



Seeing the broader picture

Taking a holistic approach drives business improvements for Petrotrin and Ecopetrol

Petrotrin, Trinidad and Tobago's state petroleum company, has been successfully operating the Pointe-à-Pierre refinery for 12 years and even more effectively since the completion of its technological upgrade in 1997. However, in early 2003, Wayne Bertrand, president of operations, Petrotrin, was faced with the prospect of increased competition because of regional tax regime changes.

Fundamental transformation was required because, even with the improvements that had been achieved over the years, the performance of the company's refining operation remained in the fourth quartile. Change was necessary to ensure a safe and profitable future for the refinery. Bertrand, therefore, looked at areas for improvement, including reducing unplanned shutdowns; improving plant operations to deliver higher margins; reducing operating costs; cutting lost time due to injuries; and improving compliance with environmental regulations.

These were similar to the issues facing Ecopetrol in Colombia in early 2001. The company was experiencing increasing foreign competition; had high energy costs caused by gas flaring and high fuel

consumption in process boilers and furnaces; and was unable to export valuable products to the gasoline-depleted US market because of increasingly strict legislation on fuels. The vice president, Felipe Castilla, also faced the challenge of a highly unionised workforce, which meant that any significant changes he required would demand strategies and actions that were focused on promoting new attitudes and behaviour in people.

While new technology and operating procedures can enhance business performance, it is often the way that they are applied that makes the difference. Through its operating experience, the Shell Group has found that people have

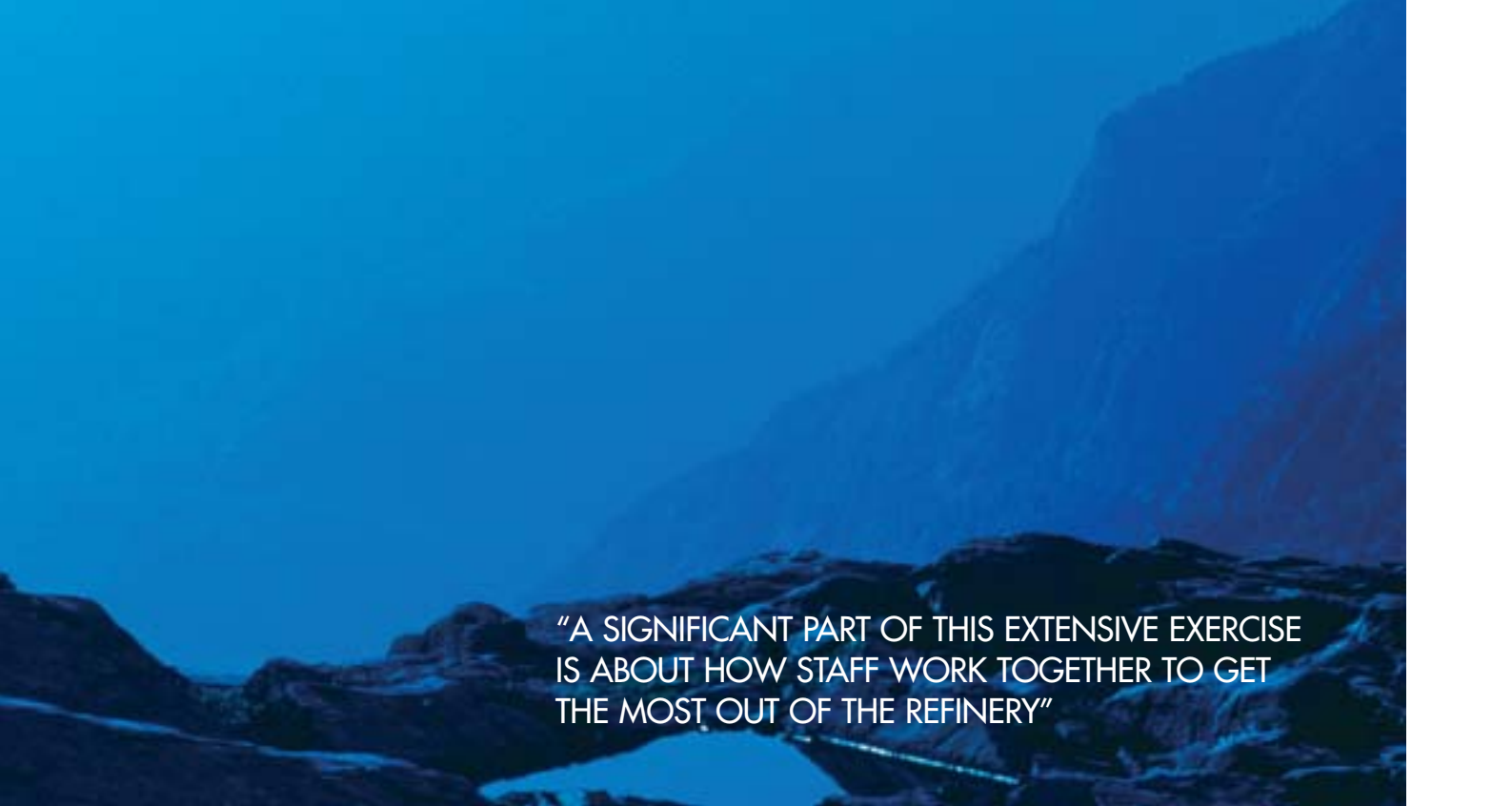
“LEADERSHIP DEVELOPMENT IS PARTICULARLY IMPORTANT, AND ORGANISATIONS MAY NEED TO RESTRUCTURE AND REASSIGN ROLES AND RESPONSIBILITIES”

