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SPECIAL REPORT
LIBYA

Iraq reconstruction update See page 7

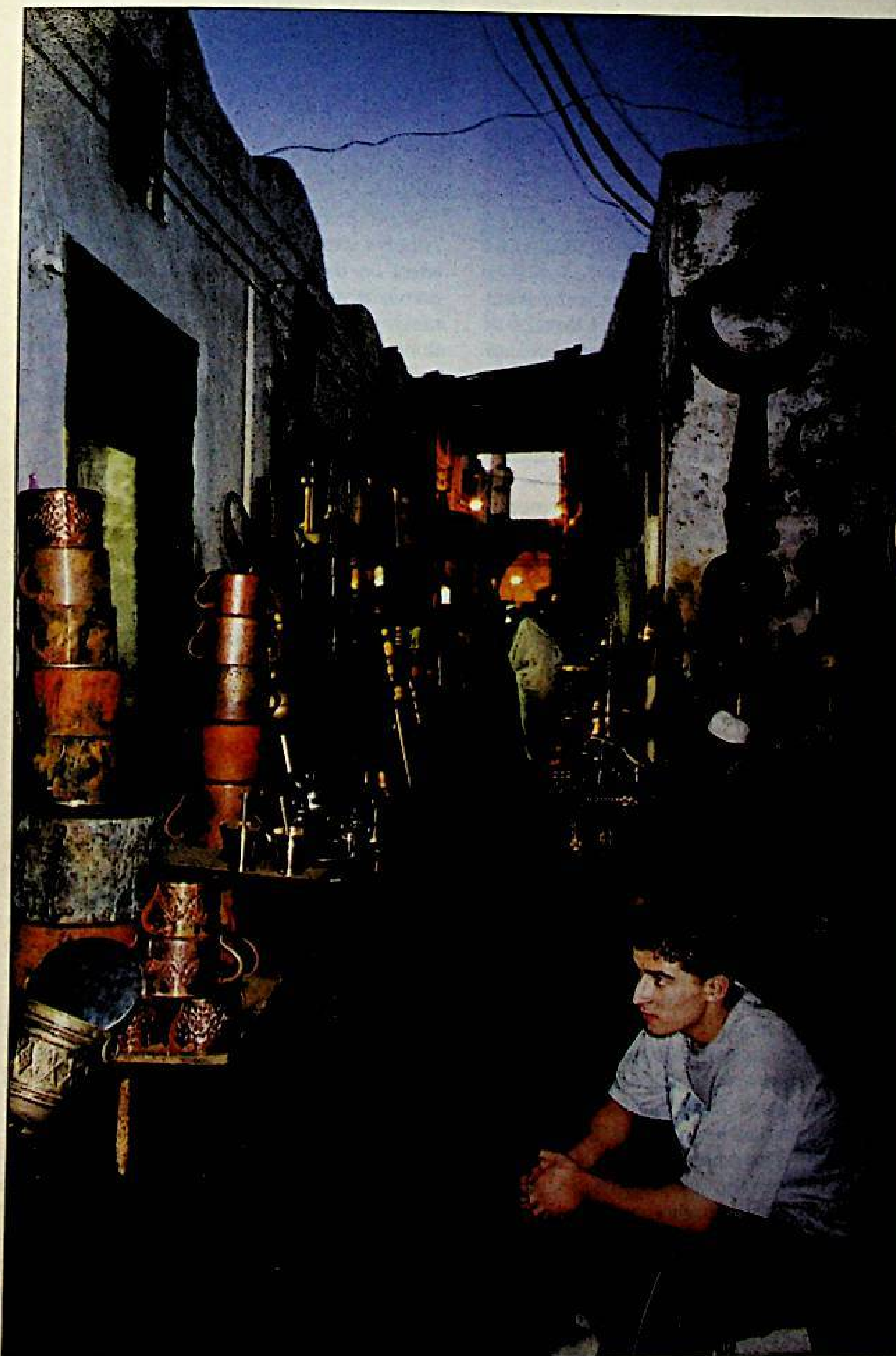
Cola Wars
Attack of the clones

Bahrain 4.600 dinars/**Egypt** 55.00 pounds/**Jordan** 9.00 dinars/**Kuwait** 3.600 dinars/**Oman** 4.50 riyals/**Qatar** 45.00 riyals/**Saudi Arabia** 47.00 riyals/**UAE** 46.00 dirhams/**UK** 8.00 pounds

An Emap Communications publication

New dawn

By accepting responsibility for the 1998 Lockerbie attack, and agreeing to pay compensation to the victims' families, Libya has taken the last crucial steps along the path to international rehabilitation. But while some see Tripoli's actions as nothing more than cynical plea bargaining, others are keen to welcome the oil-rich state back into the fold. ***Catherine Richards*** *reports on the re-emergence of the Jamahiriya*



After more than a decade of international isolation, Libya is preparing to come in from the cold. Tripoli's 16 August letter to the UN Security Council accepting responsibility for the downing of Pan Am flight 103 over Lockerbie in 1998, and its agreement to pay a total of $2,700 million in compensation to families of the victims, heralds the start of a new era for the Jamahiriya. The move, the culmination of years of diplomatic and legal wrangling, signals Libya's long-awaited observance of all conditions needed for the lifting of sanctions against the country. It is now, the optimists say, only a matter of months before normal trade relations are restored and Libya's rehabilitation into the international community is complete.

The timing for the country's leader Muammar Qaddafi could not be better. His political and economic overtures to the sub-Saharan African continent have produced little of lasting importance. His relations with Arab nations remain awkward. His commitment to the public sector has left his country's economy crying out for massive investment. Where else to look for injections of cash and technology but to the erstwhile enemies of the West?

