CHAPTER - III

PRICING & DISTRIBUTION NETWORK OF LUBRICANT INDUSTRY
Distribution & Pricing

Transportation and Distribution of products:

Considering the geographical spread of the country, the infrastructure for movement of petroleum products is woefully inadequate for handling the growing volume of POL products. Not much thought has been given for development of pipelines. Due to non availability of tank – wagons, oil movement is undertaken by road which is not only hazardous and polluting but also 15 to 20 times costlier (in terms of energy consumption as per SRC report) compared to pipelines and 5 times costlier than railways in a country where oil is being imported, expenditure on movement of POL products by road results in serious drain of foreign exchange. The losses due to road/ rail transportation are also 3 to 5 times higher compared to transportation through pipelines.

The current mode of transporting POL products is discussed in the following paragraphs.

Rail

Railways have all along been an important means of transportation for POL products. This has been so as rail movements are comparatively cost effective vis-à-vis road movements. However the limiting factor has been the availability of tank wagons. Notwithstanding this fact, more than 40% of the POL movement are made through railways and in the years to come it will constitute, to contribute as an important made of transport for POL products. The details of estimated tank wagon loading in the last 7 years is as given in table.

Estimated movement through railways:

<table>
<thead>
<tr>
<th>Year</th>
<th>Rail(mmt)</th>
<th>Total(mmt)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989-90</td>
<td>24.6</td>
<td>54.1</td>
<td>45.50%</td>
</tr>
<tr>
<td>1990-91</td>
<td>25.1</td>
<td>55.0</td>
<td>45.60%</td>
</tr>
<tr>
<td>1991-92</td>
<td>26.2</td>
<td>57.0</td>
<td>46.00%</td>
</tr>
<tr>
<td>1992-93</td>
<td>26.5</td>
<td>59.0</td>
<td>44.90%</td>
</tr>
<tr>
<td>1993-94</td>
<td>26.1</td>
<td>60.8</td>
<td>42.90%</td>
</tr>
<tr>
<td>1994-95</td>
<td>28.6</td>
<td>65.4</td>
<td>43.70%</td>
</tr>
<tr>
<td>1995-96</td>
<td>29.3</td>
<td>72.5</td>
<td>40.40%</td>
</tr>
</tbody>
</table>

The share of rail in the total traffic would however fall in the years to come due to withdrawal of budgetary support. To overcome the shortages of tank-wagons, especially for transportation of LPG, oil companies have been financing railways under "own your tanks wagon scheme." Railways offer a rebate in freight with respect to products moved through tank wagons owned
by oil companies. Since the depreciation on tank wagons is compensated under APM, oil companies surrender the rebate so received to OCC.

**Pipelines**

At present, about 80% of the total pipeline capacity is owned by IOC and the balance capacity is held by HPCL. Apart from the Kundla, Bhatinda pipeline, put up by the IIC and yet to be fully commissioned the other pipeline projects under construction are

Mumbai – Manmad pipeline, by BPC covering 270km with an initial capacity of 3.30 mmtpa.

Vizag – Vijayawada pipeline, by HPC covering 380 km with an initial capacity of 4.00 mmtpa expected to be commissioned by mid – 1999.

The Ministry of Petroleum & Natural Gas has acknowledged the importance of creation of a pipeline grid and recently approved the setting up of an apex holding company which will co-promote specific, pipeline JVCs to implement discrete sections of the grid. The holding company will be a non government company in which IOC, BPC and HPC will hold 16% each and IBP will hold 2% The balance 50% will be offered to private sector oil companies and financial institutions. The holding company shall subscribe to 36% of equity in each of the JVCs 48% shall be offered to the public and oil PSUs financial institutions. The holding company shall subscribe to 36% of equity in each of the JVCs 48% shall be offered to the public and oil PSUs financial institutions and private sector oil companies shall subscribe the remaining 26%.

**Ocean & road transportation**

Currently, limited product movements take place between port locations. Oil companies at the directions of OCC have taken on charter hire 27 tankers from shipping companies with an aggregate DWT of 0.638mn. The difference between the cost of transportation as included in the price vis-avis the actual cost is adjusted in the pool a/c. In addition, direct importation of products is also handled at port locations. The total traffic estimated in 1995-96 was 5.50 mmt. The importance of this mode of movement will diminish with the installation up to more refineries in port locations.

The estimated balance traffic, of 22.20 mmt of products, was moved through road in 1995-96 constituting nearly 30% of the total movement. Unless urgent measures are taken to improve the pipeline and rail infrastructure, road will continue to be one of the key modes of transport.

**Storage and distribution infrastructure**

**Installations, depots and tankages**

Installations are lager storage points attached to refineries or to a port and serve as supply sources to small locations in the region. Deports are very small storage & distribution
centers that generally cater to the needs of a city or town. At present oil conpanies have installations in almost all major cities and port locations and depots at all district headquaters. The total tankage capacity of the industry at the middle of 1995 stood at 10.75 mmt, repres-enting a capacity of about 1.72 month’s sale.

The company wise tankages infrastructure

<table>
<thead>
<tr>
<th></th>
<th>OIC</th>
<th>HPCL</th>
<th>BPCL</th>
<th>IBP</th>
<th>Refiners</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPB</td>
<td>0.014</td>
<td>0.010</td>
<td>0.005</td>
<td>0.000</td>
<td>0.024</td>
<td>0.053</td>
</tr>
<tr>
<td>MS</td>
<td>0.402</td>
<td>0.187</td>
<td>0.195</td>
<td>0.015</td>
<td>0.056</td>
<td>0.855</td>
</tr>
<tr>
<td>Naphtha</td>
<td>0.342</td>
<td>0.143</td>
<td>0.174</td>
<td>0.023</td>
<td>0.191</td>
<td>0.873</td>
</tr>
<tr>
<td>ATF</td>
<td>0.350</td>
<td>0.106</td>
<td>0.091</td>
<td>0.004</td>
<td>0.038</td>
<td>0.589</td>
</tr>
<tr>
<td>Sko</td>
<td>0.993</td>
<td>0.259</td>
<td>0.312</td>
<td>0.026</td>
<td>0.119</td>
<td>1.709</td>
</tr>
<tr>
<td>HSD</td>
<td>2.031</td>
<td>0.680</td>
<td>0.842</td>
<td>0.057</td>
<td>0.216</td>
<td>3.826</td>
</tr>
<tr>
<td>LDO</td>
<td>0.197</td>
<td>0.066</td>
<td>0.028</td>
<td>0.000</td>
<td>0.036</td>
<td>0.327</td>
</tr>
<tr>
<td>FO</td>
<td>0.431</td>
<td>0.179</td>
<td>0.072</td>
<td>0.001</td>
<td>0.063</td>
<td>0.746</td>
</tr>
<tr>
<td>LSHS</td>
<td>0.185</td>
<td>0.053</td>
<td>0.048</td>
<td>0.000</td>
<td>0.079</td>
<td>0.365</td>
</tr>
<tr>
<td>Others</td>
<td>0.769</td>
<td>0.202</td>
<td>0.304</td>
<td>0.017</td>
<td>0.115</td>
<td>1.407</td>
</tr>
<tr>
<td>Total</td>
<td>5.714</td>
<td>1.885</td>
<td>2.071</td>
<td>0.143</td>
<td>0.937</td>
<td>10.750</td>
</tr>
</tbody>
</table>

Port facilities

Currently facilities for import ofPOL products including crude is available in varying degrees in all the 12 port locations at Kandla, Okha, Mumbai, JNPT (Mumbai), Vaco, Mangalore, Cochin, Tuticorin, Chennai, Vizag, haldia, Paradeep and Budge Budge. The port facilities however suffer from serious constraints and considerable expenditure on demurrage is paid to coastal and foreign flag vessels.

