C. P. U. No. 257

COMMITTEE ON PUBLIC UNDERTAKINGS

(1973-74)

FIFTY-SECOND REPORT

ON

INDIAN OIL CORPORATION LIMITED

(REFINERIES DIVISION EXCLUDING PIPELINES SECTION)

(MINISTRY OF PETROLEUM & CHEMICALS)

LOK SABHA SECRETARIAT
NEW DELHI

April, 1974/Vaisakha, 1896 (Saka)

Price : Rs.

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Fifty-Second Report of the Committee on Public Undertakings (1973-74) on Indian Oil Corporation Ltd. (Refineries Division excluding Pipeline Section)

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221	7.89	7	guel	fuel
222	8.22	7	throughout	throughput

CONTENTS

GLOSSARY OF TECHNICAL TERMS USED IN THE REPORT

Av. gas	Aviation Gasoline.
ATF/JP-4	Aviation turbine fuel/Jet fuel oil.
AVU	Atmospheric Vacuum Unit.
AU	Atmospheric Unit.
DPR	Detailed Project Report.
FO	Furnace oil
GSFC	Gujarat State Fertilizer Company
HSD	High Speed Diesel
IK	Inferior Kerosene
IOC	Indian oil Corporation Limited
ISI	Indian Standards Institution
IRL	Indian Refineries Limited
KTU	Kerosene Treating Unit
LDO	Light Deisel Oil
LPG	Liquified Petroleum Gas
LSHS	Low Sulphur Heavy Stock
MS	Motor Spirit
RCO	Reduced Crude Oil
SK	Superior Kerosene
SO_2	Suphur di-oxide
TEL	Tetra Ethyl Lead
Wt. (max.)	Weight (Maximum)

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*Appointed to act as Chairman from 16-5-1973 to 11-7-1973 during the absence abroad of Shrimati Subhadra Joshi.

@Ceased to be a Member of the Committee consequent on his retirement from Rajya Sabha on 3-4-1974

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INTRODUCTION

I, the Chairman, Committee on Public Undertakings having been authorised by the Committee to present the Report, on their behalf, present this Fifty-Second Report on Indian Oil Corporation Limited (Refineries Division Excluding Pipeline Section).

2. This Report of the Committee is based on the comprehensive appraisal of the working of the Indian Oil Corporation Limited (Refineries Division Excluding Pipeline Section) as contained in the Report of the Comptroller and Auditor General of India for the year 1969-70—Union Government (Commercial), Part XI and also of an examination in depth of the working of Indian Oil Corporation Ltd. (Refineries Division Excluding Pipeline Section) upto the year ending 31st March, 1973. The Committee on Public Undertakings took evidence of the representatives of the Indian Oil Corporation Ltd. (Refineries Division) on the 29th and 30th August, 1973 and of the Ministry of Petroleum and Chemicals on the 8th October and 17th December, 1973.

3. The Committee on Public Undertakings considered the Report at their sitting held on 17th April, 1974 and adopted the Report.

4. The Committee wish to express their thanks to the Ministry of Petroleum and Chemicals, the Indian Oil Corporation Limited, the Labour Unions of Indian Oil Corporation (Refineries Division) for placing before them the material and information they wanted in connection with the examination of Indian Oil Corporation Limited (Refineries Division Excluding Pipeline Section). They wish to thank in particular the representatives of the Ministry and the Undertaking who gave evidence and placed their considered views before the Committee.

5. The Committee also place on record their appreciation of the assistance rendered to them by the Comptroller and Auditor General of India in the examination of Indian Oil Corporation Limited (Refineries Division Excluding Pipeline Section).

NEW DELHI;
April 26, 1974.
Vaisakha 6, 1896 (*Saka*).

SUBHADRA JOSHI,
Chairman
Committee on Public Undertakings.

I

INTRODUCTORY

A. Historical Background

The Refineries Division of the Indian Oil Corporation i.e., the erstwhile Indian Refineries Ltd., came into being in August, 1958, with 100 per cent equity capital from Government of India and vested with the responsibility of setting up two oil refineries in the Public sector, one at Noonmati near Gauhati in Assam and other at Barauni in Bihar. The decision to establish these refineries was taken by the Government as a result of the establishment of crude oil reserves near Naharkatiya (Assam) in 1954, which were then estimated at about 40 million tounes. The production and transportation of the crude oil was made the responsibility of a company called Oil India Ltd., in which Burmah Oil Company and the Government of India held 50:50 interest. For the purpose of transportation of crude oil to the above two refineries, Oil India Ltd., constructed a pipeline which has a total length of 720 miles from Naharkatiya to Barauni.

1.2. For distribution of petroleum products from public sector refineries and also from imports, the Government, had set up another company in the public sector in June, 1959, which was known as the Indian Oil Company Ltd. In order to provide for more effective coordination between the refining and distribution activities in the Public Sector, the Government of India issued an order called the Petroleum Companies Amalgamation Order, 1964 dated 31st August, 1964, according to which Indian Refineries Limited was dissolved and merged with the Indian Oil Company Limited. The new compnay after merger came to be known as Indian Oil Corporation Limited with effect from 1st September, 1964, with two independent divisions called the Refineries Division and the Marketing Division, each under a separate Managing Director.