For US oil companies, the repeal of Washington's unilateral sanctions is a priority

The permanent lifting of UN sanctions is now all but a fait accompli. Despite France's resentment over the size of the proposed Lockerbie settlement, which dwarfs the $34.4 million compensation Libya paid to relatives of those killed in the bombing of a French airliner in 1989, few believe Paris will carry through its threat to veto the lifting of sanctions.

Raising sanctions

But the removal of UN trade restrictions alone is unlikely to have any major impact on Libya. Millions of dollars have already flowed into the country since UN sanctions were suspended in 1999, when Tripoli handed over the two suspects accused of involvement in the Lockerbie attack. Instead, endorsement of the UK's tabled UN vote to revoke the sanctions is important mostly in terms of the pressure it will place on the US to follow suit. And with Libya now meeting all the requirements, it will become increasingly difficult for Washington not to play along.

For US oil companies, the repeal of Washington's unilateral sanctions is a priority. Since they were ordered out of Libya in 1986 by then US president Reagan, American firms have watched

Libya: financial indicators

	1997	1998	1999	2000	2001	2002e	2003f
Real GDP growth (%)	5.2	-3.6	0.7	4.4	0.6	-0.6	5.6
Inflation (%)	3.6	3.7	2.6	-2.9	-8.5	5.9	2.8
Central government revenues (% of GDP)							
Revenue, of which	35.6	34.8	48.1	42.1	44.1	46.7	50.2
Hydrocarbons	23.7	20.0	24.4	27.2	29.0	35.6	39.2
Expenditure, of which	36.0	38.9	35.7	32.6	44.4	42.9	38.4
Capital expenditure	7.6	6.2	8.3	10.3	10.5	13.7	13.5
Government surplus/deficit	-4.0	-4.1	12.4	9.5	-0.3	3.9	11.8
Balance of payments ($ '000 million)							
Exports (fob), of which	9.9	6.0	7.2	12.1	9.0	8.3	9.6
Hydrocarbons	9.1	5.6	6.7	11.6	8.5	8.1	9.4
Imports (fob)	7.2	5.6	4.7	4.1	5.3	7.4	6.3
Current account balance	1.9	-0.4	1.6	7.0	3.9	2.0	1.6
Official gross reserves	7.6	6.7	6.7	12.0	14.2	13.7	15.2
Exchange rate							
Official exchange rate (LD/$, end of period)	0.38	0.41	0.46	0.51	0.60	1.30	1.35
Libyan crude oil export unit value ($ a barrel)	19.0	12.9	17.9	28.0	24.1	22.8	27.2

e: estimate f: forecast Sources: IMF, Central Bank of Libya, MEED

with mounting frustration as their European rivals have scooped exploration and development concessions in a country widely considered to have one of the greatest untapped hydrocarbons potentials in the world. The introduction of the Iran-Libya Sanctions Act (ILSA) in 1996 did nothing to aid the US oil companies' plight, with the EU directing companies of member states not to comply with the legislation and threatening to take the US to the WTO if ILSA penalties were imposed.

Having lobbied for years for the lifting of US sanctions, the oil firms now sense that their efforts may finally be rewarded. Not only has Libya agreed to meet the four conditions set down by the US for the ending of sanctions – the renunciation of terrorism, acceptance of responsibility for Lockerbie, payment of compensation and sharing of information on the involvement of Libyan agents in terrorist activities – but the companies have in US President Bush one of its most pro-business leaders ever.

However, not all in the US share the oil companies' enthusiasm for repairing relations with Libya. Already, Tripoli's offer of compensation has been dismissed by some, especially those in the neo-conservative camp, as a cynical plea-bargain – buying off victims' families in order to open the door to Western investment. With Congress broadly opposed to restoring ties and members of Bush's own administration publicly calling for the removal of Qaddafi, analysts warn the lifting of US sanctions, and the removal of Libya from the list of states sponsoring terrorism, will be neither a fast nor an easy process.

"Libya's acceptance of responsibility and payment of compensation could and should herald the start of a new era in relations with Washington, but it is not going to be plain sailing" says George Joffe, deputy director of the London-based Royal Institute of International Affairs. "The White House plainly wants to be done with the Libya issue, but to do so it is going to have to work hard to persuade Congress to lift the sanctions and this is going to take some time."

Pessimists warn that Bush's allegiance to corporate America could actively prevent the swift repeal of sanctions. "The president has his eye on his own re-election in 2004," says

"Libya's acceptance of responsibility and payment of compensation could and should herald the start of a new era in relations with Washington"

George Joffe, deputy director, Royal Institute of International Affairs

one London analyst. "After the whole Enron debacle, he's likely to steer well clear of any issues that could be construed as him favouring big business over the US people."

Joffe disagrees: "The deal has been in the offing for far too long for the US to turn it down now. The American public have been prepared for the agreement for many months, it is not going to come as a surprise to them, and the US has clearly accepted and communicated that Libya has met all the necessary criteria."

The resumption of US commercial ties with Libya would provide a vital boost to the country's lagging economy. The years of sanctions have served to nurture the perception of Libya as an international pariah state, so that even those companies legally permitted to do business there have approached Tripoli with caution. Then there are the practical issues of the embargo. Prohibitions on the sale of US goods and services has taken its toll on all sectors of the Libyan economy, but few areas have suffered as much as the oil industry – the mainstay of the nation's wealth. The absence of US-produced equipment has seen production decline dramatically from US developed fields and ambitious plans to augment oil and gas output have not materialised. Compounding the stagnation is the very real possibility that Tripoli has prevaricated over the award of exploration and development licences until the US companies return.

But Libya can ill-afford to continue dangling the prospect of unexplored concessions much longer. Despite burgeoning government coffers, derived from higher-than-average oil prices over the past four years, Tripoli's strong fiscal situation has had little effect on the much-trumpeted goal of economic diversification. Nor has there been much evidence of export revenues trickling down to benefit the wider population. The unaccounted nature of the nation's wealth might also be fuelling resentment among the Libyan people.