LPG Bottling plants

LPG, in packed form is currently being marketed in 14.2 kg, 19 kg and 50 kg cylinders however, special facilities are needed to pack the LPG in vottles. LPG bottling plants are setup near the markets to facilitate return movement of empty cylinders. Among the PSUs IOC, HPCL and BPCL are marketing packed LPG.

Product échange

One of the main objectives of APM is to optimize the utilization of refining and marketing infrastructure by treating the facilities of all the oil companies through hospital-
ity arrangements and thus eliminate wasteful duplication of investment. The facilities of oil companies have been developed over a period of time and oil companies have been operating at several locations without owning the infrastructure and using facilities of other companies on a reciprocative basis. In several places, the oil companies do not even have office space and the company that owns the facility prepares the invoice. In the event of decontrol, a lot of complications may arise on this account and till such time the facilities are put up by other companies, it may result in cross- haulage of products with its attendant ramifications. Further, it could result in duplication of facilities for bottling, tankages for storing, distribution infrastructure like loading gantries. Which may not be optimally utilizes. This could be one of the serious hurdles that need to be addressed before the industry is fully decontrolled. The subject has been dealt in detail in the chapter on De-regulation.

**Regional supply/demand**

The region wise consumption of petroleum products is given in table

<table>
<thead>
<tr>
<th>Product</th>
<th>Sales in tmt 1995 – 96</th>
<th>Total</th>
<th>Percentage share</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>North</td>
<td>East</td>
<td>Weast</td>
</tr>
<tr>
<td>LPG</td>
<td>1273</td>
<td>448</td>
<td>1180</td>
</tr>
<tr>
<td>MS</td>
<td>1617</td>
<td>516</td>
<td>1368</td>
</tr>
<tr>
<td>HSD</td>
<td>10553</td>
<td>4538</td>
<td>8363</td>
</tr>
<tr>
<td>NAPHE</td>
<td>1121</td>
<td>311</td>
<td>1816</td>
</tr>
<tr>
<td>SKO</td>
<td>2362</td>
<td>1972</td>
<td>2869</td>
</tr>
<tr>
<td>LDO</td>
<td>315</td>
<td>307</td>
<td>568</td>
</tr>
<tr>
<td>FO/LSHS</td>
<td>2181</td>
<td>1204</td>
<td>4909</td>
</tr>
<tr>
<td>BTUMEN</td>
<td>579</td>
<td>326</td>
<td>682</td>
</tr>
<tr>
<td>LUBES</td>
<td>165</td>
<td>150</td>
<td>239</td>
</tr>
<tr>
<td>Total</td>
<td>20166</td>
<td>9772</td>
<td>21994</td>
</tr>
</tbody>
</table>

As per studies conducted by OCC the consumption of petroleum products is likely to reach a level of 113mt by the year 2001-02. Moreover with the commissioning of planned refineries, excepting for northern and eastern India, product availability would be in surplus. There would however be a huge deficit in the northern region this could be partially met by refineries in the western region using the Kandla, Bhatinda pipeline. The refineries currently being set up in the western and northeastern part of the country carry a risk of operating in the region where products are in surplus, thus they would have to compete directly with the exist-
ing players in the sector. Disposal of the product itself could be a serious problem in the northeast with no choice but to export the surplus.

**Marketing network**

The marketing network of oil companies consist of retail outlets through which MS & HSD are sold through distribition of LPG to distributed set of customers attached to each company and SKO & LDO dealerships for distributing SKO/LDO.

Strong growth has been witnessed in the retail segment and this segment is likely to grow at double digit rates. Due to the slowdown in industrial activity in 1996-97 there has been a sharp decline in the consumption of bulk products with the annual growth rate falling to less than 4% in 1996-97 pushing down the overall growth rate.

The focus of the oil companies has now shifted to the retail customer with more and more value added services being provided at retail outlets, especially with little maneuverability on prices. The pump outlets are being modernized with refreshing signage, thus the thrust is on creating strong brands. BPCL has been a leader in this segment and this has yielded them rich dividends as their growth rates in the retail segment has been the highest in the last 4-5 years.

In order to contain the deficit arising in marketing of products like SKO & LPG, the government introduced the parallel marketing scheme LPG & SKO were decanalized, their import duties were brought down and the private sector marketers were allowed to market these products at market related prices. However due to huge price disparity in the products marketed by these players vis-à-vis the price at which the products are sold by PSUs besides volatility in price of imported products, the scheme has not taken off and may entrants into the sector have left the scene. The success of the scheme would critically depend on the time frame in which uniform pricing is introduced.

The marketing oil companies are in an enviable position of having an established marketing network, a vastly depreciated storage & distribution network and it would not only be cost prohibitive but also extremely difficult to replicate the facilities in place. This could be a key barrier for new entrants into the business. The sales volumes are also likely to grow at a CAGR of more than 7% and the sales volumes of the oil companies would double in the next decade. The key drivers to profits would be retail products like MS, HSD and LPG and companies focused on retail markets are also likely to gain strength, It may however be noted that competition among of these companies.

**Retail pump outlets**

As per the existing govt. policy, petrol pumps can be set up by the four public sector oil companies and more recently private players like Reliance and Essar are in the fray. Despite frequent visits very few people know about them
Product marketed at retail outlet

Motor spirit

Petrol in technical language is called motor spirit. It is mainly used in passenger vehicles such as scooters and cars. At present, two types of petrol are being sold namely low lead petrol and unleaded petrol (ULP). Cars are using ULP which have catalytic Converters and its availability is common in most cities in India.

High speed diesel

This is used mainly in heavy commercial vehicles. At present, diesel is sold on metro cities and has maximum sulphur content of 0.5% whereas in other places maximum sulphur content allowed is 1.0% it is proposed that w.e.f. 1.4.99 that it will be further reduced to 0.25% throughout the country.

Lubricants

This is a vital product for the life of an engine. A lubricant is a viscous product used in the engine for its smooth functioning. Petrol pumps supply unadulterated lubricants, as they receive direct supplies from the concerned oil company. Different grades of lubricants are needed for the engine gearbox and other machine parts.

Compressed natural gas

Compressed natural gas is available at selected retail outlets in metropolitan cities. This is an eco friendly fuel and can be used in both petrol and diesel driven vehicles, which are fitted with a special kit meant for the purpose. The vehicles need no mechanical change for its use its availability is being gradually increased through more retail outlets.

