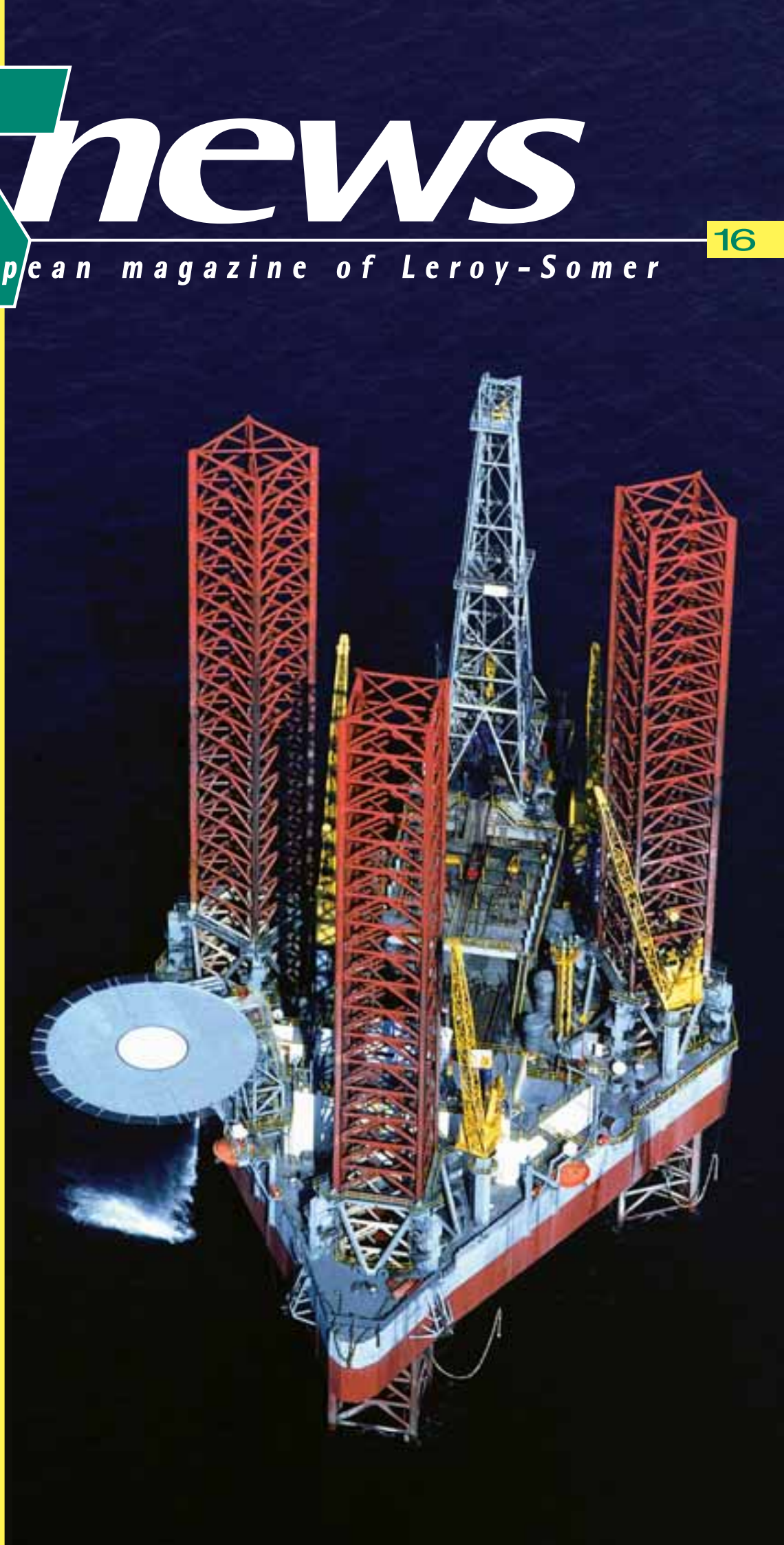
L news

The European magazine of Leroy-Somer

16

March 2006



The oil market - heading towards a new equilibrium

Few markets are as complex as the oil market: a simple flick through the fifty page monthly report published by the International Energy Agency (IEA) offers proof enough. There is a multiplicity of sources, types of crude, refined products, units of measurement (did you know that a barrel is equivalent to 42 gallons or 159 litres?), not to mention a wide variety of economic, political, climatic influencing factors. Harry Tchilinguirian, Senior Oil Market Analyst at the IEA, gives us a quick overview...

Can you give us an idea of the volumes consumed worldwide?

Some 83 million barrels are consumed each day, worldwide: 25 million by North America, 24 million by Asia, and 16 million by Europe. Since the end of 2003, global demand has increased considerably, due to simultaneous, strong growth in the United States and in China (the two largest consumers of oil products), with the rest of the world economy following in their wake.

Who determines the supply?