African dreams

Qaddafi's fanciful Africa policy bears much of the blame for the unpromising state of affairs. "While the CEN-SAD initiative [the federal grouping of Saharan states] has meaning and is working, the wider African policy has been nothing but trouble," says Joffe. "South Africa has stolen a march on Libya regarding the policy's political initiative, and together with Nigeria, South Africa is also at the forefront of the economic initiative. Colonel Qaddafi has been left with nothing, and he's very angry."

The failed charm offensive has not only tarnished Qaddafi's kudos as the potential leader of a united Africa, it has also exacted a heavy toll on his domestic prestige. The influx of as many as 2 million African migrants has done nothing to reduce the 30 per cent unemployment rate. Locals also blame the southern immigrants for the growing housing and welfare shortages and spiralling levels of crime and drug use. Ordinary Libyans have already vented their frustration once before, in the riots of September 2000, and as levels of bitterness rise again, there remains the likelihood that violent demonstrations could once more take place in Tripoli.

Steps are being taken to appease the disgruntled population. In early summer, the government was moved to increase salaries in an effort to ward off mounting criticism. Shortly afterwards, the post of African unity minister was scrapped and the portfolio absorbed by the Foreign Affairs Ministry – a gesture widely considered to be a tacit signal by the leadership that Africa was no longer the flavour of the month. But still more radical, and once unthinkable, measures are being proposed to push the country along the path to economic reform.

Qaddafi: Private ambitions

In a speech before the General People's Congress (GPC) in June, Qaddafi was widely quoted lambasting the public sector, previously the centrepiece of his Green Book's economic policy. The public sector has failed because it "depends on unqualified employees who do not care about the interests of their country", he is reported to have said. As a result, he concluded, the sector must be abolished and reforms enacted to pave the way for "people's capitalism".

With the failure of the public sector, Qaddafi's unexpected warmth towards private enterprise extends as far as calling for the privatisation of the oil industry. While the country's oil belongs to the nation, "it is not necessary that Libyan owners of these [energy] companies run them by themselves," he told the undoubtedly surprised delegates at the GPC meeting in Sirte. "They can assign any foreign expert to run these companies in a way to guarantee the promotion of the oil industry."

But it seems unlikely that the champion of the Third Universal Theory – Qaddafi's brand of 1970s socialism – will seek the wholesale divestment of the country's crucial revenue provider. "What is proposed is not real private-sector reform and capital investment in the conventional sense," says Joffe. "It is more a matter of removing companies and monopolies from the state apparatus and transferring them to fall under popular control."

The responsibility for steering forward the reform process falls on the shoulders of Shukri Ghamen, who was named prime minister after holding the trade and economy portfolio for just over a year. As Libya's former OPEC representative, Ghanem has the diplomatic ties and credentials required for drawing the country into the wider global community. In pushing the liberalist agenda, he is playing a leading role in Libya's application to join the WTO.

The appointment of Ghanem does not itself guarantee any radical improvement in the economic situation, however. "Libya has been working to attract foreign investment for several years now," says Oliver Miles, former British ambassador to Tripoli and now chair of MEC International. "The appointment of Shukri Ghanem is a continuation of this process, and while it is a step in the right direction, encouraging overseas business requires more than the selection of key personalities." What is needed, Miles says, is a change in culture to unlock bureaucratic stagnation and the arbitrary decision-making processes that characterise and stigmatise the country's business environment.

While Ghanem's persuasive talk of public/private partnerships and increased efficiency is guaranteed to win him friends outside the Jamahiriya, sceptics warn that those inside with vested interests in maintaining the status quo are unlikely to make life easy for the premier.

"Libya has been working to attract foreign investment for several years now. The appointment of Shukri Ghanem is a continuation of this process."

Oliver Miles, former UK ambassador to Tripoli

But there are signs that foreign investment is beginning to flow into Libya. Towering over the Tripoli waterfront is the Corinthia Bab Africa hotel, a gleaming structure complete with pool and presidential suite that would not look out of place on a Gulf corniche. The fact that the Libyan Arab Foreign Investment Company owns a 47 per cent stake in the Malta-based Corinthia Group may have been a contributing factor in the latter's decision to spearhead investment in the nascent tourism sector, but the government is keen to see others follow Corinthia's lead.

Tourism has been identified as a priority area, not least because of its ability to draw in a whole new breed of overseas investor. A Tourism Ministry, headed by former prime minister Ammar Latif, was created in the June reshuffle as a sign of Tripoli's commitment to the sector. The plans are certainly ambitious – the final touches are being put to a five-year programme which envisages a total of $7,000 million of investment. Much of this will be devoted to the construction of new hotels and tourist villages close to the ancient Roman cities that act as the main lure for overseas sightseers.

As foreign businesses and tourists alike start to pay closer attention to Libya, the country is moving, albeit slowly, to open up on the political front as well. From its selection as the somewhat incongruous chair of the UN Commission on Human Rights, to Qaddafi's forthright and swift condemnation of the 11 September attacks, Libya is seeking to overhaul its international image. "There is a momentum for change in Libya," says Joffe. "The liberal groups that are pro-reform are in the ascendance, and the appointment of Ghanem is an indication that Qaddafi recognises this."

Perestroika or glasnost?

"We are seeing an easing in the freedom of information," adds Miles. "This is obviously essential for improving economic transparency, but it will have a hugely important impact on the political sphere. In recent months there has also been a move towards improving human rights legislation in the Libyan system – it would be electrifying stuff if it happens."

While glasnost of the scale and scope of Gorbachev's Soviet Union is unlikely to follow in the wake of the perestroika Qaddafi has unveiled for his country, analysts are hopeful that a lifting of sanctions could help push towards greater political and economic openness in the Jamahiriya. But can Tripoli afford to wait until then for the changes to take hold?