Facilities provided at retail outlets

It is the customer’s right to know the facilities that should be provided at the retail outlet. A retail outlet is not just a place for taking the petrol or diesel, it offers a range of services that can be classified as

Mandatory facilities

These are facilities which every which every petrol pump must provide. These include free air, free drinking water. Etc.

General Facilities

This category of facilities is not mandatory. However, for the convenience of the customer, dealers in the vicinity of most of the retail outlets generally provide these. These includes water – coolers, tube wells, snack bars dhabas, rest rooms, bathing & washing space for truckers, telephone STD/PCO servicing/ repair shop, tyre shop etc.
Quality

The term quality implies that the products that you are buying must meet the prescribed specification and be free from any contamination or adulteration. The oil companies strive to ensure quality by carrying out specific checks for different products as listed below.

Checks for petrol

a) Filter paper test
1. Clean the mouth of the nozzle to remove the stains
2. Put a drop of petrol on the filter paper on the nozzle
3. It should evaporate in about two minutes without leaving a stain on the filter paper (if the area of the filter paper where the drop on MS was put remains pinkish it is the color or MS not any stain)
a. If any stain is left on the filter paper then there is a possibility of adulteration
b) Check for petrol and diesel

Density check

A 500 ml jar, a hydrometer and ASTM (American Society of Testing Material) conversion charts are required to carry out this test. A hydrometer is a very simple instrument for measuring density of any liquid. Which should be different for petrol and diesel.

a) Fill about ¾" of the jar with the product taken through the nozzle of the Dispensing Unit.
b) Dip the thermometer and the hydrometer in the jar and record the temperature and the density as indicated.
c) The actual density observed is then converted into density at 15 degree centigrade is mentioned in each delivery challan issued by the supplying depot for ever load sent to the retail outlet) This converted density is then compared with the density shown by the records maintained at the retail outlet on the basis of density recorded on the delivery challans. If the difference is more than 0.003 it indicates the possibility of adulteration.

b. Checks for detecting adulteration of Ms/ HDS with kerosene

a. Furfural Test

These tests are carried out both by the dealer and oil company officials during their periodical inspections.

b. Water contamination checks – All products.

Oil company officials carry out these tests during their periodical inspections.

c. In case of lubricants

The customers are required to check the seal of the container of manufacture and name of manufacture for the convenience of 2/3 wheeler driver generally retail outlets pro-
vide 2-T dispensers and also keep tamperproof 2-T pouches.

Quality

To ensure that you will get the right quality all the retail outlets are mandatorily required to keep a calibrated five liter measure which is required to be stamped by weights & measures department every year. The customers can check quantity whenever they have doubt about the quality delivered.

Correct price

The consumers can always check the selling price of the products, which the dealers are required to display prominently at the outlet. Consumers must ensure that they take a cash memo for every purchase. This will help the company to take appropriate action against the erring dealer whenever required. The consumer must check the meter reading zero before start of delivery.

Safety Measures

Petroleum products are highly inflammable and therefore dangerous products. The handling is strictly governed by Explosive rules. Petrol pump is a licensed property and all the activities carried out in it are subject to explosive rules for the safety of all concerned. The following precautions are observe:

The consumer is asked to switch off the vehicle before taking delivery of the fuel.

Consumers are not allowed to smoke in the Petrol Pump premises.

Malpractices

Oil companies take adequate preventive measures to ensure that the customers get the correct quality/quantity at the right price. For this officers at various levels carry out periodic random and surprise inspections. The prescribed frequency of inspection is as thus Field officers to inspect all retail outlets in their area once in a quarter.

Seniors officers in Divisional/ Zonal Offices are required to inspect all retail outlets under their jurisdiction once in a year. In addition, 10% of the retail outlets are to be covered for random inspection by senior officers.

Besides, Mobile labs are operation on industry basis in each state for on the spot lab test for product stored and sold by the dealers.

In addition to this inspection teams of oil industry also carry out periodic surprise inspections of all outlets. However like in any other business, the existence of some unscrupulous dealers in petroleum trade cannot be ruled out. The possible malpractices indulged in are.

Adulteration: Mixing cheaper homogenous products in petrol or diesel are the most common type of adulteration. For example petrol and diesel can be adulterated with kerosene, as the
price of kerosene distributed throughout the PDS is kept low due to social considerations. Other cheaper petroleum products/petrochemicals can also be used as adulterants. Adulteration of products will definitely tell on the performance of the vehicles.

**Short Deliver**: although dispensing units (Machine delivering petrol/diesel) are annually calibrated and sealed by the weights and measure department and periodically checked by the company, the possibility of tapering with the machines or malfunctioning is not ruled out.

**Display/Price**: The dealer is not allowed to sell or purchase unauthorized products, nor is he allowed to overcharge. Each retail outlet is therefore, required to display the stock as well as the price of the products.

**Marketing discipline guidelines**

In order to provide the customer the right quality and quantity of the product to make the dealer aware of good and safe practices of handling petroleum products and to have a uniform code of conduct and discipline, guidelines have formulated and codified uniformly by the oil industry under the guidance of the Ministry of Petroleum and Natural gas. MDG covers subjects such as safe handling practices for petroleum products, maintenance of equipments, preventive measures to check and control irregularities and spell out punitive action against erring dealers. Some of the important relevant provisions of MDG are.

**Quantity/Quality control Measures**

Dealers to keep filter papers to check quality of petrol

Filter paper to be made available to customer on demand for checking adulteration

Dealer to keep density record and density checking kit

Dealer to display posters indicating the method of detecting adulteration and detailing procedure for redressal of grievances and name telephone number / of the company’s office and officer.

Dealer to keep duly calibrated five-liter measure.

Dealer to check delivery of dispensing units everyday

**Statutory Requirements**

The dealer is required to comply with all the statutory requirements & other regulations like explosives Rules Ms/HDS control order, instructions issued.
Oil Price History and Analysis

Introduction

Crude oil prices behave much as any other commodity with wide price swings in times of shortage or oversupply. The crude oil price cycle may extend over several years responding to changes in demand as well as OPEC and non-OPEC supply.

The U.S. petroleum industry’s price has been heavily regulated through production or price controls throughout much of the twentieth century. In the post World War II era U.S. oil prices at the wellhead have averaged $20.94 per barrel adjusted for inflation to 2004 dollars. In the absence of price controls the U.S. price would have tracked the world price averaging $22.86. Over the same post war period the median for the domestic and the adjusted world price of crude oil was $17.18 in 2004 prices. That means that only fifty percent of the time from 1947 to 2004 have oil prices exceeded $17.18 per barrel. (See note in box on right.)

Until the March 28, 2000 adoption of the $22–$28 price band for the OPEC basket of crude, oil prices only exceeded $23.00 per barrel in response to war or conflict in the Middle East.

The Very Long Term View

The very long term view is much the same. Since 1869 US crude oil prices adjusted for inflation have averaged $18.59 per barrel compared to $19.41 for world oil prices.

Fifty percent of the time prices were U.S. and world prices were below the median oil price of $15.17 per barrel.

If long term history is a guide, those in the upstream segment of the crude oil industry should structure their business to be able to operate with a profit, below $15.17 per barrel half of the time.