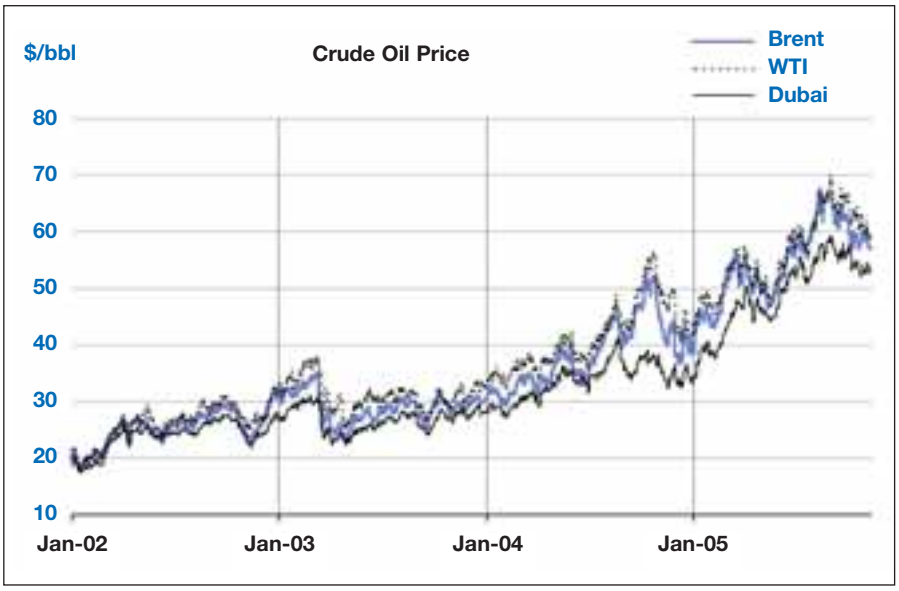
On the one hand, there are the member countries of OPEC, the Organisation of Petroleum Exporting Countries, with Saudi Arabia at the top, producing around 9.5 million barrels a day. Due to its reserves, and the fact that it has surplus production capacity, this cartel can increase or decrease the supply by defining production quotas for its member countries. The rest of the oil supplies are provided by the major non-OPEC oil-producing countries, such as Russia, the United States, some West African countries, the North Sea and Central Asia. These producers generally operate at maximum capacity.

What is the explanation for the current price rises?

Surplus crude oil production capacities are dwindling and at the same time, the soaring increase in demand has come up against the restriction of the refining capacities. And when the recent hurricanes caused the lengthy closure of the refining capacities of the world's largest consumer, the price of the finished products climbed globally, pushing up crude oil prices.

What conditions are necessary for prices to stabilise, or even fall?

Setting up new refining capacities to process the crude oils of the future, which will, in general, be "heavier". It is important to know that crude oil, converted into a "consumable" product in the refineries, is not a homogeneous commodity. Some crude oils are made of very long hydrocarbon chains; they are very viscous and do not flow easily: these are known as heavy oils. They are considerably more difficult to convert into "light" products, such as petrol or diesel, and require sophisticated refining capacities. Moreover, the additional supply that was recently offered by OPEC is predominantly made up of heavy crude oils, which could not be processed by the existing surplus refining capacity. Even though we anticipate the arrival of more light crude oils between the end of this year and the following year, additional capacity will be even more necessary since new large consumers, such as China and possibly India, are currently emerging.



Why wasn't there investment in the refining activity earlier?

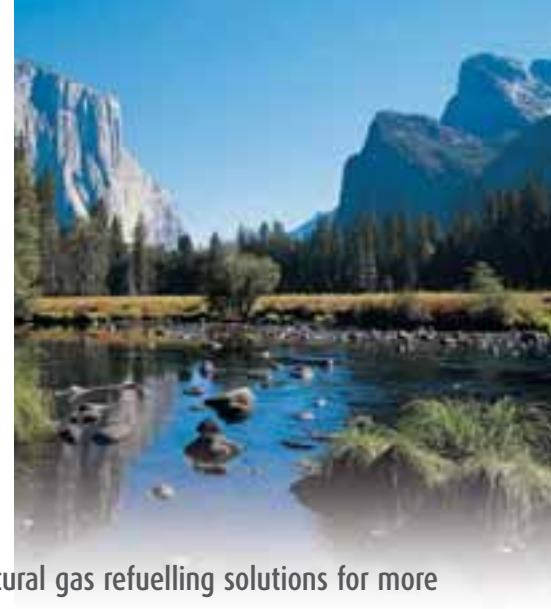
The profitability of the sector was very poor for the ten years preceding the major increase in demand. Even within the sector itself, production and exploration activities were more profitable than refining. This led to chronic under-investment. Furthermore, in the OECD member countries, legal provisions connected with the protection of the environment considerably restricted the building of new refineries. And of course, new refineries aren't built in a day. These are fairly long investment cycles (an average of five years), with a high degree of uncertainty as to the level of demand in the meantime. Thus, although 2004 and 2005 have experienced a major increase, this is still not enough from the oil company's point of view to justify a greater commitment, in view of the historical context of the sector.

The International Energy Agency

The IEA is an intergovernmental organisation set up to coordinate the energy policies of its 26 member countries. It is an autonomous body linked to the Organisation for Economic Cooperation and Development (OECD), and was founded during the oil crisis of 1973-74 to coordinate efforts to ensure the necessary supply of oil. In the last few decades it has broadened its sphere of activity to contribute to the safe supply of energy, economic growth and protection of the environment. The IEA employs around 150 people – mainly experts and statisticians from its 26 member countries – devoted to research, data compilation, providing advice on good practices, and producing a series of publications recognised for their objectivity.

