
6. INDUSTRY OVERVIEW

6.1 INTRODUCTION

The Perisai Group is involved in the manufacturing, supplying, commissioning and installation of corrosion control products as well as the inspection and maintenance of pipes, pipelines, risers and heat exchangers primarily for the oil and gas industry. Accordingly, the market for the Group's products and solution is dependent on both the upstream sector (offshore platforms) and downstream sector (onshore pipelines, refinery installations and petrochemical complexes) of the oil and gas industry.

Further, apart from servicing oil and gas facilities in Malaysia, the Group also provides corrosion control products and solutions to overseas oil and gas facilities, particularly to Brunei and Indonesia. Accordingly, the market for the Group's corrosion control products and solutions is dependent on the performance of the petroleum industry in Malaysia, Brunei and Indonesia.

6.2 OVERVIEW OF THE GLOBAL ECONOMY

Macroeconomic stimuli, inventory dynamics and a stronger turnaround in the high technology markets are expected to set the stage for a wider recovery through the traditional channels of international transmission. With global trade steadily increasing, and interest rates at historically low levels, the global economy is poised for a gradual recovery. Lower interest rates helped keep the consumers' demand for durable products strong. Together with fiscal easing, that demand should provide support for an economic rebound in the USA, and to a lesser extent in some Asian and European countries. The recovery in the global markets is shaped primarily by the developments in the industrial countries. If corporate spending on IT investments in the USA, Euro Area and Japan does not pick up towards the end of 2003 due to weak business confidence, then the global recovery could be delayed until 2004. Therefore, both the world economy and global trade are anticipated to improve, moving forward into 2005.

Uncertainties, especially geopolitical ones, are keeping investors cautious, throughout most parts of the world. In the developing countries, investment behavior has become a key element of the outlook. They are especially vulnerable to jitters in the financial markets. Sudden reversals in capital flows can dampen investments sharply and weaken the growth momentum. Hence, countries with strong policies in place are more likely to avoid or smoothly absorb external financial shocks. The downside risks to the forecasts include the emergence of other flash points in the Middle East, terrorist reprisals, the USA economy slows down markedly, the USD declines too sharply and the further weakening of the Japanese economy. A weakened USD would translate into slower demand for imported goods into the USA, with repercussions for the Asian export-oriented economies. Japan remains an important trading partner and a source of capital for many of the neighboring Asian countries, not withstanding its prolonged economic weakness. Hence, its economic performance has a direct effect on its neighbors.

(Source : Frost & Sullivan Report dated April 2004)

6.3 OVERVIEW OF THE MALAYSIAN ECONOMY

While events in the first half of 2003 had an impact on growth, the mutually reinforcing combination of strong economic fundamentals, supportive monetary and financial policies and decisive Government action provided the platform for growth to accelerate in the second half. For 2003 real GDP expanded by 5.2% (2002: 4.1%), exceeding the official forecast of 4.5%.

Growth in 2003 was broad based and balanced across sectors. The manufacturing sector grew by 8.2% on the back of strong production growth, both in the export-oriented and domestic-oriented industries. Export-oriented industries, particularly the electronics and chemicals industries, benefited from the recovery in the global electronics sector as investment demand picked-up in most major economies. This growth was also seen in the strong expansion in manufactured exports (8.2%) and capacity utilisation levels that exceeded 80%. In certain industries, the 90% utilisation level was breached in 2003, prompting an increase in capital expenditure.

6. INDUSTRY OVERVIEW *(Cont'd)*

The Malaysian economy is expected to strengthen further in 2004, building on the strong growth momentum in the second half of 2003 and brighter prospects for global growth in 2004. Real GDP is expected to expand by 6-6.5% (2003: 5.2%), underpinned by stronger domestic demand and reinforced by more favourable external demand. Growth will mainly be private sector-driven, while the public sector gradually consolidates. The growing consumer and business confidence since the second quarter of 2003, strengthened economic fundamentals and the positive impact of pro-growth fiscal and monetary measures are expected to mutually reinforce robust consumer spending and the upturn in private investment activities.