a massive role to play in sustaining radical improvements; attitude and behaviour are key to success. For this reason, change management is high on the agenda of the integrated programmes in which Shell Global Solutions gets involved.

People are not always convinced that change is possible or that it can benefit them personally, so the process of change begins by going beyond the logical and rational aspects to address the emotional and political concerns of the people in an organisation. Staff capabilities need to be assessed and training requirements considered. Leadership development is particularly important, and organisations may need to restructure and reassign roles and responsibilities. All these factors have a huge impact on individuals and need to be handled with sensitivity.

On the political front, it is important to ensure the alignment of all the stakeholders. The management, the

workforce, the unions and the shareholders (which often include governments) all need to trust each other and have a common understanding of what is needed to move forward. An effective internal communication



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programme is, therefore, vital to the success of these initiatives.

Last year, Petrotrin set out on a five-year programme to transform its business. Bertrand considers the progress so far: “A significant part of this extensive exercise is about how staff work together to get the most out of the refinery. It requires them to have a common focus and to understand exactly what is important for the business. We are helping by making it clear to people how they add value to the business and by supporting them as they work to build a dynamic, winning team.

“With a heavily segmented programme, it is easy to concentrate, for example, on the maintenance process or a distinct part of your operations and come up with ideas for reducing costs or raising revenue. But in any business it is often a combination of elements that really makes the difference. It is critical to understand how the discrete activities fit together in order to deliver value efficiently.”

Companies often have quite distinct working cultures, relationships and organisational structures. Success is about breaking down the boundaries between

people rather than them working with a silo mentality. This is actually quite difficult because fear of the unknown creates a barrier. Bertrand adds, “A key element of the programme has been workshops to enable staff to understand that this is an opportunity not only to improve business performance, but also to make it a more enriching experience to come to work. The Shell Global Solutions team has engaged with people at levels from director to plant operator.

“At the end of the programme, we expect a net margin improvement of 70¢ per barrel,” says Bertrand. “It is also worth highlighting the strong health, safety and environment component of the programme; we are looking forward to a significant reduction in our lost-time-injury frequency as a result of our combined efforts.”

Ecopetrol is now four years into a six-year major improvement programme. Castilla believes that the greatest achievement to date has been the shift in the company’s working culture. He says, “Cultural change is taking place at both refinery operations and corporate levels.