Sources and useful links

- http://www.iea.org, the International Energy Agency website.
- The IEA monthly report on the oil market can be viewed at http://omrpublic.iea.org
- www.opec.org/home/, the Organisation of Petroleum Exporting Countries website
- http://news.bbc.co.uk/1/hi/business/904748.stm: This BBC article gives a clear overview of the different types of oil and the operation of this specific market.



FuelMaker, a leader in natural gas refuelling

The Canadian FuelMaker Corporation, based in Toronto, has been providing natural gas refuelling solutions for more than fifteen years. It manufactures, distributes, installs and services Vehicle Refuelling Appliances (VRA) for natural gas vehicles. The system developed by FuelMaker and used in its appliances has become established as the benchmark in the VRA sector.

Easy to fill up with natural gas

FuelMaker holds 94 international patents, including their state-of-the-art patented natural gas compressor. With over 9,000 VRAs sold worldwide, and the launch of "Phill", their Home Refuelling Appliance, FuelMaker have strengthened their position as a leader in the alternative fuels industry.
The FuelMaker VRAs combine a gas compression system with controls, electronic devices and software in a simple, compact device that can be safely installed almost anywhere, to refuel natural gas vehicles.

The various VRA models are built based on a series of modules developed by FuelMaker. Each model is a complete self-contained appliance that takes natural gas from a low pressure supply, compresses it to between 3000 and 5000 psi, and delivers it to a vehicle. By using advanced materials such as high temperature plastics and ceramics, the FuelMaker system does not require the use of oil to lubricate the cylinders. This provides for smooth, efficient operation at extreme temperatures, and thus maximum engine performance.

FuelMaker offers VRA models with a variety of pressures and flow rates. These VRAs are ideal for small to medium sized fleets of commercial vehicles, in-plant vehicles (such as forklifts and ice resurfacers) and fleets of small vehicles. The FuelMaker system is designed to refuel vehicles quickly (Fast-Fill) or over a period of time (Time-Fill) as required. The result is an efficient fuelling system that meets customer requirements in terms of convenience, practicality and low cost.

Phill: Refuelling at home

In 2005, FuelMaker launched their revolutionary Home Refuelling Appliance called "Phill". This small, compact time-fill appliance can be installed indoors or outdoors, and can be supplied from the existing residential gas supply. It offers consumers the ability to refuel their vehicles in the comfort and convenience of their own home. A good many of them may never set foot in a commercial filling station again!

A profitable partnership

Leroy-Somer has been supplying FuelMaker with made-to-specification rotors and stators for the motors on the FMQ range of VRAs since the early 1990s. Leroy-Somer worked closely with FuelMaker in making improvements to the products supplied.

One example of this is the reduction in the size of the rotors. Smaller parts have enabled FuelMaker to produce more compact units. Leroy-Somer has also helped develop parts that enable the VRA motor's thermal shutoff point (temperature threshold) to increase from 130°C to 150°C, thus optimising their operating range.

Throughout its experience supplying FuelMaker, Leroy-Somer has always been a "can make it happen" company. Whenever FuelMaker has needed product changes, Leroy-Somer has worked closely with the company in accomplishing the tasks, responding quickly in a spirit of continuous improvement. Leroy-Somer parts used in the FuelMaker motor have proved extremely reliable in the long term and have contributed to the success of FuelMaker's FMQ range of VRAs.

Advantages of the FuelMaker system:

- Its low capital cost allows fleets of varying sizes to enjoy the convenience and economic benefits of on-site natural gas refuelling
- Proven reliability, with thousands of satisfied customers worldwide
- Quiet, automated and simple to operate
- Built-in performance monitoring and diagnostics
- Ongoing 4,000-hour scheduled service intervals guaranteed throughout the life of the FuelMaker system
- Modular design for easy on-site servicing
- Oil-free compression delivers uncontaminated fuel to the vehicle
- Simple, inexpensive installation and site permit requirements
- Suitable for "time-fill" or "fast-fill" applications, or both
- Indoor and outdoor refuelling options

Dual certification for Novovent fans

An exclusive concept

Novovent is a Spanish company specialising in the manufacture of industrial and domestic fans. It has developed an exclusive system for adapting axial fans very precisely to customers' requirements, thus reducing energy losses. The MNS, or Multiflow Novovent System, is based on an impeller assembly concept that provides a choice of five blade position angles for a given diameter and speed of rotation.

An example of collaboration

In Spain, garages have to comply with two sets of regulations - the "NBE-CPI/96" Building Standards, Royal Decree no. 2177/1996, and the Additional Technical Instruction ITC-BT-29, Royal Decree no. 842/2002 (Low Voltage Electrical Engineering Regulations).

The Building Standards require garages to have special equipment to ensure the safety of persons against fire risks. The Low Voltage Electrical Engineering Regulations of 2002 go further: they describe garages as an example of a dangerous location in which there is a class 1 explosion risk, as there can be gases, vapours or mists in sufficient quantities to produce explosive or flammable atmospheres.

NOVOVENT, looking for a single solution compliant with both the Building Standards and the Low Voltage Regulations, asked Leroy-Somer, its usual supplier of 400° 2h high temperature motors, to provide it with motors with this dual certification. Leroy-Somer's fast, positive response enabled NOVOVENT to be the first Spanish manufacturer to offer motorised axial fans (the most suitable appliances for installation in hazardous areas) certified for both sets of regulations.