(Source: Bank Negara Malaysia Annual Report 2003)

6.4 OVERVIEW OF THE MALAYSIAN OIL AND GAS INDUSTRY

Malaysia has around 500,000 square kilometers of acreage available for petroleum exploration, of which 205,500 square kilometers (41.1%) are currently covered under the terms of the PSC. Due to its monopolistic and privileged status in the upstream oil and gas sector, PETRONAS entered into the PSCs mostly under terms that are beneficial to the company. The PSCs are normally undertaken with a number of petroleum multinationals and each contract obligates the contractor to provide all the financing and bear all the risks of exploration, development and production activities, in exchange for a share of the total production. Out of the 123 oil fields discovered, there are 47 producing oil fields currently. In 2002, daily production of crude oil and natural gas amounted to 698,000 barrels and 131.7 million cubic meters, respectively. At the current pace of production, the reserves of crude oil and natural gas are expected to last for around 13 years and 54 years, respectively. The importance of the petroleum industry can be seen from the fact it contributes more than 9 percentage points to the country's GDP. Ongoing and future production projects in the upstream sector in Malaysia are expected to amount to RM11.2 billion through 2005. In South-East Asia, ongoing and future pipeline projects are projected at approximately RM18.6 billion through 2009.

The natural gas production from the gas fields offshore Terengganu is delivered to the gas processing plants in Kerteh. Subsequently, the processed natural gas is then delivered by pipeline as fuel to the end-users, which include households, manufacturers and power companies, as well as feedstock to petrochemical, ammonia and urea plants in the peninsula. Meanwhile, the natural gas production from the gas fields offshore Sabah is transported to the processing plant on Labuan Island, and subsequently to the methanol plant as feedstock and the direct reduced iron plant as fuel. Lastly, natural gas production from the gas fields offshore Sarawak is channeled to the three liquefied natural gas plants as well as the ammonia and urea plants in Bintulu, Sarawak.

In July 2002, Murphy Oil Corporation, an independent contractor working for PETRONAS struck crude oil in 1,340 meters of water 150 kilometers in the Baram Delta off the coast of Sabah. The field has an estimated recoverable reserve of up to 700 million barrels, or nearly 21% of the country's current crude oil reserves. The country has the 12th largest gas reserves and 27th largest crude oil reserves in the world.

(Source : Frost & Sullivan Report dated April 2004)

Crude oil production (excluding condensates) rose by 5% to 625,800 barrels per day (bpd) compared with 2002, close to the year's production target of 626,000 bpd under the National Depletion Policy. The increase in production during the year was driven by increased domestic demand for petroleum products and higher external demand, particularly from India, Australia, Thailand, People's Republic of China and US, which together accounted for about 65% of Malaysia's total export of oil. Exports to these countries increased by 34% during the year. Higher output emanated from existing oil fields as well as four new oil fields that came on stream during the year. The increase in export volume and sharply higher export prices (22%), lifted gross receipts from crude oil exports by 35% to RM15.7 billion (2002: RM11.6 billion), to account for 4% of gross exports.

Natural gas production expanded by 5.2% in 2003 as the sector was able to respond to the higher demand given an increase in production capacity, especially with the commencement of the Malaysian

6. INDUSTRY OVERVIEW (Cont'd)

Liquefied Natural Gas (MLNG) Tiga plant in May 2003 and the coming on stream of four new gas fields during the year. Domestic demand remained favourable, particularly from the power generation sub-sector, which consumed 66% of total domestic gas production. Higher offtake by all Liquefied Natural Gas (LNG) buyers, namely Japan, Korea and Chinese Taipei as well as the increase in export prices (RM766 per tonne; 2002: RM659) led to the sharp increase of 34.8% in export receipts generated from LNG.