Post World War II

Pre Embargo Period

Crude Oil prices ranged between $2.50 and $3.00 from 1948 through the end of the 1960s. The price oil rose from $2.50 in 1948 to about $3.00 in 1957. When viewed in 2004 dollars an entirely different story emerges with crude oil prices fluctuating between $15 - $17 during the same period. The apparent 20% price increase was just keeping up with inflation.

From 1958 to 1970 prices were stable at about $3.00 per barrel, but in real terms the price of
crude oil declined from above $16 to below $13 per barrel. The decline in the price of crude when adjusted for inflation was amplified for the international producer in 1971 and 1972 by the weakness of the US dollar.

OPEC was formed in 1960 with five founding members Iran, Iraq, Kuwait, Saudi Arabia and Venezuela. By the end of 1971 six other nations had joined the group: Qatar, Indonesia, Libya, United Arab Emirates, Algeria and Nigeria. From the foundation of the Organization of Petroleum Exporting Countries through 1972 member countries experienced steady decline in the purchasing power of a barrel of oil.

Throughout the post war period exporting countries found increasing demand for their crude oil but a 40% decline in the purchasing power of a barrel of crude. In March 1971, the balance of power shifted. That month the Texas Railroad Commission set proration at 100 percent for the first time. This meant that Texas producers were no longer limited in the amount of oil that they could produce. More importantly, it meant that the power to control crude oil prices shifted from the United States (Texas, Oklahoma and Louisiana) to OPEC. A little over two years later OPEC would through the unintended consequence of war get a glimpse at the extent of its ability to influence prices.
Middle East Supply Interruptions

Yom Kippur War - Arab Oil Embargo

In 1972 the price of crude oil was about $3.00 per barrel and by the end of 1974 the price of oil had quadrupled to over $12.00. The Yom Kippur War started with an attack on Israel by Syria and Egypt on October 5, 1973. The United States and many countries in the western world showed strong support for Israel. As a result of this support several Arab exporting nations imposed an embargo on the countries supporting Israel. Arab nations curtailed production by 5 million barrels per day (MMBPD) about 1 MMBPD was made up by increased production in other countries. The net loss of 4 MMBPD extended through March of 1974 and represented 7 percent of the free world production.

If there was any doubt that the ability to control crude oil prices had passed from the United States to OPEC it was removed during the Arab Oil Embargo. The extreme sensitivity of prices to supply shortages became all too apparent when
prices increased 400 percent in six short months.

From 1974 to 1978 world crude oil prices were relatively flat ranging from $12.21 per barrel to $13.55 per barrel. When adjusted for inflation the price over that period of time exhibited a moderate decline.

**Crises in Iran and Iraq**

Events in Iran and Iraq led to another round of crude oil price increases in 1979 and 1980. The Iranian revolution resulted in the loss of 2 to 2.5 million barrels of oil per day between November, 1978 and June, 1979. At one point production almost halted.

Iraq invaded Iran in September, 1980 by November the combined production of both countries was only a million barrels per day and 6.5 million barrels per day less than a year before. Worldwide crude oil production was 10 percent lower than in 1979.

The combination of the Iranian revolution and the Iraq/Iran War resulted in crude oil prices more than doubling from $14 in 1978 to $35 per barrel in 1981. Twenty-five years later Iran’s production is only two-thirds of the level reached under the government of Reza Pahlavi the former Shah of Iran.

**US Oil Price Controls - Bad Policy?**

The rapid increase in crude prices from 1973 to 1981 would have been much less were it not for United States energy policy during the post Embargo period. The US imposed price controls on domestically produced oil in an attempt to lessen the impact of the 1973-74 price increase. The obvious result of the price controls was that U.S. consumers of crude oil paid about 50 percent more for imports than domestic production. Put another way U.S producers received less than world market price.

Did the policy achieve its goal? In the short term the recession induced by the 1973-1974 crude oil price rise was less because U.S. consumers faced lower prices. However, it had other effects as well. In the absence of price controls U.S. exploration and production would certainly have been significantly greater. The
higher prices faced by consumers would have resulted in lower rates of consumption: automobiles would have had higher mileage sooner, homes and commercial buildings would have been better insulated and improvements in industrial energy efficiency would have been greater than they were during this period. As a consequence, the United States would have been less dependent on imports in 1979-1980 and the price increase in response to Iranian and Iraqi supply interruptions would have been significantly less.

OPEC's Failure to Control Crude Oil Prices

OPEC has seldom been effective at controlling prices. While often referred to as one OPEC does not satisfy the definition of a cartel. One of the primary requirements is a mechanism to enforce member quotas. During the 1979-1980 period of rapidly increasing prices, Saudi Arabia's oil minister Ahmed Yamani repeatedly warned other members of OPEC that high prices would lead to a reduction in demand. His warnings fell on deaf ears.

Surging prices caused several reactions among consumers: better insulation in new homes, increased insulation in many older homes, more energy efficiency in industrial processes, and automobiles with higher mileage. These factors along with a global recession caused a reduction in demand which led to falling crude prices. Unfortunately for OPEC only the global recession was temporary. Nobody rushed to remove insulation from their homes or to replace energy efficient plants and equipment — much of the reaction to the oil price increase of the end of the decade was permanent and would not respond to lower prices with increased demand for oil.

The higher prices also resulted in increased exploration and production outside of OPEC. From 1980 to 1986 non-OPEC production increased 10 million barrels per day. OPEC was faced with lower demand and higher supply from outside the organization.

From 1982 to 1985 OPEC attempted to set production quotas low enough to stabilize prices. These attempts met with repeated failure as various members of OPEC would produce beyond their quotas. During most of this period Saudi Arabia acted as the swing producer cutting its production to stem the free falling prices. In August of 1985, the Saudis tired of this role. They linked their oil prices to the spot market for crude and by early 1986 increased production from 2 MMBPD to 5 MMBPD. Crude oil prices plummeted below $10 per barrel by mid-1986.

A December 1986 OPEC price accord set to target $18 per barrel was already breaking down
by January of 1987. Prices remained weak. The price of crude oil spiked in 1990 with the uncertainty associated Iraqi invasion of Kuwait and the ensuing Gulf War, but following the war crude oil prices entered a steady decline until in 1994 inflation adjusted prices attained their lowest level since 1973.

OPEC had mixed success at controlling prices. There were mistakes in timing of quota changes as well as the usual problems in maintaining production discipline among its member countries. The price cycle then turned up. The United States economy was strong and the Asian Pacific region was booming. From 1990 to 1997 world oil consumption increased 6.2 million barrels per day. Asian consumption accounted for all but 300,000 barrels per day of that gain and contributed to a price recovery that extended into 1997.

The price increases came to a rapid end when the impact of the economic crisis in Asia was either ignored or severely underestimated by OPEC. In December, 1997 OPEC increased its quota by 2.5 million barrels per day (10 percent) to 27.5 MMBPD effective January 1, 1998. The rapid growth in Asian economies had come to a halt and in 1998 Asian Pacific oil consumption declined for the first time since 1982. The combination of lower consumption and higher OPEC production sent prices into a downward spiral. In response, OPEC cut quotas by 1.25 million b/d in April and 1.335 million in July. Price continued down through December 1998. Prices began to recover in early 1999 and OPEC reduced prices another 1.719 million barrels in April 1999. As usual not all of the quotas were observed but between early 1999 and the middle of 1999 OPEC production dropped by about 3 million barrels per day, but was sufficient to move prices above $25 per barrel.