In 1996, the publication of the Building Standards led to the creation of the NOVOVENT PIROS range, for installations requiring fireproofing. The Low Voltage Electrical Engineering Regulations of 2002 led to the development of the new NOVOVENT PIROS (Exx) range, providing protection suitable for zone I potentially explosive areas. NOVOVENT also makes fans for installation in non-hazardous areas, giving the company one of the most extensive and comprehensive ranges on the market.

Range supplied by LS: FLSHT range, EXII3G option

IMAG launch Leroy-Somer Shaft Mount Units in UK

Gear unit repair specialists Industrial Motors and Gears Limited, based in the North East, are proud to have become the sole UK distributor stocking Poulibloc Shaft Mount Speed Reducers (PB)

These units are suitable for a variety of applications including conveyors, crushers, mixers and extruders. The tried and tested design has been proven in a variety of arduous environments and includes ATEX approved versions for hazardous areas.

The unique output sleeve design allows quick and easy fitting without the use of heat.
The sleeve also permits the complete unit to be rapidly removed from a machine shaft.
Without this system, users of other types of shaft mounted gear units in corrosive or external applications are often forced to destroy the machine shaft to remove a gear unit. This is a costly, both in time and money, addition to maintenance budgets and planning.

A wide range of bore sizes are available in both metric and imperial sizes.

Faster delivery response is ensured by a comprehensive stockholding of complete units and backstops within the UK. In fact IMAG are maintaining the stock to ensure consistent availability of the industry standard ratios 5:1, 12:1 and 20:1.
Additional ratios 15:1 and 25:1 are available from the Leroy-Somer factory on a reduced delivery time.

The high efficiency of the PB shaft mount combined with the EFF1 electric motors can offer significant energy savings to the environmentally aware user.

The partnership has been so successful that IMAG have made further investment in the Leroy-Somer product range by stocking the Compabloc range of in-line geared motors (CB) and also the Digidrive SK and Varmeca ranges of frequency inverter.

“The Varmeca principle of complete motor control integral to the motor itself has created a lot of interest in the marketplace. We anticipate growing sales in this area” says Neil Waddington Director IMAG Innovation Centre.

Industrial Motors and Gears Ltd

The Innovation Centre
Kirkleatham Business Park
Redcar
TS10 5SH
Cleveland

Tel: 01642 777977
Fax: 01642 777988

DRIVES GET THE WIND UP

Formula One test facility returns for an upgrade after 19 years!

Imperial College's Honda Wind Tunnel, recognised as a major facility for Formula One testing, has been upgraded to give a boosted wind speed of up to 48 m/second – the upgrade makes use of the modern electronic DC drives and square framed DC motors, a powerful combination from Control Techniques and Leroy-Somer!

"There was nothing wrong with the old variable speed drives," says Professor John Harvey, "but we needed extra power to reflect the increased performance of today's F1 cars, so we chose the latest Mentor II DC drives as a straight replacement."

The wind tunnel, which is optimised for race car testing, has a rolling road with a new contoured wall test section that allows testing of models up to 50% scale. With an automated support strut and integral six-component force balance and the ability to yaw the large rolling road to simulate the effects of crosswinds, the facility produces comprehensive data on all forces, pressure and flow velocity.

The powerful data processing software gives rapidly assimilated test data so that results can be easily understood, saving downtime between tests and making the facility very cost-effective for contractors and car manufacturers alike.

Limited space dictated an unusual design that features two, 2.38 metre diameter fans, running side by side, driven by twin 106 kW Leroy-Somer LSK1804VL06 1100rpm square laminated DC motors, controlled by Control Techniques M350 Mentor II drives, load sharing and running in speed control. The LSK design allows for larger than normal powers for the frame size due to the square lamination making up the body of the motor.

"Our original drives, installed in 1985, were from KTK (one of Control Techniques' founding companies)," says Professor Harvey. "They worked perfectly for 19 years, so we were more than happy to consider the same supplier again.

We also installed a Leroy-Somer LSMV180M 18.5 kW AC motor and Unidrive from Control Techniques to provide suction under the rolling road to remove the 'boundary layer' of retarded air approaching the rolling road that can affect results."

The new drives can produce a maximum wind speed of up to 48 metres/second, although 40 metres/second is the optimum test level at present, being equivalent to 100 mph (200 mph scaled up).

The upgrade of fans and all associated equipment took just four weeks, with the entire electrical fitting being carried out by Leicestershire-based Dynamotive, who also built the drives panels. "It all went very smoothly" says Imperial College's Nigel McCarthy, who was responsible for the software upgrade. "We were back on line in record time ready for front line testing of F1 and Indy Cars."

In addition, modifications were carried out on the main model and wheel drag balances and Dynamotive also carried out modifications to the rolling road itself to give up-rated performance.

The wind tunnel was originally designed by Imperial College's Professors Bearman and Harvey and was constructed as the result of a jointly funded programme with Honda Research and development, to investigate aspects of road vehicle aerodynamics and was opened in 1985 by the managing director of the Honda Motor Company.

The tunnel is of the closed return type with a closed test section, 3m x 1.5m in cross-section, with a long working length of 9m.