(Source: Bank Negara Malaysia Annual Report 2003)

6.5 OVERVIEW OF THE BRUNEI OIL AND GAS INDUSTRY

The economy of Brunei is heavily dependent on the petroleum industry. It generates between 75 percent and 90 percent of the government's revenues and accounts for slightly more than 50 percent of the GDP. Reserves of crude oil and natural gas were estimated to be around 1.35 billion barrels and 391 billion cubic meters, respectively in 2002. In the same year, daily output amounted to 197,300 barrels of crude oil and condensates, and 30 million cubic meters of natural gas. The petroleum industry in Brunei is also venturing into deep water exploration activities, due to the maturing of existing fields. In an effort to create more value added products, the Brunei government is also encouraging the development of large-scale petrochemical projects, to take advantage of the huge natural gas reserves in the country.

Brunei Shell Petroleum Company spends an average of USD10 million on atmospheric corrosion control per annum. Approximately 50 percent of the costs are channeled into offshore structures, while the remaining into onshore installations. However, the figure spent on atmospheric corrosion control products varies from year to year as it is very project specific and is also a function of the urgency of the remedial actions needed.

(Source : Frost & Sullivan Report dated April 2004)

6.6 OVERVIEW OF THE INDONESIAN OIL AND GAS INDUSTRY

In 2002, Indonesia has crude oil reserves and natural gas reserves of around 5 billion barrels and 2.6 trillion cubic meters, respectively. Daily production amounted to about 1.25 million barrels of crude oil and 86.1 million cubic meters of natural gas in 2002. In spite of its huge petroleum reserves due to its geological factor endowments, Indonesia is viewed as being beleaguered by issues of regulatory enforcement, taxation, labor disputes, political stability, native land claims and forced socio-economic contributions outside the regular taxes. In addition, Indonesian waters suffer the dubious reputation of being subject to the highest number of piracy incidents, as reported by the International Maritime Bureau. This affects the passage of merchant ships through Indonesian waters, and ultimately, docking at Indonesian ports that have the potential to generate the demand for atmospheric corrosion control products, through maintenance and repair.

It is estimated that Indonesia's petroleum industry spends around USD10 million per annum on atmospheric corrosion control. It is also subjected to budget constraints and is a function of the urgency of the remedial actions needed on the part of the petroleum corporations. CSSB markets its products directly to the end-users in the Indonesian market.

(Source : Frost & Sullivan Report dated April 2004)

6. INDUSTRY OVERVIEW (Cont'd)

6.7 OVERVIEW OF THE CORROSION CONTROL PRODUCTS INDUSTRY**6.7.1 Market size**

In the global petroleum offshore platform market alone, the demand is projected conservatively at RM5.9 billion, based on the estimated 5,848 platforms in the world. In Malaysia, the market for atmospheric corrosion preventive products was estimated at around RM120 million (USD31.6 million) in 2002. The market is anticipated to increase dramatically, to reach RM201.2 million in 2008, yielding a compound annual growth rate of 8.9%. In Brunei and Indonesia, the market for atmospheric corrosion preventive products was estimated at around USD10 million each, in the same year.

(Source : Frost & Sullivan Report dated April 2004)

6.7.2 Industry player and competitions

The market size for atmospheric corrosion products was mainly computed based on the number of oil and gas platforms and onshore installations. Of the total market size for atmospheric corrosion control products of approximately RM120 million in 2002, CSSB had a market share of approximately 9%. The rest of the market is accounted by the various paints and coatings companies, which are not direct competitors to CSSB's range of products and solutions. Some of the more prominent companies supplying paints and coatings to the petroleum industry include:

- (i) Jotun (M) Sdn Bhd
- (ii) Nippon Paint (M) Sdn Bhd
- (iii) Sime Leigh Sdn Bhd
- (iv) International Coatings Sdn Bhd
- (v) Corrocoat Corrosion Services Sdn Bhd
- (vi) Chugoku Paints (M) Sdn Bhd
- (vii) Dimet (M) Sdn Bhd
- (viii) Hempel (M) Sdn Bhd
- (ix) DNT (M) Sdn Bhd

(Source : Frost & Sullivan Report dated April 2004)

However, it should be noted that this survey was conducted based on CSSB's industry position prior to the conclusion of the Master Service Agreement and the award of the individual contracts from PETRONAS' PSC contractors, namely, *inter alia*, Carigali, ExxonMobil, Shell and Nippon Oil for the provision of corrosion control services in May / June 2003.