With minimal Y2K problems and growing US and world economies the price continued to rise throughout 2000 to a post 1981 high. Between April and October three successive quota increases totaling 3.2 million barrels per day were not able to stem the price increases. Prices finally started down following another quota increase of 500,000 effective November 1, 2000. Russian production increases dominated non-OPEC production growth from 2000 forward and was responsible for most of the non-OPEC increases since the turn of the century.

Once again it appeared that OPEC overshot the mark. In 2001 a weakening US economy and increases in non-OPEC production put downward pressure on prices. In response OPEC once again entered into a series of reductions in member quotas cutting 3.5 million barrels by September 1, 2001. In the absence of the September 11, 2001 terrorist attack this would have been sufficient to moderate or even reverse the trend. In the wake of the attack the crude oil price plummeted. Spot prices for the U.S. benchmark West Texas Intermediate were down 35 percent by the middle of November. Under normal circumstances a drop in price of this magnitude would have resulted an another round of quota reductions but given the political climate OPEC delayed additional cuts until January 2002 when it reduced its quota by 1.5
million barrels per day and was joined by several non-OPEC producers including Russia who promised combined production cuts of an additional 462,500 barrels. This had the desired effect with oil prices moving into the $25 range by March, 2002. By mid-year the non-OPEC members were restoring their production cuts but prices continue to rise and U.S. inventories reached a 20-year low later in the year.

By yearend oversupply was not a problem. Problems in Venezuela led to a strike at PDVSA causing Venezuelan production to plummet. In the wake of the strike Venezuela was never able to restore capacity to its previous level and is still about 900,000 barrels per day below its peak capacity of 3.5 million barrels per day. OPEC increased quotas by 2.8 million barrels per day in January and February, 2003.

On March 19, 2003, just as some Venezuelan production was beginning to return, military action commenced in Iraq. Meanwhile, inventories remained low in the U.S. and other OECD countries. With an improving economy U.S. demand was increasing and Asian demand for crude oil was growing at a rapid pace. The loss of production capacity in Iraq and Venezuela combined with increased production to meet growing international demand led to the erosion of excess oil production capacity. In mid 2002, there was over 6 million barrels per day of excess production capacity, but by mid 2003 the excess was below 2 million. During much of 2004 and 2005 the spare capacity to produce oil has been under one million barrels per day. A million barrels per day is not enough spare capacity to cover an interruption of supply from almost any OPEC producer. In a world that consumes over 80 million barrels per day of petroleum products that adds a significant risk premium to crude oil price and is largely responsible for prices in excess of $40 per barrel. The graphs and text below have not been updated.

Impact of Prices on Industry Segments

Drilling and Exploration

Boom and Bust

The Rotary Rig Count is the average number of drilling rigs actively exploring for oil and gas. Drilling an oil or gas well is a capital investment in the expectation of returns from the production of crude oil or natural gas. Rig count is one of the primary measures of the health of the exploration segment of the oil and gas industry. In a very real sense it is a measure of the oil and gas industry's confidence in its own future.

At the end of the Arab Oil Embargo in 1974 rig count was below 1500. It rose steadily with regulated crude oil prices to over 2000 in 1979. From 1978 to the beginning of 1981 domestic crude oil prices exploded from a combination of the rapid growth in world energy prices and deregulation of domestic prices. Forecasts of crude oil prices in excess of $100 per barrel fueled a drilling frenzy. By 1982 the number of rotary rigs running had more than doubled.
It is important to note that the peak in drilling occurred over a year after oil prices had entered a steep decline which continued until the 1986 price collapse. The one year lag between crude prices and rig count disappeared in the 1986 price collapse. For the next few years the towns in the oil patch were characterized by bankruptcy, bank failures and high unemployment.

**After the Collapse**

Several trends established were established in the wake of the collapse in crude prices. The lag of over a year for drilling to respond to crude prices is now reduced to a matter of months. (Note that the graph on the right is limited to rigs involved in exploration for crude oil as compared to the previous graph which also included rigs involved in gas exploration.) Like any other industry that goes through hard times the oil business emerged smarter and much leaner. Industry participants, bankers and investors were far more aware of the risk of price movements. Companies long familiar with accessing geologic risk added price risk to their decision criteria.

Technological improvements were incorporated:

- Increased use of 3-D seismic data reduced drilling risk.
- Directional and horizontal drilling led to improved production in many reservoirs.
- Financial instruments were used to limit exposure to price movements.
- Increased use of CO₂ floods to improve production in existing wells.

In spite of all of these efforts the percentage of rigs employed in drilling for crude oil decreased from over 60 percent of total rigs at the beginning of 1988 to under 40 percent currently.

**Well Completions - A measure of success?**

Rig count does not tell the whole story of oil and gas exploration and development. It is certainly a good measure of activity, but it is not a measure of success.

After a well is drilled it is either classified as an oil well, natural gas well or dry hole. The percentage of wells completed as oil or gas wells is frequently used as a measure of success. In fact, this percentage is often referred to as the success rate.

Immediately after World War II 65 percent of the wells drilled were completed as oil or gas wells. This percentage declined to about 57 percent by the end of the 1960s. It rose steadily during the 1970s to reach 70 percent at the end of the decade. This was followed by a plateau or modest decline through most of the 1980s.

Beginning in 1990 shortly after the harsh lessons of the price collapse completion rates in-
creased dramatically to 77 percent. What was the reason for the dramatic increase? For that matter, what was the cause of the steady drop in the 1950s and 1960s or the reversal in the 1970s?

Since the percentage completion rates are much lower for the more risky exploratory wells, a shift in emphasis away from development would result in lower overall completion rates. This, however, was not the case. An examination of completion rates for development and exploratory wells shows the same general pattern. The decline was price related as we will explain later.

Some would argue that the periods of decline were a result of the fact that every year there is less oil to find. If the industry does not develop better technology and expertise every year, oil and gas completion rates should decline. However, this does not explain the periods of increase.

The increases of the seventies were more related to price than technology. When a well is drilled, the fact that oil or gas is found does not mean that the well will be completed as a producing well. The determining factor is economics. If the well can produce enough oil or gas to cover the cost of completion and the ongoing production costs it will be put into production. Otherwise, its a dry hole even if crude oil or natural gas is found. The conclusion is that if real prices are increasing we can expect a higher percentage of successful wells. Conversely if prices are declining the opposite is true.

The increases of the 1990s, however, cannot be explained by higher prices. These increases are clearly the result of improved technology. The increased use of and improvements to 3-D seismic data and analysis combined with horizontal and directional drilling. Most dramatic is the improvement in the the percentage exploratory wells completed. In the 1990s completion rates have soared from 25 to 45 percent. Workover rig count is a measure of the industry's investment in the maintenance of oil and gas wells. The Baker-Hughes workover rig count includes rigs involved in pulling production tubing from a well that is 1,500 feet or more in depth. Workover rig count is another measure of the health of the oil and gas industry. Most workovers are associated with oil wells. Workover rigs are used to pull tubing for repair or replacement of rods, pumps and tubular goods which are subject to wear and corrosion.