We are now focused on priorities that enable us to take a more global approach. Our target for margin improvements for 2005 was 105¢ per barrel, and we actually achieved 108¢ per barrel.”

From experience of working with Shell operations, Shell Global Solutions has found that it can be easy to lose sight of the bigger picture when pursuing a series of discrete activities in different parts of a business. The compatibility of the various projects is an important consideration, not only in a technical sense but also from the viewpoint of the resources that they require. The greatest benefits are often found at the technical and operational interfaces that abound in complex manufacturing organisations. As has been demonstrated in the Petrotrin and Ecopetrol programmes, taking a holistic approach to capturing opportunities can deliver far more than the sum of the individual efforts.

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China's energy needs rise up the global agenda

China's increasing energy needs dominated discussions in both economic and political circles throughout 2005. High-profile events across the globe brought together politicians, scientific advisers, academics and industry leaders to debate how the energy question will impact on the country's social and economic development.

A dependence on coal, together with growing environmental concerns, poses significant challenges. Industrialisation and urbanisation are accelerating as the country seeks to support both domestic development and the increasing number of manufacturers who are moving their businesses to the region. And, in a country where vehicles currently account for 80% of petrol consumption and 30% of diesel consumption, 100 million additional cars are expected to hit the streets by 2030.

Liu Jiang, vice-chairman of China's National Development and Reform Commission, highlighted his country's onerous task at a round-table event in London earlier this year where energy and environment ministers from 20 countries considered the challenge of creating lower-carbon energy systems. "There is no precedent that one country can realise a high level of per-capita GDP while at the same time maintaining a very low level of per-capita energy consumption.

"Thus, it is a challenge for China to blaze a trail in building a mode of consumption and production in line with sustainable development. To resolve problems brought about by climate change, we should promote technology development and transfer through innovation and reform,



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which will lead to the breakthrough of solutions,” concluded Jiang.

Linda Cook, executive director, Shell Gas & Power, confirms China’s predicament: “The Chinese government has set a target to quadruple its GDP between 2000 and 2020, while at the same time increasing its energy demand by only a factor of two. The government is to be commended for setting this target. But there is no doubt it will be a tough challenge.”

China is now one of the few nations in the world that relies on coal as its major energy source. Coal amounts to 67% of its primary energy consumption, albeit coming from large domestic reserves, and the IEA World Energy Outlook predicts that this figure will fall to 57% by 2030.

Cook highlights that diversifying sources of energy supply and balancing economic needs with environmental considerations are key to meeting future challenges. She says, “Coal gasification offers one potential route to using these resources more cleanly and efficiently. And advanced technologies, which international companies have wide experience of applying, can enhance recovery from mature oilfields.”

Shell Global Solutions’ technology has already been licensed for a range of applications, including a 2000-tonne-a-day coal gasification plant in Hunan Province. The plant is being constructed as part of a joint venture with Sinopec, and will supply syngas as feedstock to a fertiliser plant.

Cook also says that combined-cycle gas turbines can provide the opportunity for electricity generation that results in half

the carbon dioxide emissions of the best conventional coal plants.

“It is good that China aims to use much more natural gas. But, with domestic sources insufficient to meet the demand, the country must rely on imported supplies. It is in the middle of the world’s most developed and fastest growing LNG market, with a range of potential suppliers in Asia and the Middle East.”

A law on renewable energy was formally enacted in February 2005 to reinforce existing government support for the development and utilisation of new and renewable energy types such as biogas, solar, wind and geothermal. Plans for the development of nuclear power have also been accelerated.

Cook also points to the development of other alternative energy technologies as a feasible way forward. “In a world of high oil prices, and with current technological advances, there is also a potential role for synthetic fuels – using gasification combined with the Fischer–Tropsch process to turn gas, coal or biomass into high-quality liquid fuels.”