[The rest of this page is intentionally left blank]

6. INDUSTRY OVERVIEW *(Cont'd)*

6.7.3 Barriers to entry

There is a high barrier to entry, principally in terms of proprietary product technology. The design characteristics are kept proprietary through patents that typically last around fifteen years in Malaysia. Also, a company must be appointed by PETRONAS under the VDP in order to venture into the petroleum industry. In addition, the atmospheric corrosion control market is unique in the sense that there is a very high ratio of fixed costs to variable costs. Fixed costs include warehousing facilities, rentals, R&D costs, salaries and plant and machinery. On the other hand, the variable costs include offshore allowances, cost of material inputs and transportation charges for product installation. The sunk costs may be unrecoverable if a market participant decides to leave the market. There is no main exit barrier in the corrosion protective industry.

(Source : Frost & Sullivan Report dated April 2004)

Under the VDP, CSSB has a monopoly for the supply and installation of corrosion protection systems on all fasteners, flanges, riser clamps and pipe supports on Carigali's offshore platforms and those of PETRONAS' PSC contractors, offshore facilities in Malaysia as well as operations owned by PETRONAS or its subsidiaries. Although awarded under the VDP scope on 25 May 2000, the full implementation of the Vendor Status came much later upon the conclusion of the Master Service Agreement and the award of the individual contracts from PETRONAS' PSC contractors, namely, *inter alia*, Carigali, ExxonMobil, Shell and Nippon Oil for the provision of corrosion control services in May / June 2003. The Master Service Agreement provides the basis of the said contracts between PETRONAS' PSC contractors and CSSB. Each contract is signed for a duration of 3 plus 2 years from the date of the respective contracts.

6.7.4 Relevant law and regulation governing the industry

PETRONAS was incorporated in 1974 as the country's national petroleum company to develop the nation's petroleum resources, the ownership of which has been vested in the company by the Petroleum Development Act 1974, and to participate in the refining, manufacturing and marketing of petroleum products as provided under the same Act. The monopolistic status in the upstream operation, based on the same Act, is expected to remain in the foreseeable future. As the sole shareholder, the government controls the approval of all corporate matters under the Malaysian Companies Act, including the approval of dividends and the appointment of directors. Also, the same Act stipulates that the company is subject to the control and direction of the Prime Minister, making the company's management potentially affected by government policies. However, the government has provided the company with adequate latitude to manage itself based on commercial principles and will likely be the same for the foreseeable future.

Both the operators and contractors, as well as their subcontractors, are subject to the Occupational Safety and Health Act, 1984. This Act is enforced by the Department of Occupational Safety and Health, a department under the Ministry of Human Resources. Under this Act, employers have the duty to ensure, as far as practicable, the safety, health and welfare at work of all his employees. This includes the provision of plant and systems of work that are, so far as is practicable, safe and without risks to health. Both safety and absence of risks to health in connection with the use or operation, handling, storage and transport of plant and substances must be present. The employers must also ensure the provision of such information, training and supervision as is necessary to ensure, as far as is practicable, the safety and health at work of his employees.

In environmental issues, both the Environmental Quality Act, 1974 and the Exclusive Economic Zone Act, 1984 apply to the offshore petroleum industry. The Department of Environment comes into play if the petroleum activities are within the territorial waters of Malaysia. If activities take place beyond the territorial waters, that is, the economic exclusive zone, then both PETRONAS and the Ministry of Domestic Trade and Consumer affairs have

6. INDUSTRY OVERVIEW (Cont'd)

regulatory control over the environmental aspects of offshore operations. The territorial waters are defined as situated within twelve nautical miles from the coast. The maritime zone adjacent to the territorial water may not extend beyond 200 nautical miles from the baselines from which the breadth of the territorial waters is measured, under the framework of the United Nations Convention on the Law of the Sea, which entered into force in 1994. Besides these national environmental regulations, international agreements do apply, as well as voluntary measures in the form of codes of practice.