The withdrawal of restrictions on US firms doing business with Libya will remove an excuse that for 15 years has been trotted out to justify the country's poor economic performance. If change is not implemented soon, Libya faces the embarrassing prospect of the much-vaunted inflows of foreign direct investment failing to materialise, as has happened since the suspension of UN sanctions four years ago. While the forbidden fruits of Libya appear appealing when inaccessible, American companies are likely to pay close attention to the macroeconomic situation and wider business climate when they finally obtain permission to go in.

The lifting of sanctions will be celebrated in style in Libya, but it is the preparations under way in Tripoli right now that are determining the country's destiny. The beginning of a new era may be in sight, but the end is still far from clear.

■ Oil & Gas

Poised to break free

The hydrocarbons sector remains far and away the single biggest driver of Libya's economic fortunes, and the higher-than-average oil prices of recent years have served only to increase the significance of the country's oil and gas resources. Overseas oil shipments, mostly Europe-bound, earned about $10,800 million in 2002 and the figure is forecast to rise to $13,000 million for 2003.

Export revenue could have been even higher, but for years the country's output and production capacity has been constrained by the impact of US-imposed sanctions. The embargo has prevented the local oil industry, run by the National Oil Corporation (NOC), from bringing in much-needed equipment to enhance or simply maintain output at mature fields. It has also meant the US oil firms with assets in Libya – ConocoPhillips, Marathon Oil Company and Amerada Hess, together forming the Oasis Group, and Occidental Petroleum – have been unable to return to their concessions since 1986.

The American absence, combined with inexpensive recovery rates of high-quality crude oil, has made Libya an extremely attractive prospect for non-US oil companies. As a result, European firms in particular have been quick to seek a foothold in the hydrocarbons sector since the suspension of UN sanctions in 1999.

Their eagerness has been welcomed in Tripoli, where there is a growing recognition of the need to harness overseas investment and technology if capacity and output targets are to be met. NOC, which with its subsidiaries accounts for over half the country's oil output, intends to increase total capacity by just under 50 per cent to 2.6 million barrels a day (b/d) in the next few years. This will require an estimated $6,000 million in investment in exploration and production. But although NOC is strong on the rhetoric of bringing in foreign companies, the practical implementation of the policy has, initially at least, been less evident.

European firms have been quick to seek a foothold in the hydrocarbons sector

For almost three years, the 137 blocks that NOC offered in a May 2000 licensing round remained unassigned, leading some in the industry to conclude the move was intended to provide ammunition for US oil companies lobbying their government for a lifting of the sanctions.

However, as negotiations over Lockerbie neared conclusion, NOC announced in May 2003 that the first package of blocks had been awarded to a consortium of Spain's Repsol YPF and Austria's OMV. Under the terms of the deal the two firms, both of which are already active in Libya, will spend an estimated total of $90 million in exploring the six-block package, which includes acreage in the oil-rich Murzuq, Sirte and Kufra basins. Soon afterwards, Germany's RWE-Dea, a newcomer to Libya, signed an agreement with NOC to invest $57 million in a five-year exploration programme for a further six blocks.

Oil companies from further afield have also been maintaining a steady pressure on NOC in an effort to break into the lucrative Libyan market. After several years of sustained effort, India's ONCG Videsh in July finally received approval for a farm-in deal on two exploration blocks signed last August with Turkish Petroleum Overseas Company. Ukranian energy company Naftohaz Ukrayiny is also understood to be in discussions about participating in an exploration and development programme reported to cost about $300 million.

Surging supplies

In addition to increased activity on the exploration front, Libya is also preparing itself for an upsurge in output as a series of developments come on stream in the coming year. But foreign investors' enthusiasm for the new production has been tempered by past experience. Not only have many foreign producers in Libya already had to implement prorata output cuts to enable Libya to comply with its OPEC quota, they have also had to struggle against bureaucratic foot-dragging on new projects.

Italy's Eni has been one of the worst affected, with the proposed peak production of the 150,000-b/d Elephant field development pushed back to 2006. Initial start-up of 50,000 b/d from the scheme is set for late 2003. Others too have suffered setbacks in new developments. France's Total had initially planned to tender the expansion to its 18,000-b/d Mabruk field back in 2002, but only received approval to go ahead with the project earlier this year. Production from NC 137 is expected to start up later this year.

Petro-Canada is on the way to reaching peak production of 24,000 b/d at the El-Naga field, having produced its first oil in the first quarter of 2003. The Canadian company is also in discussions with NOC to boost production at the Amal field, where reserves are estimated at about 6,000 million barrels. Further down the road, two Repsol-operated blocks, NC 186 and NC 190, are expected to peak at a combined output of 90,000 b/d.

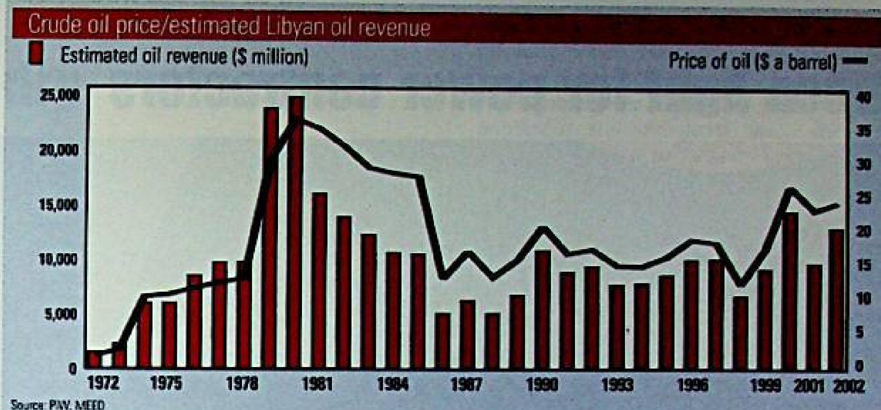
As Libya's oil output rises step by faltering step, Tripoli is paying increasing attention to its gas-producing capabilities. Keen to replicate the success of its neighbour Algeria, Libya is hungrily eyeing Europe as the main market for its gas resources. Proven reserves total 47 trillion cubic feet, but that figure could rise significantly, given that less than 70 per cent of the country has been explored. At the same time, Libya is seeking to convert domestic oil-fired power plants to gas-driven units, to free up more oil for export.