A low level of workover activity is particularly worrisome because it is indicative of deferred maintenance. The situation is similar to the aging apartment building that no longer justifies major renovations and is milked as long as it produces a positive cash flow. When operators are in a weak cash position workovers are delayed as long as possible. Workover activity impacts manufacturers of tubing, rods and pumps. Service companies coating pipe and other tubular goods are heavily affected.
Administered Pricing Mechanism

Evolution of APM

Up to 1939, there were no controls whatsoever on the pricing of petroleum products. Between 1939 and 1948, the oil companies themselves maintained pool accounts for major products without any intervention by the government. In 1948, an attempt was made to regulate prices through Valued Stock account procedure. Under this procedure realization of oil companies was restricted to the import parity price of finished goods (with Ras Tanura as the basing point), plus excise duties/local taxes/dealer margins and agreed marketing margins of each of the refineries. Any excess realization was surrendered to the Government. The Shantilal Shah committee, set up in 1969, did not favor the import parity price being set as a benchmark for domestic pricing as domestic refining capacity had significantly increased by then. In 1976, the Oil Pricing Committee (OPC) recommended the discontinuance of the import parity principle on the following grounds:

- About 90% of the total demand of POL products were met by indigenous production and no major shortfall was anticipated.
- Prices of finished products and crude oil did not necessarily move in tandem.
- Import parity did not take into account inter refinery differences in terms of product pattern, type of crude used, location and scale differences.
- The structure of West Asian product prices, which was the basis of determining prices in India, did not necessarily reflect the cost pattern and operations of Indian refineries.
- The OPC therefore suggested that the domestic cost of production should be the determining factor for pricing of petroleum products. The present day APM was evolved on the recommendation of the OPC and came into existence on December 16, 1977. The smooth implementation of APM was possible, as by then, all the foreign oil companies were acquired by the Government of India.

Rationale for APM

One of the important drawbacks of the import parity pricing was that the indigenous cost of production was totally overlooked while determining producer prices. This issue was addressed through Retention Pricing Mechanism, by which refiners were allowed to “retain” out of the sale proceeds,

- Cost of crude
- Refining cost and
- Reasonable return on investment.

The same mechanism was extended to marketing & distribution companies as well. The Government of India also fixed the pricing of finished products and the returns of oil compa-
nies were de-linked from the price at which the goods were finally sold. With the administration of pricing of products by the government, the retention mechanism also came to be known as the Administered Pricing Mechanism or APM.

The scheme is administered under the aegis of the Ministry of Petroleum & Natural Gas through its executive wing “Oil Co-ordination Committee” (OCC) with its secretariat at New Delhi.

**Objectives of APM**

- To optimize the utilization of refining and marketing infrastructure by treating the facilities of all the oil companies as common industry infrastructure, the access of which would be available to all the oil companies by hospitality arrangements, thus eliminating wasteful duplication of investment.

- To make available all products at uniform price ex-all refineries so as to minimize cross-haulage of products & associated energy costs.

- To ensure continuous availability of products/crude to refiners by recognizing import needs wherever there are deficits in indigenous production.

- To ensure that the returns to oil companies are reasonable, in line with operational efficiencies as also generation of sufficient resources to enable industry to setup facilities to meet the growing needs.

- To ensure stable prices by insulating domestic market from the volatility of prices in the international market.

- To achieve socio-economic objectives of the Government by ensuring availability of certain products at subsidized rates for weaker sections of the society and priority sectors in the industry through cross-subsidization of products.

**Functioning of APM**

**Basic principles**

The basic principles on which the edifice of APM has been built could be summarized as under.

Raw materials are made available at a pre-determined fixed price at the manufacturing point (Delivered Cost of Crude) on a sustained & continuous basis to refiners. Similarly, finished products are made available to marketing companies at pre-determined prices (Ex-refinery prices).

Refining/conversion/marketing costs are reimbursed as per certain pre-determined criteria.

Compensation for investments in fixed assets and working capital is given as per laid down
norms.

Rewards and Penalties are built into the system to encourage efficiency.

**Classification of products under APM**

Currently, the products marketed by oil companies in India are categorized as follows:

- **Formula products** - governed by APM.
- **Free trade products** - outside the purview of APM.

**Retention price**

The oil companies are reimbursed in addition to the cost of crude oil:

- Operating costs
- Return on capital employed
- Operating costs

OCC undertakes a cost updation study of each of the oil companies, once every three years. This three-year period is called the Pricing Period. The last Pricing period expired on March 31, 1996, and the current pricing period has commenced on April 1, 1996. The first year in the pricing period is called the base year. The exercise is normally undertaken in the middle of the pricing period and completed at the end of the pricing period. The costs incurred during the said period, including projections for the pricing cycle, is collated for each of the oil companies, and ad-hoc margins are worked out first and thereafter replaced by final margins. It may be noted that not all costs are reimbursed, and the expert committee of OCC moderates the actual costs. The margins for the pricing period is worked out by prorating the aggregate costs over the standard throughput/sales volumes as per sales plan entitlement (SPE) to arrive at operating cost per unit. The operating cost so arrived will be static during the pricing period excepting for the following escalations which are considered for reimbursement on the merits of each case:

- Increases in salaries/wages arising on account of Long-Term Settlements (LTS).
- Increase in direct variable costs viz. chemicals, catalysts and utilities (purchased power & water) over the cost considered in the base year.
- Increases in rentals payable to railways/statutory Bodies over the cost considered in the base year.
- Increases in CISF expenses over the cost considered in the base year.

It may be noted that in practice, the actual costs recovered by oil companies may not match with the estimated costs considered in the cost updation because of the following reasons:

- the actual costs are dynamic & not static over the pricing period
- not all expenses are fully reimbursed by OCC (*)
- the actual performance may be different from the standards
the actual costs may not be in line with the norms

Obviously, such unavoidable variations in cost actually incurred and the cost recovered/ reimbursed would have a direct bearing on the Profit & Loss account of the oil companies (Refer discussion on Incentives & Penalties)

(*) The following expenses are not reimbursed under APM

- Bonus / ex-gratia in excess of the statutory limit
- Donations & charities
- Bad debts/ provision for doubtful debts
- Loss / gain on disposal of assets

The major heads of expenditure of refiners and marketing companies are

- Chemicals & catalysts
- Consumables, power & utilities
- Repairs & maintenance
- Depreciation
- Salaries & wages
- Product losses
- Overheads

Depreciation is worked out at the rates prescribed by the Companies Act, 1956 on straight-line basis for assets commissioned after April 1, 1983 and on WDV basis for assets commissioned prior to April 1, 1983. Depreciation is computed on pro-rata basis for assets commissioned during the year. However, while working out the margins large capitalization involving substantial changes in product pattern, standard throughput etc are considered only as and when these projects are commissioned.

It may also be noted that bonus/ ex-gratia paid to employees is not considered as a part of cost but as a part of the return and reimbursed along with return on capital employed at a ceiling of 8.33% of the annual wages.