(Source : Frost & Sullivan Report dated April 2004)

6.7.5 Substitute products and solutions

There are many corrosion control methods available and they include protective coatings, corrosion-resistant metals and alloys, corrosion inhibitors, polymers and anodic and cathodic protection. Protective coatings comprise galvanising and metallising. Stainless steel, nickel-based alloys and titanium alloys are also used for corrosion control purposes. Paints and coatings are the most common form of corrosion control substitute. However, they are more suitable for short-term remedial purposes, due to the hostile marine or near-marine environment, with saltwater being the main corrosive agent. Some substitutes require the suspension or shutting down of production during the remedial or repair phase. This translates into expensive downtime, as the petroleum operators are obliged to produce a certain quantity of petroleum per day. The selection of a particular technique of atmospheric corrosion control is dependent on a number of factors, like the intended service, application, planned service life and cost.

The details of Perisai's products and their advantages are listed below;

Products	Substitute	Advantages of Perisai Group's products
Corro-Cillin™	Grease or paint	Grease has the tendency to dry up making it ineffective in the long term and does not offer inspectability, a key criteria, for protection systems. Paint is not effective on nuts, bolts and flanges as it is impossible to have access to carry out good surface preparation for the paint to be effective.
CS 85MP™	Grease or paint	As above
CS 105MP™	Grease or paint	As above
CorroCap™	Traditional coating	Although the life of these nuts and bolts can be extended by protective coatings and paints, this is a difficult task due to the odd shapes of the nuts and bolts and their inaccessibility to inspection and service. Traditional coating products such as anti-corrosive paints and red lead primers are environmentally harmful and thus, the removal and disposal of these products are a complex and expensive part of any maintenance project and requires specialist advice, equipment and procedures resulting in high costs. For health, environmental and safety reasons, the use of these products are being reduced gradually.

6. INDUSTRY OVERVIEW (Cont'd)

Products	Substitute	Advantages of Perisai Group's products
	Fluorocarbon coating	Fluorocarbon coating is vulnerable to mechanical damage or rough handling which is difficult to avoid during the installation of the bolts and nuts which ultimately results in failure of the protective coating.
FlangeShield™	- Caulking - Tape wraps	Caulking is a process whereby anti-corrosion material in the form of a paste or putty is inserted in between of pipe flanges to prevent corrosion. Nevertheless, the caulk does not bond to the steel and thus form a tight crevice which retains water through capillary action. Caulking seal prevents natural evaporation and exacerbates the problem. This system provides no inspectability. The use of tapes alone does not prevent galvanic corrosion from taking place and very often these tapes have limited life and require replacement and routine maintenance.
Riser Clamp Shield™	None	
Fibaroll	- Stainless Steel and Aluminium Cladding Systems - Clock Spring and Armour Plate Wrap	This system is susceptible to crevice corrosion and water ingress when the stainless steel cladding is damaged or dented leading to accelerated coating failure. It is expensive, requires routine maintenance and does not allow inspectability. The Clock Spring Sleeve and Armour Plate Wrap are specially developed high strength composite material. Its unique coilshape allows the Clock Spring to wrap tightly around pipe of virtually any size. Applied with a fast-curing, yet incredibly strong adhesive, it forms a composite wrap which actually exceeds the yield strength of the original pipe. Once installed, the Clock Spring and Armour Plate Wrap form an extraordinary strong and durable repair. However, these systems are expensive (at least 4 times more expensive than Fibaroll's solution) and do not have the unique all in one system of adhesive and glass reinforced plastic laminates which Fibaroll has.