To date, the mainstay of the country's gas development plans is the $5,600 million Western Libya Gas Project. The 50:50 joint venture between NOC and Eni aims eventually to transport 8,000 million cubic metres a year (cm/y) to Europe. Italy's Edison Gas has signed up to take half the supplies once the massive project starts up at the end of 2004; Gaz de France and Energia Gas will take 2,000 million cm/y each.

Tripoli is paying increasing attention to its gas-producing capabilities

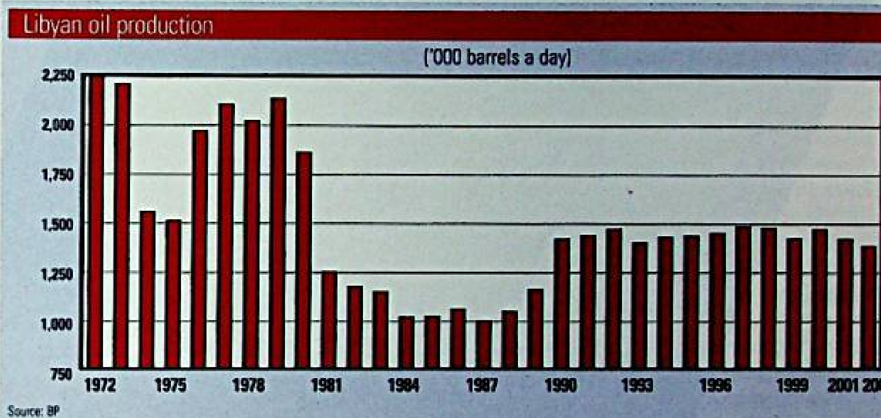
Work on the multi-phased project is progressing well. NOC/Eni has awarded all but one of the main components – which include the development of both offshore and onshore blocks, pumping stations, gas processing facilities and national and international pipelines – in preparation for first gas to flow through the 540-kilometre subsea pipeline to Italy. There's still a long way to go, but Libya is aiming high.

Crude oil price/estimated Libyan oil revenue



Source: PIW, MEED

Libyan oil production



Source: BP

Interview: National Oil Corporation chairman, Abdulhafid Zlitni

"We plan to award 20 additional blocks by the end of this year"
Abdulhafid Zlitni

MEED: ***What is Libya's present oil and gas production capacity? How is this set to change in the coming 10 years?***

Zlitni: Under the current capabilities we can produce up to 1.8 million barrels a day [b/d]. With the expected increase in the level of exploration activities, the coming on stream of the newly-discovered fields presently under development – Elephant, Al-Jurf, NC 186 A and D – and enhanced oil recovery projects such as that under way at Nafoora, we expect production to be around 2.6 million b/d.

How will this be achieved?

We have more participations planned with international investors in the three areas mentioned and we are confident that additional reserves will be added. In addition, NOC and its affiliates will undertake increased investment programmes.

What progress has been made towards awarding the remaining blocks of 137 that were tendered in May 2000?

We have awarded 12 blocks in two agreements [six to Repsol YPF of Spain and Austria's OMV in May, and six to Germany's RWE-Dea in June]. We plan to award 20 additional blocks before the end of this year.

Have any amendments been made to the blocks on offer?

No amendments have been made to the blocks on offer so far, and we are trying to ascertain Libya's exploration potential in frontier areas.

Does the National Oil Company (NOC) have plans for further licensing rounds? If so, when will these take place and which blocks will be offered?

We are reviewing our exploration portfolio and plan to open new exploration rounds before the end of the year. Committed blocks will be excluded and we will issue a new list with open blocks in all our prolific basins. These rounds will be based on open bidding, and we will invite prequalified companies to participate in new bid rounds. An announcement over the licensing rounds will be made at a later date.

What changes, if any, are proposed for the exploration and production sharing agreements (EPSAs)?

We will introduce EPSA IV in our new round. This will cover a new vintage of agreements, with an improved version of our EPSA III. We will introduce new clauses on gas, environment protection as well as other changes to ensure smooth operations in the future.

How are relations between NOC and the US oil companies with assets in Libya?

We are in contact with our US partners and we have no objection to them resuming their operations in Libya. We have agreements covering re-entry and resumption of operations with the firms and we will honour our agreements.

What are the main strategic initiatives that NOC will launch in the coming years?

Our strategic plans will cover the following:

- Improve our production quotas;
- Improve operation methods and field efficiency;
- Replace and utilise gas reserves;
- Develop Libya's potential in refining and chemical industries;
- Train Libyans to operate and manage our oil industry in the decades to come;
- Privatise oil services companies.

We are studying our options and we will make announcements.