Major coal companies already have projects under way to explore the potential for combining coal gasification and Gas-to-Liquids (GTL) technologies to produce clean liquid fuel from coal. China’s largest coal mining group, Shenhua Group Corporation, has licensed Shell technology for the manufacture of hydrogen at a pioneering coal liquefaction plant in Inner Mongolia.

And back on the busy roads, Shell Gas & Power is already working with the Shanghai Pudong Bus Transportation

Company to trial a blend of GTL and standard diesel fuels. The possibility of reduced air pollutant levels, compared with the levels generated by conventional fuels, would be a welcome boost in a country that has 20 of the world’s 30 most polluted cities.

Improving energy efficiency also has a major part to play. Anil Terway, an energy specialist with the Asian Development Bank, used an international summit organised by the China Institute of International Studies to highlight the factors driving the focus on energy efficiency in China. These included economic costs, as rising energy costs impact on consumers and the competitiveness of China’s industries; a growing awareness of the environmental impact of the dependence on coal; the security of energy, with oil import levels potentially reaching 50% by 2010; and an increased exposure to international practices and consumer demands.

Cook concludes, “The world’s average energy efficiency is generally about half what it could be if only the best available technology were used. Improvement is slow because of the longevity of installed equipment in energy-intensive industries. In China, the average may be even lower.

“But the pace of development provides the opportunity for much quicker advance. As we expect the nation to double its power generating capacity by 2030, deciding to use only the best available technologies would make a major difference.”

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Effective remedy

Clean-up at Philippine oil terminal site provides amenity for local communities

Pilipinas Shell Petroleum Corporation has operated a facility at the Pandacan oil terminal in Manila, the Philippines, since the early 1900s. The Shell facility is a major oil products terminal and between the 1950s and 1994 was used for the formulation of crop protection products.

Although the oil terminal site was isolated when it was originally constructed,

community was to be turned into a park – an amenity for the local communities.

The project at the Shell terminal involved removing the liquefied petroleum gas storage tanks, reducing the number of oil storage tanks and demolishing various structures.


The Shell Chemicals Crop Protection Programme team was in charge of the

Philippines; the regulatory guidelines for this type of work are still being developed. To ensure the transparency and technical acceptability of the work, an independent expert health panel was set up.

The National Institutes of Health at the University of the Philippines were asked to appoint the panellists, who included academic and government environmental, toxicology and health specialists. Shell Global Solutions worked with the health panel so that they had all the information required to evaluate the reports generated during the work.

“As project manager, Shell Global Solutions applied international best practice in developing the corrective action plan. The health panel, representing a range of external stakeholders, was brought in to review and challenge our proposals,” says Tony McCrae, who runs Shell Chemicals’ Crop Protection Programme. “Shell Global Solutions helped to effectively manage the project to a successful conclusion.”

The local community is now enjoying the park. Previously, the area was very densely populated with no open spaces – the park provides an open space with seating areas and basketball and tennis courts. “Pilipinas Shell’s project was well managed and has resulted in a recreational facility, valued by the community, that is suitable for use in the longer term,” concludes McCrae.



“THE REMEDIATION PROJECT WAS THE FIRST OF ITS KIND IN THE PHILIPPINES; THE REGULATORY GUIDELINES FOR THIS TYPE OF WORK ARE STILL BEING DEVELOPED”

over the years more and more houses have been built around the area, and now the residential development has reached the perimeter fence.

The Philippine government became concerned about safety in the area of the oil terminal and felt it to be a potential terrorist target, especially in the wake of the attacks in the USA in September 2001. The government asked the three oil companies that were operating at the site to modify operations at their depots and create a buffer zone between the site and the residential area. Part of the buffer zone between the oil terminals and the

remediation programme, as the site falls within its remit. A dedicated team, with members from the UK and the Philippines, oversaw the robust implementation of the project. Shell Global Solutions managed the technical side of the project, and consultants from its health, safety and environment group managed the process for the investigation, assessment and remediation of the site.

The team also helped to make sure that the work was undertaken to internationally acceptable standards. The remediation project was the first of its kind in the

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