6. INDUSTRY OVERVIEW (Cont'd)

Products	Substitute	Advantages of Perisai Group's products
Composite Sleeve Repair	- Hot Tapping and Heavy Duty Metal Connector	Permanent repair or rehabilitation of oil and gas pipeline and riser can be very costly due to the use of expensive technology like hot tapping and heavy duty metal connector. Worst of all, the repair using the above techniques involve cutting and replacing parts of the risers and pipes and therefore require the shutdown of operations which results in costly operations downtime.
Marine Growth Impactor	Marine Growth Remover ("MGR")	The cleaning part of the MGR of the single competitor (IEV Group) is made from steel and is designed to scrape the marine growth from the piles. This has been proven to be undesirable as it causes damage on client's existing coatings. The Group's product uses plastic parts and derives the mass from the water entering the chamber to cause an impact action to remove the calcareous marine growth and is more cost effective and safer than the competitor's product.
Marine Growth Pile Protector	Marine Growth Preventor (MGP)	The competitor's product uses bristles and is modular unlike the Group's product which uses rubber rollers and is one single fused unit. The Group's product has proven more durable as it is a single unit unlike the modular unit of the competitor's which based on feedback from client's has the tendency to break at the modular joints.
CIT1Shield™	- Use of pre-fabricated plastic, ceramic or nylon inserts - Internal coating	The weaknesses of using pre-fabricated plastic, ceramic or nylon inserts or internal coating are that they do not restore the tube back to original structural integrity and in the case of coating, it is practically impossible to coat the internal part of the tube effectively and therefore does not effectively deal with the problems posed by corrosion. The use of plastic, ceramic or nylon inserts also promotes end step corrosion (i.e. corrosion which occurs at those areas within 6 inches from either or both ends of the tube), a phenomenon which occurs due to the heavy walls of the inserts.
BioSolve®	None	

6.7.6 Industry reliance and vulnerability to imports

Most of the global suppliers of atmospheric corrosion protection products and solutions are either European or American companies. However, CSSB, being a Bumiputera company, is given priority in the petroleum industry by PETRONAS in its vendor development program, as part of the government's efforts to build and develop a strong indigenous business community. In this context, the company is working closely with PRSS to jointly develop and

6. INDUSTRY OVERVIEW *(Cont'd)*

patent several products and solutions globally, in the field of atmospheric corrosion control. Imports or foreign sources of atmospheric corrosion control products from USA and Europe are much more expensive. Hence, CSSB has a strong position in the atmospheric corrosion control market in Malaysia.

(Source : Frost & Sullivan Report dated April 2004)

6.7.7 Prospects and outlook of the industry

The market for atmospheric corrosion control products was estimated at around RM120 million in 2002. The market is anticipated to increase dramatically, to reach RM201.2 million in 2008, yielding a compound annual growth rate of 8.9%. There is a trend towards applying corrosion control products when the plant and equipment is first commissioned, instead of applying remedial actions when normal corrosion takes place.

The following factors are expected to drive the growth of the industry:-

(i) Technological advances stimulate exploration and production activities

The hydrocarbon potential of the Baram Delta has long been seen as promising, but the cost of deep-water prospecting repelled most potential investors. The recent discovery could bring about more deep-water exploration and production activities in both Malaysia and Asia as a whole. Deep-water exploration is the final frontier of the petroleum industry, with the maturing of existing petroleum fields. Over the past few years, there have been dramatic changes in technology that greatly reduces the cost of accessing a molecule of petroleum. Both ultra-deep platforms and next generation seismic-imaging techniques allow reservoirs to be visualised on a screen in minutes rather than the months it would have taken a few years ago. The arrival of three dimension seismic imaging in the late eighties and nineties helped transformed the petroleum industry. By assisting to make sense of what is going on inside the rocks underground, this has made the process of finding petroleum much less of a hit-and-miss affair. However, there is still room for further improvement. Another potential technological advance lies in the development of smarter drill bits that encase sensors capable of measuring conditions in the surrounding rocks. They act as the eyes and ears for the driller, by looking far ahead of the drill bit and communicating to the operator in real time. Thanks largely to technological advances, the average finding and development cost of crude oil has fallen to a third of the RM76 a barrel it was two decades ago. Meanwhile, the average extraction cost has fallen by half, to less than RM15 a barrel.