MEED's 2nd Mediterranean Gas Congress

A senior NOC representative will be speaking at MEED's 2nd Mediterranean Gas Congress on 23-24 September at the Conrad Cairo, Egypt.
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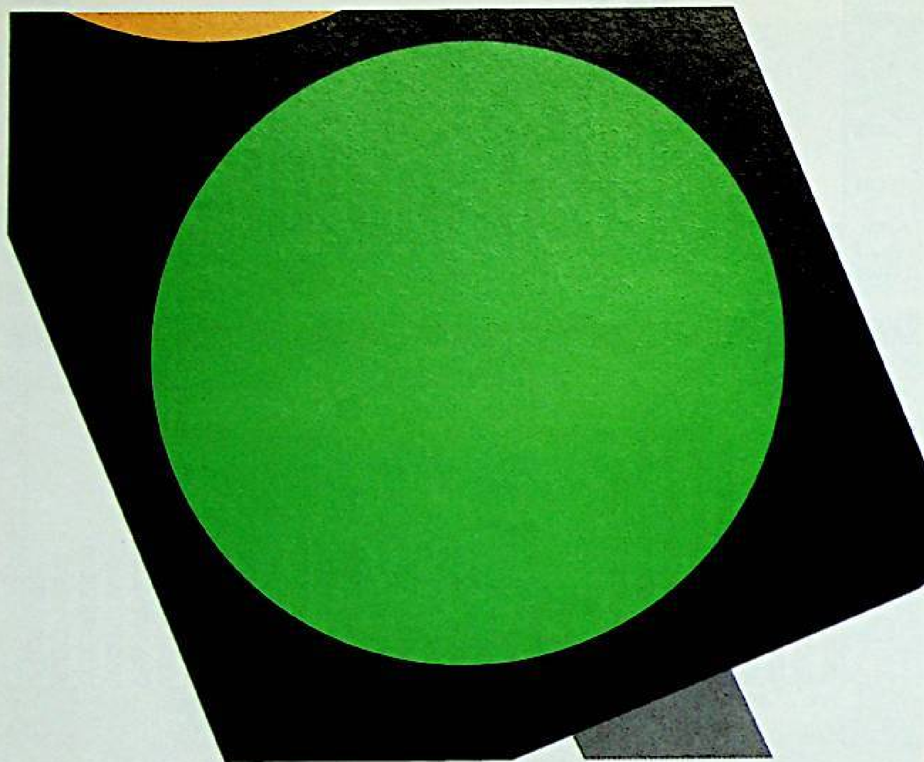
Special Report Libya ■

■ Power

Green light for power contractors



Patience is a virtue – but for those doing business with Libya it is a necessity. And there are few areas where tolerance and flexibility are required more than the country's power sector. For years, companies wanting a slice of the action have been awaiting a signal from the power secretariat – the General Electricity Company of Libya (Gecol) – that the race was about to begin. Few are in any doubt that the wait will be worth it.

Improving power generation capacity is one of Tripoli's top priorities. Electricity demand is growing at a rate of 6-8 per cent each year, boosted by the dual pressures of a growing population and increasing industrialisation. From its present installed generating capacity of 4,700 MW, Gecol has plans to add a further 5,000 MW by 2010. That target will require a minimum investment of $3,500 million. On top of this, Gecol has a $1,000 million programme to reinforce local interconnections and linking the local grid to that of Egypt and Tunisia. In the long run there are plans to develop a grid system servicing the entire African continent.

But the ambitious plans have been dogged by financial delays. Although Gecol in recent years has selected companies for several big-ticket projects, finalising the commercial aspects of the awards has been a protracted affair. Russia's Technopromexport has been waiting since January 2002 for its $600 million turnkey contract to install two 325-MW turbines at the Tripoli West plant. Others too have had to wait.

All that could be about to change. In July, news filtered through to the long-suffering international power contractors that the Gecol budget had finally been approved. The race has well and truly begun. Within weeks of receiving the green light, Gecol signed a $283 million contract with Hyundai Engineering & Construction to expand the Azzawiya plant, 45 kilometres west of Tripoli. Under the terms of the deal, Hyundai will install gas-driven turbines with total generating capacity of 300 MW at the existing 660-MW thermal plant. The award heralds a new era for the South Korean firm. Although it has been active in Libya for several decades, its previous experience in the power sector has been limited to working for the various municipalities, and it has never before worked for Gecol.

Asian and East European contractors look increasingly well-placed to capitalise on Libya's expansion plans

It is also the start of a new phase for Gecol. As the European contractors that dominated the sector in the 1990s withdraw from international bid rounds to mend their balance sheets, it is the Asian and East European contractors that look increasingly well placed to capitalise on Libya's expansion plans.

The exit of Italy's Enelpower from the international scene has reduced the number of serious engineering, procurement and construction (EPC) players in Libya. The Italian firm has cancelled its long-held EPC contract for the 600-MW gas-fired Western Mountain plant and withdrawn from the race to build the 1,400-MW Gulf Steam project near Sirte.

Others have been quick to take its place. India's BHEL, which was ranked second for the Western Mountain project as far back as 1999, is now in the final stages of negotiations with Gecol to build the estimated $175 million plant 280 kilometres southwest of Tripoli.

Grandmother moving

The massive Gulf Steam project, known to some as the grandmother of Libyan power projects due to its longevity in the planning phase, is once again rearing its head. Bids from two firms, France's Alstom and Hyundai, have already been submitted for the frequently-postponed project to build the four-turbine gas-fired plant near Sirte. A further two bids, from SNC Lavalin and South Korea's Daewoo Engineering & Construction, are expected soon.

