)20 7252 2222
Fax: +44 (0)20 7252 2272

11–14 **Surrey, UK**
Understanding Oil Supply Logistics
Tel: +44 (0)20 7831 5588
Fax: +44 (0)20 7831 4567/5313
e: jackets@petroleum-economist.com

IP Week: 14 February
London: *Oil and Gas: An Industry Fit for the Millennium*
Details: Pauline Ashby, The Institute of Petroleum

IP Week: 15 February
London: *Restructuring of the Energy Industry*
Details: Pauline Ashby, The Institute of Petroleum

IP Week: 16 February
London: *13th Oil Price Seminar and Exhibition on Coping with Volatility – Futures and Derivatives for the Oil Markets*
Details: Pauline Ashby, The Institute of Petroleum

IP Week: 17 February
London: *The Middle East – The Key to Global Oil Supply*
Details: Pauline Ashby, The Institute of Petroleum

16–19 **Pattaya, Thailand**
Oil & Gas Thailand 2000
Details: Heather Edkins, Overseas Exhibition Services Ltd, UK
Tel: +44 (0)20 7862 2073
Fax: +44 (0)20 7862 2078
e: hedkins@montnet.com

23–24 **London**
Health Effects of Vehicle Emissions
Details: Energy Logistics International Ltd, UK
Tel: +44 (0)1628 671717
Fax: +44 (0)1628 671720
e: enquiries@energylogistics.co.uk

28–29 **Vienna**
1st European Catalyst Technology Conference
Details: EPC, Technology Conference
Tel: +44 (0)1483 771061
Fax: +44 (0)1483 756932
e: Europetro@cs.com

MOVES People

Earl R Sullivan is set to retire as Director of ASTM in February 2000 after 32 years in the post. His successor has been named as **David Bradley,** currently Manager of the ASTM Proficiency Test Programs, with experience in being ASTM Staff Manager.

Kevin McCann has been chosen as Chairman-Designate for Australian company Boral's new energy spin-off.

Following **Phillipe Jaffré's** resignation as Chairman of Elf Aquitaine, the Board has elected **Pierre Vaillaud** to the position. Vaillaud, an engineer in the Corps des Mines, was Chairman and President of Technip from 1992 to 1999. He was also Director at Atochem, the joint chemicals subsidiary of Elf Aquitaine and TOTAL.

Conoco Inc has promoted **Gary Merriman** to President for Exploration and Production for the Americas, effective 1 November 1999. Merriman replaces **John Kemp III**, who is to retire after a 34-year career with the company. In his new position, Merriman will be responsible for the company's existing E&P operations in Canada, the US and Venezuela.

Ian Ward has joined Preng & Associates, the executive search consultants, as a non-Executive Director with effect from 1 October 1999. Ward was Director-General of the Institute of Petroleum from 1991 to 1999.

Alf Cluer, BSc, FRCS, FIChemE, FInstPet, Consulting Petroleum Technologist, announced his retirement at the age of 87. He would like to thank all those who have supported his consultancy services in the past 30 years.

Pogo Producing Company has announced the appointment of **Stephen A Wells** to the Board of Directors of the Houston-based oil and gas exploration and production company. Wells is the President and Chief Executive Officer of Avista Resources, Inc based in Dallas, Texas.

Valve actuation company Rotork has made a number of new management appointments. *Ron Court* (left) becomes Marketing Director concentrating on support services to the sales organisation and the integration of recently acquired Fluid System Company. Court joined the company in 1969. He became UK Sales Manager in 1976 and then Sales and Marketing Director in 1988. *Carlos Elvira* (middle left) moves from International Sales Manager to become Rotork Sales Director. Elvira joined the company in 1981 as a graduate trainee. He was promoted to International Sales Manager in 1989. *John Pratt* (middle right) becomes International Sales Manager after eight years as Service and Site Projects Manager. From 1984 to 1991, he was International Sales Manager for the Middle East, Africa and Scandinavia. *Martin Hunt* takes over as Service and Site Projects Manager after nine years as Rotork Quality Manager. Hunt joined the company in 1987.

Richard L Rankin has been appointed Vice President of Foster Wheeler USA Corporation's Oil and Gas Division, responsible for upstream business. He will report to **Mike J Beaumont**, senior Vice President and General Manager for the company's Southwest Operations and will be based in Houston, Texas.

Briggs Marine Environmental Services has appointed Chartered Surveyor **Scott Grant** to the new role of Commercial Manager. Grant moves to the company from NG Bailey where he spent eight years as Commercial Manager for their Aberdeen operations.

Kvaerner Oil and Gas has appointed **Otto Søberg** as Managing Director, effective 1 November. Søberg will be in charge of field development and coordinating the company's offshore yards in Egersund and Rosenberg.

Pipeline Induction Heat Ltd has announced the promotion of **Phil Bond** to Managing Director. Bond joined the company in 1988 as Contracts Manager and became Operations Director in 1994.

Chief Executive of BP Amoco Shipping, **Richard Paniguian**, has left this position to become non-Executive Chairman of BP Amoco Shipping and will continue as Chairman of the Oil Companies International Marine Forum. **Linda Adamany** will succeed him as Chief Executive of BP Amoco Shipping.