The average recovery rate for an oil field remains at between 30% and 35%. In other words, of all the crude oil proven to exist in a given reservoir, petroleum companies typically get only about a third to the market. The key is not simply to coax more crude oil from the oil-bearing rocks of a reservoir, but also to tap smaller fields nearby that were previously uneconomic, by using tools such as multi-directional wells. As a harbinger of things to come, the use of chemicals pumped down the wells under high pressure could enhance the fracturing of low permeability rocks and thereby increasing the production. In addition, installing compressors at the bottom of the wells could help to stave off the decline in reservoir pressure over a period of time, and so boost petroleum recovery. Hence, the arrival of sequential technological advances in three broad areas should collectively add up to improved recovery rates and lower extraction costs. This includes better visualisation of reservoirs, better placement and drilling and better management once the wells are in production. Needless to say, the longer the reservoirs are producing petroleum, the longer are the platforms and associated facilities are needed, and the more corrosion control measures are needed.

6. INDUSTRY OVERVIEW (Cont'd)**(ii) Expansion of downstream gas activities spurs demand**

Currently, Malaysia is the third largest exporter of liquefied natural gas (LNG), after Indonesia and Algeria. There are three LNG plants in operation in Bintulu, Sarawak. The first LNG plant came on-stream in 1983, the second one in 1996 and the third one in 2003. The natural gas comes from the offshore fields in Sarawak. Collectively, the three plants make the Bintulu LNG complex the world's largest LNG production center with a combined capacity of 23 million metric tons per annum.

Besides the LNG plants, other gas projects include the Peninsula Gas Utilisation project in west Malaysia, gas supply to the western coast of Sabah and the Trans-Thailand-Malaysia Gas Pipeline System. Under the Trans-Thailand-Malaysia Gas Pipeline System, gas will be transported from the Malaysia-Thai Joint Development Area to the Peninsula Gas Utilisation pipeline at Changlun, Kedah. This linkage is expected to make a mark a major step towards realising the trans-ASEAN Gas Grid project. PETRONAS also owns and operates two of the five refineries in Malaysia, producing about a quarter million barrels per day. Due to constant exposure to the weathering agents, these gas facilities also need corrosion control.

(iii) Development of Petrochemical Industry Stimulates Demand

To date, integrated petrochemical complexes have been established in Gebeng (Pahang), Kerteh (Terengganu) and Tanjung Langsat (Johore) in the country. Collectively, there are 25 petrochemical projects located in the three petrochemical complexes. To achieve self-sufficiency in selected petrochemical products, PETRONAS is planning to invest around RM6.9 billion during the period between 2001 and 2005, with both local and foreign partners, on the petrochemical industry. The feedstock to these petrochemical plants comes from the gas deposits extracted by 66 petroleum platforms lying offshore in Trengganu. Being located near to the coastal areas, these petrochemical plants are subjected to constant corrosion, and hence, need corrosion control products.

(iv) Promotion of Shipbuilding Industry Encourages Demand

The government plans to gradually establish a ship building and repair infrastructure, as the country is a major trading nation. The industry has developed naturally on the basis of national requirements and the need for transportation of goods along the coastline. Opportunities are present in the building of ships and boats such as small tankers, cargo vessels, ferries, tugboats and trawlers, the repairing of ships and boats and the fabrication of smaller craft like leisure yachts, pleasure boats and sailboats.

At present, only a handful of ship yards have the capability and capacity to build and repair ocean-going ships, generally in the range of not more than 5,000 dead weight tons. Repairs on a few foreign ships have been undertaken on a jobbing basis. All these activities require substantial amount of corrosion control products in the refurbishing and repairing phases. However, the development of the shipping industry is forecasted to be slow and relatively constant during the duration of the forecast period.

(Source : Frost & Sullivan Report dated April 2004)

[The rest of this page is intentionally left blank]