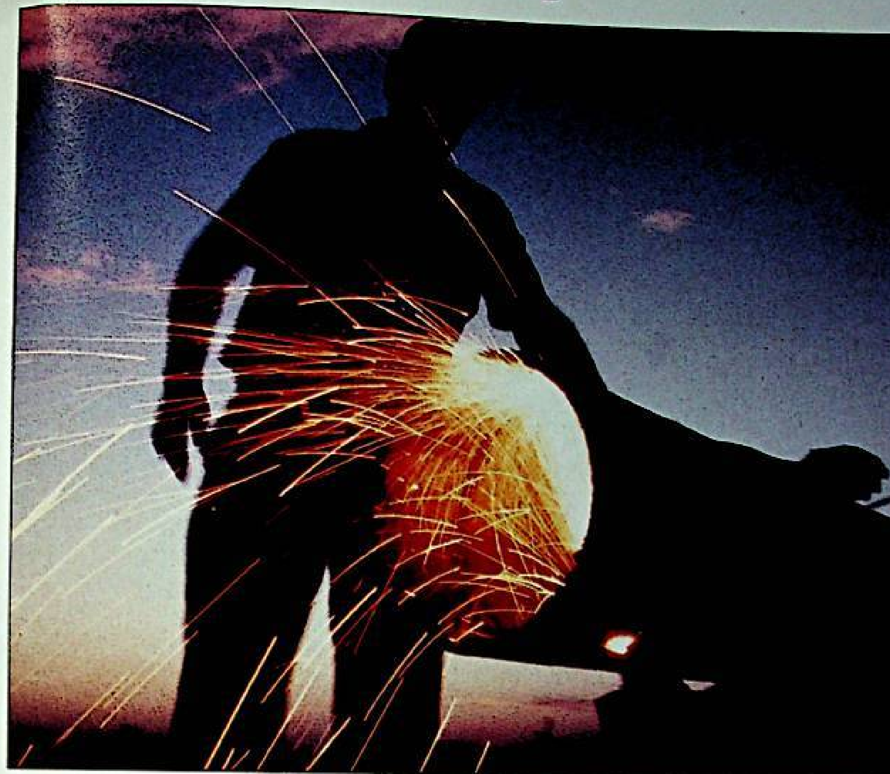
Daewoo, which continues to make frequent appearances on bid lists and was second to Hyundai for the Azzawiya extension, already has its work cut out. It was selected in March as the contractor on the phase-2 expansion of the 600-MW Benghazi North plant. The project, which involves converting the power station to combined cycle from oil-fired, is widely expected to be one of the first schemes to be given the commercial go-ahead by Gecol in the new round of projects.

However, the timetable for the other construction and expansion contracts is less clear. "Although Gecol's budget has been approved, we have no clear indications of the resource allocation for new power projects," says one contractor familiar with the local power sector. "Gecol has so many projects on its books now that completing the preliminary procedures – such as arranging the performance bond, opening the letter of credit and receiving the advance payments – are expected to take some time to organise." As a result, it seems unlikely that construction work on any of the upcoming projects will start before the first quarter of 2004 at the earliest.

But contractors are sanguine about the pace of progress. "We've waited a long time for some of these projects, and a few more months won't hurt," says one. "The main thing is that the power sector has got the green light to proceed. Now we just have to wait and see what happens next."

■ Water

Draining the desert dry



Water is a precious and rare commodity in Libya. Nine-tenths of the country falls within the Sahara desert, and even along the 1,900-kilometre coastal strip, where most of the population lives, annual rainfall rarely exceeds 300 millimetres. Even that meagre volume is decreasing steadily each year, as global climate changes threaten to scorch the coastal plains of the southern Mediterranean countries, turning them into mirror images of their arid interiors.

Although water availability is already among the lowest in the world, demand is increasing steadily, along with the population – and efforts to improve Libya's industrial base. The water requirements of the country's 5 million inhabitants already outstrip supply by more than 1 million cubic metres a year (cm/y). If nothing were done to improve the resource base by 2015, when the population is expected to be 7 million-8 million, the deficit would likely be nearer to 3 million cm/y.

But the authorities are determined to avoid this sorry scenario. For two decades, Libya has been pouring its energy and resources into one of the greatest civil engineering projects the world has ever seen, all in order to ensure sufficient water supplies for future decades of economic growth. The great manmade river (GMR) project is, on paper at least, the stuff of fantasy – a conveyance scheme of colossal proportions designed to tap the prehistoric waters of the Nubian aquifers deep in the south and pipe them thousands of kilometres north to the urban population centres on the coast. However, for those working on the project – and over the past 20 years they have numbered in the 10s of thousands – the reality has been less than fantastic.

Manmade river

Delays, technical problems, corroding infrastructure and financial difficulties have dogged the five-phase scheme. Today, only phase 1 is totally complete, with phase 2 expected to be concluded by the end of the year. Moreover, the two sections are only supplying 25 per cent of their combined capacity, and are not expected to increase production to anywhere near the potential 4.5 million-cubic-metre-a-day (cm/d) level for at least another two-three years.

Libya is now working to increase non-conventional water supplies

However, present supply through the pipelines is more than enough to meet existing levels of demand, insists Bashir el-Saleh, People's Committee member for the GMR Authority (GMRA). "Today, we are providing 450,000 cm/d to Tripoli, 200,000 cm/d to Benghazi and 90,000 cm/d to Misurata, which is more than sufficient to meet the drinking water requirements of the inhabitants of those cities," he says. "Only 32 per cent of the water from GMR is destined for municipal and industrial use – the chief objective of the scheme is to provide water for irrigation, and the only reason that this is not yet the case is that the agricultural projects themselves are not ready yet."

The idea of extracting non-renewable, naturally purified water from underground lakes to irrigate crops is enough to send a shiver down an environmentalist's spine. But it is a price Tripoli is prepared to pay in order to escape its dependency on food imports. "We will of course ensure that the water will be used wisely," says El-Saleh. "We need to get away from the old methods of irrigation and introduce modern techniques such as drip-fed systems and greenhouses to reduce consumption."

GMRA is also aware that it may be able to capitalise on the quality of the water. "We have considered the possibility of bottling water for sale in Europe, and are studying the feasibility of such a project," says El-Saleh. "We have invited a number of companies to make presentations regarding forming a marketing joint venture, but it is not our priority."

Instead, GMRA has its sights set on future phases of the project. Bids were submitted on 20 August for the design, procurement and construction contract for the Ghadames-Zuara network close to the Tunisian border. Over the past few years, the western phase – which involves drilling 106 wells and building pumping stations, storage tanks and a 620-kilometre pipeline – has been given priority over the two eastern extensions: the new Khufra wellfield and the 400-kilometre Jagboub extension to Tobruk. If all goes to plan, an award on the 250,000-cm/d Ghadames phase should be made early next year, allowing the estimated $1,000 million scheme to come on stream in 2007.

Progress has been slower on phase 3. The UK arm of Japan's Nippon Koei, the consultant for the third-phase schemes, submitted the preliminary designs for the 140,000-cm/d Jagboub and 1.7 million-cm/d Khufra phases at the end of last year. Discussions about possible revisions and delays in the wellfield investigations have slowed everything down, with the result that it will be many years before water starts flowing from either.