The 2.62m x 1.83m rolling road has a water-cooled platen and variable profile belt suction system to prevent belt lift underneath high down-force race cars.

The extensive boundary layer removal has two suction sections – one directly in front of the road and another some distance up-stream. By removing the boundary layer, the velocity deficit, measured vertically at the model position down to the belt surface, is less than 0.1%, an important factor when testing race-cars with very low ride heights.

PRECISE CONTROL

The speed of the boundary layer fan is precisely controlled by the Unidrive AC drive proportionally to the main fan speed, the LSMV motor design characteristics enable precise control over a very wide speed range including zero speed when an application demands it.

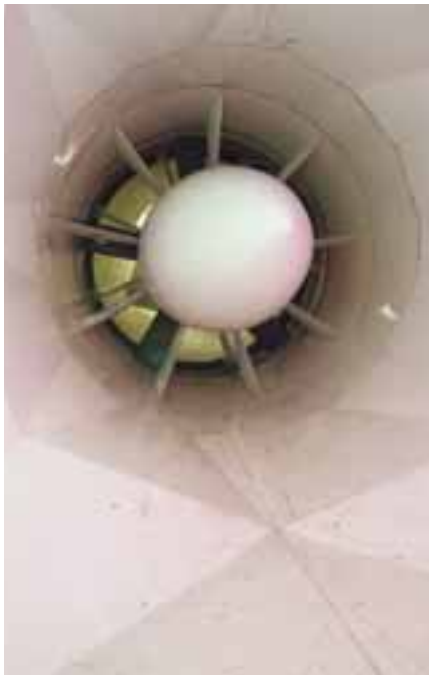
The two wind tunnel axial fans with pre-rotational and straightening vanes are positioned side by side in twin ducts. Speed control is crucial, with the Mentor II DC drives with outstanding current loop performance giving speed holding of better than 0.1%, with speed control via a standard communications interface with the host computer.

Turbulence of less than 0.2% is achieved using a honeycomb, followed by a mesh screen mounted in the contraction section. The aerodynamic forces are measured using a six-component balance situated within the model and a maximum of 48 channels of pressure data is also available.

In many instances, model racecar wheels are mounted off the body with supports from the side of the tunnel, allowing wheel drag to be measured independently. The Mentor II Digital DC drive range spans 24 to 1850 amps, from stand-alone installations to networks using most industry-standard communication protocols. Easy to set-up and commission using 'Mentorsoft' software and with off-the-shelf software for many common requirements such as digital speed and position loop, centre-winder, shaft orientation, s-ramp and others, the Mentor II can be found in applications as diverse as steel and paper mills, textile and plastic manufacturers and cranes, conveyors and wire drawing.

With standard features that include single and four quadrant operation, field and phase loss protection, 0.1% speed holding for 100% load change, with tacho feedback, advanced auto-diagnostics and software expandable using MD29 application modules, Mentor II has been a market leader for some years.

The Honda Wind Tunnel at Imperial College has been subject to an ongoing programme of development and improvement whilst maintaining its position as one of the most accurate and reliable facilities of its kind in the world. Upgraded SCADA and the facilities to vary the model ride heights during a run was well as facilities for adjusting yaw and roll, have all contributed to faster and more repeatable test runs.



Control Techniques web site
www.controtechniques.com

Grout pumping: Leroy-Somer has the gear

At the Dounreay nuclear research facility station on the north-eastern tip of Scotland, work begins in the next few years to remove radioactive waste from a 4.6 metre diameter, 65 metre deep shaft. By that time the shaft has to be watertight.

Colcrete Eurodrill recently supplied equipment for use in the project. Scottish based Ritchies – the geotechnical engineering division of Edmund Nuttall, are carrying out the job. Hydraulic isolation will significantly reduce the amount of groundwater entering the shaft during future operations to remove the waste.
Solid intermediate-level radioactive waste was disposed of in the shaft up until 1977.

The shaft was originally constructed way back in the mid 50's as part of a tunnel system that runs 600 metres below the sea. The shaft contains 750 cubic metres of radioactive waste including various bits of gradually decaying discarded equipment from nuclear labs. The aim of the immediate project is to seal fissures in the hard rock around the shaft by grouting. Sealing the rock around the shaft will pave the way for the eventual removal of the waste.

The containerised package designed and manufactured by Colcrete Eurodrill will facilitate the cementitious and chemical grout injection. It consists of an automated mixing system fed from big bag discharge stations.

The mixing station has the ability to handle all the mix recipes required for the project. From here the mixed product passes to one of five storage tanks, which feed high-pressure injection pumps powered by VARMECA integrated electronic variable speed drives.
Several different recipes can be injected at any given time.
Simultaneously, additives can be added to gel the mix as it enters the ground. For the final sealing needs of the project, a two-part resin injection system is supplied.
All the Colcrete Eurodrill equipment is controlled and monitored from a central control cabin, facilitating GIN curve grouting methods.