Other aspects of APM

Importation and exportation

At present, based on the demand supply position and the macro economic needs, the Government of India permits import/ export of APM Products. Normally, HSD, SKO, LPG & FO are in shortage and naphtha is in excess. In the year 1995-96, as per MOP & NG estimates, the total imports were Rs125bn while exports were Rs16bn.

Wherever the Government of India decides that the shortage be bridged by imports, oil companies import these products through IOC. The difference between the landed cost of imports and ex-refinery price shall be adjusted in the Pool a/c.
Similarly in the case of exports, the net realisation as reduced by the marketing margin of the respective oil company & the ex-refinery price of the product, is adjusted in the Pool a/c. At present, these exports are routed through IOC and 50% of the marketing margin is retained by IOC.

**Miscellaneous income**

A major portion of miscellaneous income earned by oil companies consists of income from investment of surplus funds, interest on loans given to employees, fee received from other oil companies for providing hospitality, license fee recovery, and sale of scrap.

Since investments in money market instruments is not treated as a part of capital employed, it is but logical that income earned thereon is not reckoned under the APM. All other income related to operations covered under the APM, are either adjusted while computing the retention price, or separately surrendered to Pool account.

Surcharges recovered through Price & Cross-Subsidization of Products

**Surcharges**

As we have seen above, in addition to claims/ surrenders that are self-balancing, oil companies are entitled to several other claims like crude oil price differential, imported product price differential, differential freight etc. The oil pool has to generate funds to meet these claims and the same is done through levy of surcharges as detailed below.

1. Cost & Freight surcharge (C＆F sch)
2. Freight surcharge pool surcharge (FSP sch)
3. Retail pump outlet surcharge (RPO sch)
4. State surcharge (ST sch)
5. Cost variations through rail/ road bridging for out-of-zone movements with specific authorised.

**C＆F surcharge**

An amount of Rs640/ mt/ kl is recovered as C＆F surcharge in the price of all formula products. In the case of free trade products marketed by the oil companies the same shall be included in the transfer price of the product or in the transfer price of feed/ fuel, as the case may be.

**FSP surcharge**

An amount of Rs40/ mt/ kl is recovered as FSP surcharge in the price of all formula products to cover various freight / transportation claims of oil companies.

**RPO surcharge**
An RPO surcharge of Rs60/ kl of MS and Rs20/ kl of HSD is recovered through price to cover the differential commission to be paid to dealers/distributors.

State surcharges

A phenomenon, which developed in the late 80's, was levy of non-recoverable sales & turnover taxes by states. To recover these taxes, a surcharge is recovered on various products and this surcharge varies from state to state and also within a state from product to product. The surcharges are worked out in such a manner that the under-recoveries of all the oil companies in a state are fully recompensed.

It may be noted that the key reason for recovery of surcharges and allowing claims against the same is to enable uniformity & stability of prices.

Product price adjustment

In addition to these surcharges, the Government of India tries to achieve its objective of ensuring availability of certain products at subsidized rates for weaker sections of the society and priority sectors in the industry through cross-subsidization of products. The cross subsidization is done through product price adjustment (PPA) by which a higher PPA is recovered from products which can bear the loading and a lower or a negative PPA is recovered/ reduced from the price of products which are to be subsidized. At present SKO & LPG supplied to domestic consumers and naphtha, LSHS & FO supplied to Fertilizer units are subsidized through a lower / negative PPA. The bulk of this subsidy is borne by MS, ATF (domestic airlines), LPG (other than domestic), naphtha, FO & LSHS supplied to other than Fertilizer units. The details of product-wise PPA are given.

Product price adjustment

<table>
<thead>
<tr>
<th>Contributors</th>
<th>Rs/SU</th>
<th>Drainers</th>
<th>Rs/SU</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS-87</td>
<td>13521.65</td>
<td>HSD</td>
<td>3797.79</td>
</tr>
<tr>
<td>MS-93</td>
<td>16551.13</td>
<td>LDO</td>
<td>4685.41</td>
</tr>
<tr>
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<tr>
<td>Naphtha (others)</td>
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<td>Naphtha (Fertilizer)</td>
<td>1719.99</td>
</tr>
<tr>
<td>FO (others)</td>
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<td>FO (Fertilizer)</td>
<td>1342.12</td>
</tr>
<tr>
<td>LSHS (others)</td>
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<td>LSHS (Fertilizer)</td>
<td>1532.70</td>
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<tr>
<td>Product</td>
<td>Price</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>---------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATF</td>
<td>7768.79</td>
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<tr>
<td>LPG (pkd-non domestic)</td>
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<tr>
<td>Paraffin wax (pi)</td>
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</tbody>
</table>

These patterns are based on national/ regional demands, logistics of transportation, and co-ordination of the transportation arrangements for crude imports/ coastal movements.

**Pool accounts**

The major pool accounts currently being maintained by OCC are

**Crude Oil Price Equalization account (COPE)**

The difference between the actual FOB cost of crude and the weighted average pooled FOB price included in retention price shall be adjusted in this account.

**Cost & freight adjustment account (C&F)**

Against the Rs640/ SU recovered through selling price of formula products/ transfer price of feedstock for free trade products; oil companies are permitted to adjust the following.

1. Variation in crude oil cost element
2. Difference in ex-refinery / transfer price vis-à-vis retention price
3. Product pattern variation & incentive claims
4. Variation in cost of bitumen drum steel and excise duty thereon
5. Variations in entitlements of LPG / bitumen filling charges
6. Variations in landing cost of imported formula products vis-à-vis ex-refinery price
7. Variations in price realized on export of formula products (net of marketing margins) vis-à-vis ex-refinery price
8. Price/ exchange variation on sale of ATF/ bunkers to foreign airlines/ vessels
9. Variations in retention marketing margins/ RPO & airfield charge as against the weighted average included in price
10. LPG under/ over recoveries including the cost of transportation of bulk LPG from refineries to bottling plants, transportation of packed cylinders to markets
11. Cost escalation claims, wherever permissible
12. Return on incremental net worth on a year to year basis, subject to final adjustment
13. Demurrages with approval of OCC
14. Difference between the actual freight and NRF from pricing point to the distribution point.
15. Subsidy on supply of SKO/LPG to hilly areas.
16. Exchange rate variation on Euro Dollar loans taken by IOC for suppliers credit for import of crude oil/products.
17. Temperature variation allowance given to customers for hot loading of MS, HSD, FO, SKO and LDO at refinery points.
18. Adventitious gains arising due to revision in retention price/ex-refinery price/increases in rail freight.
19. Other adjustments, which may be notified by MOP & NG from time to time.

**Product price adjustment (PPA)**

The fixation of final selling price is done through variation in PPA and this element is surrendered/claimed by oil companies.

**Freight surcharge pool account (FSP)**

Against the surcharge of Rs40/SU of formula products surrendered by oil companies, oil companies make the following adjustments

1. Cost variations on coastal movement of products.
2. Cost variations through rail/road bridging for out-of-zone movements with specific authorization from OCC.
3. Variations in NRF and pipeline transportation cost.