Michell Instruments Ltd has appointed **Paul Newton** as Customer Support Engineer.

Ann Robinson has been appointed Chair of the Gas Consumers Council until 30 December 2003. Robinson is currently Director–General of the British Retail Consortium. In taking on the GCC Chair, Robinson will become Chair designate of the joint Consumer Council that the UK Government intends to create to rationalise and converge the activites of the GCC and the regional Electricity Consumer Committees.

J Peter Connors has been appointed President and CEO of Zurich's newly aligned energy businesses effective 1 November and is based in New York. Connors has over 20 years experience in the energy insurance business, primarily with American International Group. He currently serves as Chairman of the Offshore and Energy Risks Committee of the American Institute of Marine Underwriters.

Credit Lyonnais has appointed **Roy Leighton** as Chairman of its European Advisory Board. Leighton was previously Chairman of the derivatives operations of Credit Lyonnais Rouse and its affiliates where he will remain as Chairman in a non-Executive capacity.

Following the recent merger between Pakhoed and Van Ommeren, the resulting company Kononklijke Vopak NV (Royal Vopak) has announced the members of its Executive Board. **AH Spoor** is the Chairman, Chemical Distribution Europe and IT; **RR Hendriks** is Vice Chairman, Chemical Distribution North America and Finance; **HC van Westenbrugge** deals with Oil & Gas Logistics and Shipping Agency Services, and **NJA von Hombracht** with Chemical Logistics. Retired Chairman of the Executive Board of Koninklijke Van Ommeren NV, **CJ van den Driest** was recently made Knight of the Order of the Netherlands Lion. The award was presented to him by **PH Schoute**, Mayor of Wassenaar.

IP THE INSTITUTE OF PETROLEUM

IP Week 2000

London: 14–17 February

IP Week in February is the focal point in Europe each year when leading figures in the oil and gas industry travel to London for an intensive round of conferences, industry and trade association events, company meetings and social functions. The Institute's own programme of events forms the core of these activities

Monday 14 February

International Conference on **Oil and Gas: An Industry fit for the Millennium?**

The last two years have been momentous ones for the international oil and gas industry throughout the world. This major international conference will address the key issues in the industry today.

Who should attend?

- **Senior Management in the Oil and Service Industries**
- **Finance Directors, Bankers and Professional Advisers**
- **Policy Makers, Planners and Commentators**

Speakers include:

Mark Moody-Stuart *(Chairman, RoyalDutch/Shell Group of Companies)*

Thierry Desmarest *(President-Director General, TOTALFINA)*

Rodney Chase *(Deputy Group Chief Executive, BP Amoco plc) and*

Dr Rilwanu Lukman (right) *(Secretary General of OPEC and Presidential Adviser on Petroleum and Energy of Nigeria)*

Tuesday 15 February

Seminar

Towards the Total Energy Company

Organised in association with WOOD MACKENZIE global consultants

Seminar on

Bunker Trading and Price Risk Management

Organised in association with The International Bunker Industry Association

Speakers include:
Dr Richard C Ward (right)
Chief Executive, IPE London

Annual Luncheon

Guest of Honour and Speaker:
Lee Raymond
Chairman and CEO, Exxon Corporation

Wednesday 16 February

The 13th Oil Price Seminar and Exhibition on

Coping with Oil Price Volatility – Liquidity in the Pricing Instruments

Organised with the support of New York Mercantile Exchange

As we reach the end of the decade, 1999 has been, in many ways, the extreme case of how to manage price volatility both at low levels ($10.05/b in February) and high levels ($22.90/b in October). This 13th Oil Price Seminar will provide a cross-section of eminent speakers in the industry today and will discuss how different organisations in the international arena have been managing price risk in this extremely volatile period.

Annual Dinner

The Annual Dinner at the world famous Grosvenor House Hotel will be host to 1,500 of the world's senior oil executives.
Tickets are limited, so early booking is essential.

Thursday 17 February

International Conference on

The Middle East – The Key to Global Oil Supply

Organised in association with the Centre for Global Energy Studies

Any informed opinion today on the future of oil supply or price must include consideration of the oil, economic and political outlook for the countries in this complex and frequently volatile region. This major international Conference will address the key issues.

Who should attend?

- **Senior Management in the Oil and Gas Service Industries**
- **Exploration and Development Staff and Professional Advisers**
- **Policy Makers, Financiers, Planners and Commentators**

Speakers include:

Sheikh Yamani *(Former Minister of Petroleum and Mineral Resources for Saudi Arabia 1962-1986)*

Dr Ghanimi Fard *(Member of the Board and Director, International Affairs, NIOC)*

Steve Ollerearnshaw (right) *(Managing Director of Petroleum Development LLC)*

The IP Week 2000 Programme of Events and registration form is available from the IP Conference Department. To receive your copy contact:
Pauline Ashby, Conference Department, Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR, UK
Tel: +44 (0)20 7467 7100 Fax: +44 (0)20 7255 1472 e: *pashby@petroleum.co.uk*
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