Colcrete Eurodrill General Manager, Mark Rex said that, *"The project was challenging, as the overall package had to be designed virtually from scratch to meet the contractors demanding requirements. The quality of the product from our mixers is well known to be perfect for the nuclear industry, so it was a question of carefully matching the performance of the two mixers, the agitation storage tanks and the five grout pumps to orchestrate the correct mix of ingredients to the right place at the right time."*

The hydraulic isolation process requires that a grout curtain, designed in an oval shape, encloses the shaft and its junction with the undersea tunnel. The initial inner ring of boreholes around the shaft will be sealed with a fast gelling cement grout mixed in the Colcrete Eurodrill plant. Then, another grout curtain will be built up around the outside of the inner ring, this time utilizing specialist ultra-micro fine grouts. When properly mixed, the resultant product can be pumped long distances and will penetrate even very narrow fissures for up to 5 metres in to the rock.

Iain Robertson is the onsite project manager for Ritchies and he said, *"Because of their experience, Colcrete Eurodrill understood what we were looking for and responded quickly. The equipment is very effective and we continue to get great support as the project requirements develop."*

COLCRETE EURODRILL

Tower Business Park

Derby Road
Clay Cross
Derbyshire S45 9AG
United Kingdom
Tel: +44 (0)1246 868700
Fax: +44 (0)1246 868701
Email:
info@colcrete-eurodrill.co.uk
www.colcrete-eurodrill.com

Tuscany, Siena and the Palio

Siena is one of the most enchanting, attractive cities in Tuscany.
Located at the heart of this beautiful region, nestling among the arid hills, visitors use such adjectives as “magnificent”, “unique” and “fantastic” to describe this city. Lying beside a major road linking Rome and France, Siena emerged as a city at the beginning of XII century, truly flourishing around 1300 after continued development – the Piazza del Campo dates from this time. The plague that ravaged the city in 1348 cut its population from 50,000 to 10,000 and put an end to the building of the “Duomo”.
Over the centuries, Sienna and Florence fought over the supremacy of Tuscany. This dispute ended, under the Medicis, with the victory of Florence. While Florence is a shining example of a Renaissance city, Sienna prides itself on its Gothic mediaeval facades.

The Piazza del Campo is a perfect symbol for this magical city. Located in the heart of Siena, and surrounded by a dozen Gothic palaces, the Torre del Mangia and the Palazzo Pubblico, this fabled square hosts one of the most thrilling spectacles of our times - the Palio delle Contrade - whose history is inextricably linked with that of Siena. Since the XIII century, the districts of Siena, called Contradas, have held a costumed fair, including a horse race through the city, whose roads were decorated for the occasion. This horse race has developed over the centuries into today’s Palio delle Contrade, in which jockeys from all 17 districts, riding bareback, compete in a race held on the Piazza del Campo. They have to complete three consecutive circuits of the square, and the winner is the one who carries off the Palio, a precious silk banner attached to a halberd.

Since 1928, the Palio delle Contrade has been held twice a year, on 2 July and 16 August. It is one of the main events of the year for the city’s inhabitants. The Palio proper takes place at 7 o’clock in the evening, after three days’ training and the famous historical procession of the various Contradas in their brightly-coloured costumes, in front of the Duomo, through the narrow alleyways of the old city and behind the Piazza del Campo. Ten horses compete in each race, which last a mere 90 seconds. At the start, the jockeys line

up their mounts between two ropes and wait for the off. Then they tear round the tight bends, getting in one another’s way, hitting each other with sticks and jostling their rivals with their horses. Long after their victory, the winning Contrada parades through the whole city, singing and celebrating.

Leroy-Somer gushes ideas... and oil

The Oil & Gas industry, ranging from the extraction of oil, and its transportation through to its conversion, represents an extremely diversified market for a manufacturer of drive systems like Leroy-Somer. It is a market that requires extraordinary flexibility and innovation. Here are five cases in point...

The Sincor project. General view of the extra-heavy oil in San Diego de Cabrutica, situated in the Zuata region of the Orinoco Belt, 500 kms south-west of Caracas.

Onshore extraction of heavy oils

The Sincor consortium, whose main shareholder is Total, is working on an extremely ambitious project - the exploitation of a huge deposit of extra-heavy oil in Venezuela, and its conversion into light synthetic crude, for which there is high demand on the international market. This project has required extraordinary powers of innovation from everyone involved, in particular for the extraction of some 200,000 barrels of extra-heavy oil per day from the sand. The deposit is exploited using very long horizontal wells that pass through the geological strata at depths of between 350 and 600 metres. Subsurface pumps inject a diluent that reduces the viscosity of the crude oil . The production itself is carried out using progressing cavity pumps (PCP) located on the surface. Extraction started in 2002.

[1]Source : Total http://www.total.com/portail/webzine/

Relatively lightweight motors were needed to drive these pumps, with variable speed drives to adapt the speed, and thus the flow rate from the reservoir, while complying with the environmental requirements in terms of mains harmonics.

The local engineering consultancy (GTME) who carried out the initial consultation work examined the various available technologies before choosing the Leroy-Somer's regenerative drive. This provides effective mains protection against feedback caused by the variable speed. We still had to successfully tender for the contract with the Sincor consortium, which was looking for a project manager that could offer a complete drive assembly comprising the electrical control console and the drive. To do this, Leroy-Somer formed a partnership with the Schneider group, which specialises in the global development of electrical networks and automation. Leroy-Somer supplied fifty one LS 280 M 6 pole 115 kW motors and fifty one 100 kVA Powerdrive regenerative drives. The motor + drive assembly are ATEX certified. To satisfy the weight restriction – the motors are perched on the fairly light structure of the wellheads – Leroy-Somer proposed motors with Alpax housings, which weigh less than a third of those of cast iron motors.