When the new phases do come on stream, GMRA is confident they will not run into the same technical difficulties that blighted the operation of phases 1-2. "While the project is huge, the technology, other than the control and communications systems, is not tremendously sophisticated," says El-Saleh. "We did have problems with corrosion and the desert environment in the initial stages, but these have since been rectified, and we now have the systems in place to constantly monitor the pipelines and can move to replace them before serious damage is done."

The setbacks and delays have, however, increased the costs of GMR. When the designs were unveiled to the world in 1983, the price tag was $25,000 million and the construction period put at 25 years. Two decades and many billions of dollars later – over budget and overdue – the price advantage of the conveyance system over desalination is becoming less pronounced. The cost of water from GMR is around $0.37 a cubic metre, while improvements in technology, combined with plentiful supplies of subsidised energy feedstock have reduced the cost of similar volumes of desalinated water to $0.65. And with the bulk of production from GMR destined for agricultural use, Libya is now working to increase non-conventional water supplies to supplement the quantities being drawn from the desert wells.

Desalination

Like the GMR, desalination has had a chequered history in Libya. Thermal plants were first introduced in the late 1960s. By 2000, the state-owned General Electricity Company of Libya (Gecol) had overseen the installation of 16 multi-stage flash (MSF) and three multi-effect distillation (MED) plants with total capacity of 413,000 cm/d. However, a lack of desalination expertise – both generally and in Libya particularly – prompted the selection of inappropriate plant designs and inefficient materials and chemical additives. This, combined with the non-availability of much-needed spare parts during the sanctions years, resulted in wide-ranging operational problems that severely reduced the plants' efficiency. By 2000 the few that still functioned were only producing about 142,000 cm/d.

GMR

"Desalination is very much a viable option in Libya"

Sultan Kershman, desalination manager, Gecol

"It is a very different story nowadays," says Sultan Kershman, desalination manager at Gecol. "There has been a technological revolution enabling us to overcome many of the problems we have faced over the past 30 years. Desalination is very much a viable option in Libya today, and will be a vital component in providing domestic water supplies as the population continues to grow."

Indeed, Gecol is now implementing an ambitious $1,000 million programme that calls for the installation of an additional 850,000 cm/d of desalination capacity by 2010. But while the political will may exist to increase non-conventional water resources, the practical process of implementing the programme is proving frustratingly slow. "One of the difficulties we face is that Gecol is required to prepare the plans on a project-by-project basis," says an industry expert close to the scheme. "Each plant is individually approved by cabinet. Only then are the funds made available and the letter of credit [LC] opened – it is a process that requires a certain amount of patience."

For those companies prepared to stay the course, the results can be rewarding. France's Sidem has established a strong working relationship with Gecol. It has installed desalination plants with total capacity of 274,000 cm/d in Libya over the past 30 years and is now preparing to build two more. "It took some time to get the LC for Zuara," says Sidem managing director Gerard Canton. "But we were ready to start work as soon as it was opened and construction of the plant should be completed in 24 months." Sidem's work at Zuara may be extended as Gecol is evaluating the possibility of adding a 40,000-cm/d extension to the plant, effectively doubling its capacity. While the Zuara expansion is under consideration, Sidem is also preparing for work on the 40,000-cm/d Abutaraba plant, 800 kilometres east of Benghazi. The contract has not yet come into force, but Canton is hopeful that the LC will be opened before the end of the year.

Learning the lessons

As Tripoli seeks to increase its desalination capacity, the authorities are keen to ensure the lessons are learned from previous failures. "In the past three-four years, the provision of training, both theoretical and practical, of as many as 60 local technicians has emerged as an extremely important clause in contracts," says Canton. "More recently there is also an emphasis being placed on maximising local content." The requirement to source equipment locally has led to delays on the proposed 250,000-cm/d plant at Tripoli and the 80,000-cm/d plant at Misurata. However, Gecol is confident the process will reap rewards in the long run.

The requirement to incorporate local involvement in Libya's desalination programme is an understandable move, and is part of a process that is gaining acceptance across the world. It is not only a political statement, it is a very practical move. "Desalination is a growing necessity in Libya," says Kershman. "Establishing a base for manufacturing equipment will not only enable us to keeps costs down, but will also play an important part in developing the local industrial sector and so contribute to the wider economic development of the country as a whole." ■

New desalination projects

Project	Capacity (cm/d)	Process	Use	Status
Tobruk	3x13,333	MED+TVC	Domestic supplies	Sidem has been awarded the contract
Benghazi North	2x2,500	MED	Captive	Daewoo has been awarded the contract for the power plant
Zuara	3x13,333	MED	Domestic supplies	Sidem has been awarded the contract, and is in discussions with Gecol to double the capacity
Gulf Steam	2x10,000	MED	Captive	Proposed plant will be part of the long-delayed Gulf Steam project
Abutaraba	3x13,333	MED	Domestic supplies	Sidem due to start construction soon
Tripoli	8x31,500	MSF	Domestic supplies	Delayed
Zawia combined	2x2,500	MED	Captive	Hyundai has been awarded the contract for the power plant
Zawia II	80,000	MED+TVC	Domestic supplies	Gecol preparing tender documents
Homs extension	30,000		Domestic supplies	Planned
Zliten extension	2x10,000	MED	Domestic supplies	Gecol preparing specifications
Sirte extension	20,000	MSF	Domestic supplies	Offers under evaluation
Sussa extension	20,000		Domestic supplies	Planned
Dema extension	30,000		Domestic supplies	Planned
Misurata	80,000	MSF	Domestic supplies	Delayed

cm/d=cubic metres a day; MED=multi-effect distillation; MSF=multi-stage flash; TVC=thermal vapour compression
Source: Gecol

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