**Sales tax surcharge account (STS)**

Oil companies surrender the surcharge to OCC and claim all under-recoveries on account of CST/irrecoverable sales taxes.

**Self-balancing**

It may be noted that all these accounts were originally conceived and surcharges fixed in a way that each of these accounts are self-balancing and end as a zero sum account. But the accounts have rarely self-balanced due to the following reasons.

- Variations in landed cost of crude/imported products on a sustained basis either due to fluctuations in prices or due to depreciation of rupee or due to changes in customs duty without correspondingly changing the pooled FOB price/final selling prices.
- It may be noted that the current pooled FOB price of crude was fixed in 1986 though the landed cost of crude has significantly increased. It is estimated that if the COPE account is to be self-balancing the pooled FOB Price should be close to Rs4300/mt as against the current price of Rs1700/mt.
- Non-revision of surcharges recovered to compensate for certain costs for long periods
of time, even though the costs have increased over such period of time.

Ad-hoc increases/decreases in PPA for achieving socio-economic objectives of the
Government of the day.

This results in deficits/surpluses to each of these accounts and cumulatively to the oil pool
account. The oil pool generated huge surpluses in the mid-eighties when the international oil
prices were soft; these surpluses were merged by the consecutive Governments, to the con-
solidated fund of India. Since the early 1990's the growth consumption of petroleum products
has been very high and due to distortion in final product prices, the consumption pattern has
changed. In addition, international oil prices have been very firm since the last couple of
years while the rupee has weakened by more than 10% in the last quarter of 1995. Due to
political expediency, no decision was taken to pass on the costs till July '96, even the in-
creases effected in July '96 are highly insufficient to cover the present day costs. The deficit
of oil pool account is therefore ballooning with consequent impact on the bottom-line of oil
companies. It is estimated that the year end deficit would be over Rs150bn.

With the opening of the economy since 1991, the situation in the country has also dramati-
cally changed. The demand for petroleum products have doubled, the investment require-
ments in the sector have substantially grown, the refining sector has been opened up, parallel
marketers have been permitted to market select products and the need for attracting private
capital and foreign direct investment for creation of globally competitive industry.

Need for deregulation

As stated in the chapter on APM, the oil industry is totally controlled and the policies relating
to the industry are fully regulated by the Government of India. Right from the source of crude
procurement, controls exist till the final distribution of finished products, prices, pattern of
production, sales plan of oil companies, product availability, expansion of the industry, and
consequently earnings of the players in the sector. To be fair to policy makers, the current
controls did succeed to achieve macro-economic goals of the Government for more than two
decades. With the ushering of liberalization since early 90's, the situation has however under-
gone a sea change and the policy makers have begun to feel that the APM may no longer
work successfully as it had in the past and the energy security of the country would be under
threat if a robust industry is not created. The factors that have caused this change can be
summarized as under.

A sharp increase in demand for petroleum products and increasingly felt need for
large investments: In the last five years the demand for petroleum products is increas-
ing compounded annual growth rate of about 6% but investments in the industry has
not kept pace with the demand resulting in large imports of crude and finished prod-
ucts. Crude oil production has been plateauing with no new exploratory wells found.
The value of imports has increased from less than US$4bn in 1990-91 to about
US$13bn in 2000. Large imports can have hazardous effect on the macro economic
management, especially the exchange rate and inflation and hence there is need to cap
the imports within manageable levels. All this is possible only if the sector is fully opened to attract substantial foreign and domestic investments.

Difficulties in periodic adjustment of prices resulting in serious financial problems for the industry participants: With the responsibility of fixing the prices of petroleum products, popular Governments postpone the decision of hiking the prices, even when it is inevitable. This has led to burgeoning oil pool deficit that is slowly threatening to get out of control. The only long-term solution to this problem is that the government should get out of the responsibility of fixing prices leaving them to market forces.

Loss of precious foreign exchange due to inefficient use of fuel: Due to cross-subsidization, the market prices of key petroleum products are not reflective of the underlying economic value of the products leading to mass scale inefficiency in use of fuel and sub-optimal inter-fuel substitution. The growth of the industry is more skewed towards subsidized products, resulting in continuous inefficient use of precious foreign exchange.

Need to make available inputs to user industries at competitive prices: Petroleum products are vital inputs to key industries and with the economy opening up for international competition, the user industries can become competitive only if the inputs are made available at competitive prices and not at prices fixed by the government which could be at variance with underlying international prices.

Difficulty in administration of APM: Administration of APM is becoming increasingly difficult with the partial opening up of the sector allowing private sector refineries.

As per the forecasts published by TERI, petroleum consumption is estimated to increase from 97mtpa to 104mtpa in 2001 and grow at 6% and above. The foreign exchange required to meet this demand is massive and thus the foreign exchange reserves could significantly influence the availability of energy and thus economic growth. In this backdrop, the country has been increasingly feeling the need for energy security, which can be achieved only by curbing excessive dependence on oil imports. The Government is aware that this can be achieved only by massive investments in the upstream and the downstream sector and it is estimated that an amount of US$100bn would be required in the next 15 years. Such magnitude of investments can be attracted only if the industry is free of controls.

The concept of APM has also outlived its utility as it has created large oligopolies with no guarantee that the assets are being put to the most optimal use. The cost-plus formula may also not be workable with new private sector entrants into the industry, over whom the Government can exercise little control. Capital generation in the upstream sector has seriously been affected with the artificially low price of crude paid to the two NOCs consequently the E&P activity has not picked up to the desired extent thus resulting in crude oil production stagnating. The price distortions of various products has resulted in inefficient energy use and the luxury of bad energy management cannot be prolonged any further.

The Government is aware that the need of the day is to build a robust and an internationally
competitive industry, which can provide energy security to the country. This can be achieved only by freeing the industry from all controls and by creation of a climate conducive for productive investment in the sector.

**Process of De-regulation**

The process of partial withdrawal of regulation in the sector commenced with the decanalisation of several petroleum products, permission to new entrants to market LPG and SKO, decontrol of lubricants, awarding production-sharing contracts of oil wells and rationalization of tariff structure. In Nov '94, MOP & NG set up a committee under the Chairmanship of Shri U. Sundararajan, CMD of BPCL to provide a framework for the development of Market Determined Price Mechanism (MDPM). The Government also setup a Strategic Planning Group on re-structuring of the oil industry (R-Group) in January 1995 to develop a financially sound and internationally competitive hydrocarbon sector. The R-Group comprises officials from the GOI, economists, eminent personalities from the industry and is headed by Shri Vijay L. Kelkar, Secretary MOP & NG. The Sundararajan Committee presented its report “Hydrocarbon Perspective: 2010 - Meeting the Challenges” in Feb '95 to the R-Group and the Group has acknowledged this report to be an important input in preparation of blueprint for restructuring of the sector.

The R-Group has come out with its first set of recommendations on exploration & production, natural gas and tariff & pricing reforms in September 1996. The second & final report on issues related to energy security, empowerment of public sector and downstream marketing is yet to be released by the R-Group. In its bid to carry forward the recommendations of the R-Group, the Govt. has already announced a new exploration licensing policy (NELP) in Mar '97 incorporating most of its recommendations.