While the Sincor project required considerable innovation, Leroy-Somer motors are also used on sites where heavy oil is extracted more conventionally using beam pumps - the famous "nodding donkeys". In 2005, six hundred IP 55 Nema "D" high slip motors, with power ratings ranging from 22 to 55 kW, were supplied to the Venezuelan national company PDVSA, to replace the motors on a series of beam pumps that had come to the end of their useful lives. Some eleven thousand pumps of this type are currently in use in Venezuela.

© Zylberman Laurent

Arrival of the production platform FPSO (Floating Production and Storage and Off-loading) in the Girassol deep sea oilfield, off the coast of Angola.

Deep offshore extraction

The largest deep-sea oilfield discovered to date is in the waters off the coast of Angola, at a depth of around 1350 metres. Its name is Girassol. It is operated by Total using a floating oil production unit, itself the largest in the world (300 m long and 60 m wide). Other deposits have been discovered near Girassol, including Rosalirio, which was discovered in 1998. Located 135 km from the Angolan coast, at a depth of 1300 to 1500 metres, its operation requires the installation of a new floating platform, connected to the Girassol platform for processing. Leroy-Somer is supplying all the low voltage motors for this new platform, including six large type "D" motors of more than 100 kW, with six VSD Power Drives. Production is due to start in the first half of 2007.

Another oilfield also being developed is Akpo, in Nigeria. Discovered in 2000, it is to be operated by Total starting at the end of 2008, once the wells and the production, storage and offloading platform are completed. Leroy-Somer has supplied the main alternators for this platform (four 1825 kVA – 6600 V – IP 55 alternators).

Petrochemicals

Ethylene is one of the main derivatives of oil. It is obtained by steam cracking - the breaking down of the hydrocarbon chains of the oil using steam. It is used in the manufacture of polyvinyl chloride (PVC), widely used in the building industry, and also in the manufacture of plastic bottles, clothing, etc.

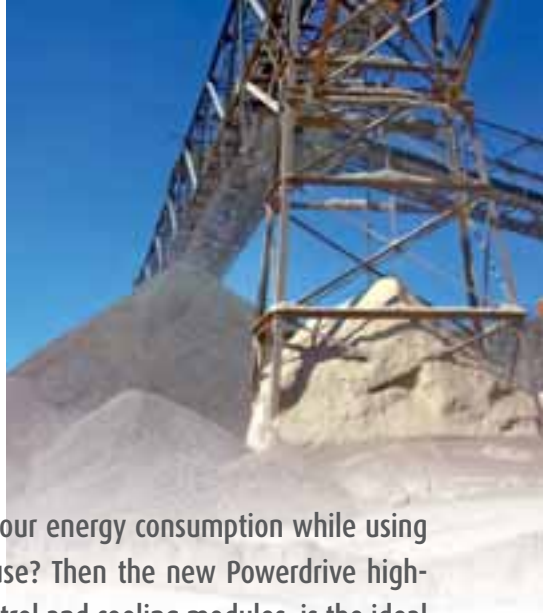
In 2002, the two main manufacturers of ethylene, Q-Chem and Qatofin, began building a new production unit in Qatar, at Ras Laffan. From 2007 on, the new unit – one of the largest in the world – will be able to produce around 1.3 million tonnes of ethylene a year. All its low voltage motors, types "N" and "D" ranging from 1 to 132 kW, are to be supplied by Leroy-Somer. The company has won the exclusive supply of these motors, via a framework contract with Technip, Europe's leading and the world's third-largest engineering company.

Remarkable success

While the Sincor and PDVSA projects have been concluded as a result of direct approaches to the operators, with the supply of innovative products for specific applications, Rosalirio, Akpo and Ras Laffan have required the setting up of long, complex specification processes with engineering consultancies. Only companies like Leroy-Somer, with its

© H. Schelbel/zefa/Corbis

huge global network, exceptional expertise and a comprehensive range of products and services, could aspire to achieving such success!



Powerdrive, power à la carte !

Do you want to improve your process and productivity, have better control of your energy consumption while using products that are recognised for their reliability, sturdiness and simplicity of use? Then the new Powerdrive high-powered variable speed drive, based on the combination of separate power, control and cooling modules, is the ideal solution for your application!

Modular construction

The power bridge is created by combining rectifier and inverter bridge modules, together with cooling modules and electronic control cards. These modules are assembled on chassis or in cabinets, with a support structure that is unique to Leroy-Somer. The combination of modules and choice of cooling method (standard air cooling, or, on request, liquid cooling) means that numerous configurations can be created, and optimised to suit each application offering a 6-pulse, 6-pulse multi-output, 12-pulse or regenerative solution.

Compact design

Compactness is one of the main features of the Powerdrive - the dimensions of a complete 355 kW drive, containing the power modules and the RFI filter, together with a braking module and an emergency stop safety device, are only 600 x 600 x 2160 mm. If the power needs to be increased, all you have to do is connect cabinets in parallel, so it is perfectly possible to assemble a multiple drive with a common DC bus.

The protection class when installed in cabinets is IP 21, and IP 54 is also available with the same dimensions.

Simplicity

The Powerdrive is easy to commission using the human machine interface on the front panel, which provides user-friendly access to the parameters, as well as displaying operating data. The default factory configuration, which is suitable for most applications, enables it to be started up with just eight parameters (four for the application and four for the motor).

Auto-tuning of the motor characteristics is performed at the first configurable run command. The parameters can be saved and copied very quickly using the “XpressKey”, a key patented by Leroy-Somer. The Powersoft software also offers a parameter-setting wizard and online help function.

Safety

A safety input, conforming to EN 954-1 category 3, and CETIM approved, enables the motor to be de-energised by the drive. The integrated safety relay triggers the locking of the power bridge hardware, thus cutting down the number of protection components required.

A preventive self-test is also carried each time the drive is powered up. The drive automatically sets itself to a reduced voltage and tests the main components. Thus any faults are detected before any irreversible damage can be done. The Powerdrive is also designed to be unaffected by external interference which may trigger uncontrolled switches to safety mode. These functions can be disabled for applications that require different behaviour.

Diagnostics following a switch to safety mode is assisted by the recording of various data.

Communication

Thanks to its integratable fieldbus modules, the drive can be adapted to suit all control/monitoring systems, such as Profibus, CANopen, DeviceNet, Modbus, Interbus or Ethernet.

Applications can be controlled remotely, using a communication interface module inside the Powerdrive. As well as the usual functions (parameter setting, data transfer, message transmission on events during operation, etc), warning or information messages can be generated for remote maintenance/monitoring of machines, by modem or integrated GSM module.

Energy saving

With the wide range of technical solutions available on the Powerdrive, numerous savings can be made, including restoration of energy to the mains supply (regenerative version), reduction of energy consumption by optimising the motor speed, sampling the active power only on the mains supply, reduction of the mechanical stresses on machines, and reduction of stoppages and maintenance time.

The parallel connection of several inverter modules on the same DC bus enables the energy consumed by the various motors to be regulated.

These savings generally amount to several times the initial capital cost!

Powerdrive application examples

Pumps

- Progressing cavity pump
Regenerative drive on IP 00 chassis (75 kW) with limitation of the harmonics fed back to the mains supply.

- Submerged centrifugal oil pump for crude oil extraction
6-pulse drive with output filter (55 to 550 kW), supplied in high-resistance, anticorrosion “outdoor” cabinet. Provision of a transformer at the drive output to supply the motor at 3000 V.

Sugar centrifuge

Regenerative drive (2000 kW) with output filter and electrical protection devices in air-cooled cabinet.
Input: two synchronous rectifier bridges in active redundant configuration.
Output: seven inverter modules supplying seven 275 kW motors. The inverters are powered by the DC bus. Hybrid Permanent Magnet (HPM) motor supplied.

Container crane

510 kW regenerative drive in cabinet. Input: one synchronous rectifier bridge with output filter. Output: four inverters supplying four 90 kW motors for driving the driving wheels and one inverter supplying two 75 kW motors for lifting.
The inverters are powered by the DC bus. The inverter and rectifier modules are liquid-cooled. Hybrid Permanent Magnet (HPM) motor supplied. Power supply via variable speed HPM generator driven by diesel engine.

Air compressors

6-pulse drive (45 to 300 kW) on IP 00 chassis integrated in the compressor, air-cooled. Hybrid Permanent Magnet (HPM) motor supplied. MODBUS RTU control via Human Machine Interface dedicated to the application.

Editor in chief :
Jean-Michel Lerouge
Leroy-Somer
Bld Marcellin Leroy
F-16015 Angoulême

Co-ordination and layout : Im’act

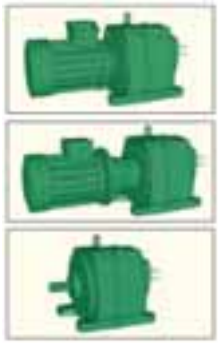
Editorial committee :
E. Dadda, A. Galloway, R. Lamprecht, J.-M. Lerouge, J.-P. Michel, Ch. Notté, C. Pegorier, O. Powis, G. T. Sørensen, M. Vanbeek, V. Viccaro.

The finest blends make the best vintage

The new 3000 gearbox range

Modular construction - high performance - service

The modular construction and facilities offered by the new 3000 gearbox range open up a whole range of new prospects! Today almost all Leroy-Somer's ranges of variable speed drives, drives and gearboxes are designed from the outset to operate together. Whether you use the Compabloc, the Orthobloc or the Manubloc, the gearboxes in the 3000 range can be assembled with the same motors and the same drives for all applications and all types of environment.



What is more, as a result of Leroy-Somer's expertise and experience in the field of drive systems, the new 3000 gearbox range achieves remarkable performance levels: up to 30% more torque, reinforced seal, easier maintenance, and a choice of fixing and mounting options.

LEROY SOMER®

www.leroy-somer.com

LEROY-SOMER U.K. Ltd • 8 The Square • Stockley Park • Uxbridge, Middlesex • UB11 1FW
Tel : +44 (0)20 8610 6025 • Fax : +44 (0)20 8610 6886

3882en-03.2006/h(United-Kingdom)