1.3. Subsequently, by another order issued by the Government another division in the Corporation was created on 4th March, 1965 and came to be known as the Pipelines Division under a Director-in-charge. This Division was, however, later abolished (on 23rd February, 1968) on the recommendations of the Committee on Public Undertakings in Para 35 of their Thirty-Sixth Report (Third Lok Sabha) and its work has since been taken over by the Managing Director of the Refineries Division and this division is now known as Refineries and Pipeline Division.

1.4. The third refinery in the public sector has been set up at Jawaharnagar in Gujarat. This refinery was initially under the charge of ONGC

but on 1st April, 1965, it was transferred to the Refineries Division of the Indian Oil Corporation.

1.5. In September, 1967, the Government of India decided that the Refinieries Division of IOC should assume charge of construction and operation of Haldia Refinery (West Bengal) also.

1.6. A feasibility report on the setting up of a 6 million tonnes per annum refinery on the North West Region was submitted by the Indian Oil Corporation to the Government in May, 1971. In June, 1972 the Government announced its decision to establish a refinery at Mathura (U.P.). The Cabinet approval for the Mathura Refinery Project was given in August, 1973.

1.7. The Indian Oil Corporation Limited are now in charge of three refineries at Gauhati, Barauni and Gujarat already in operation and fourth refinery at Haldia which is scheduled to be completed by the end of 1974. The fifth refinery would be at Mathura regarding which various preliminary steps have already been taken in order to commence the actual construction as early as possible.

B. Refineries under the Charge of Indian Oil Corporation

(i) *Gauhati Refinery*

1.8. The construction of Gauhati Refinery, the first public sector refinery in India was started in October, 1959 with a processing capacity of 7,50,000 tonnes per annum with the Rumanian technical and financial assistance. The refinery was commissioned on 26th December, 1961.

(ii) *Barauni Refinery*

1.9. The Barauni Refinery has been set up with Soviet technical and financial assistance and went into trial operations in July, 1964. Its initial processing capacity of 2 million tonnes of crude oil per annum was expanded to 3 million tonnes in January, 1969.

(iii) *Gujarat Refinery*

1.10. The Gujarat Refinery has been set up in technical collaboration with the USSR. The refinery with an initial capacity of two millon tonnes per year was commissioned in June, 1966, the capacity was subsequently expanded to three million tonnes in September, 1967.

(iv) *Haldia Refinery*

1.11. The construction of the refinery at Haldia with an annual processing capacity of 2.5 million tonnes was entrusted to the Corporation on 18th September, 1967. The Refinery is being established in collaboration with Messrs. TECHNIP/ENSA of France (main refinery) and Messrs. Industrial Export of Rumania (Lube Oil portion). Messrs. Engineers India Ltd. another Government undertaking are being associated with the foreign

collaborators in the development technological process, procurement of indigenous equipment and for assistance in the supervision and construction of the Refinery.

1.12. As per the original time schedule, prepared in August, 1967 the main Refinery was expected to be completed by second half of 1970 and the Lube Oil Units by early 1971. The refinery has, however, not been commissioned so far. It has been stated that the fuel sector of the Refinery is likely to be completed by the middle and the lube sector by the end of the year 1974.

Mathura Refinery

1.13. A new Refinery with a capacity of 6 million tonnes per year is being set up at Mathura in U.P. The refinery which is estimated to cost Rs. 96.85 crores is expected to be completed and commissioned in mid 1978. The Refinery is being designed to process a wide variety of crude oils available in the West Asian Region. The Refinery Project is being set up with Soviet collaboration. In pursuance of the above agreement, a contract has been signed on 6th December, 1973 between IOC and the USSR agency for rendering technical assistance for the construction of the Refinery.

C. Examination of Refineries Division of the Indian Oil Corporation Ltd. by the Committee on Public Undertakings and Estimates Committee.

1.14. The Committee on Public Undertakings examined the working of the Refineries Division of the Indian Oil Corporation Limited in their Thirty-sixth Report (Third Lok Sabha) March, 1967. The action taken by Government on the Committee's Thirty-Sixth Report is contained in their Twenty-Fourth Report (Fourth Lok Sabha) January, 1969.

1.15. The Estimates Committee (Fourth Lok Sabha) examined the Ministry of Petroleum and Chemicals and gave their Fiftieth Report (April, 1968) on Petroleum and Petroleum Products. The action taken by Government on the 50th Report is contained in the 103rd Report of the Estimates Committee (Fourth Lok Sabha) February, 1970.

1.16. The present examination by the Committee on Public Undertakings covers Refineries under the charge of Indian Oil Corporation Ltd.

II

EXPANSION OF BARAUNI REFINERY AND SETTING UP OF A NEW REFINERY IN ASSAM

A. Setting up of Atmospheric Unit III at Barauni

In the context of the emergency following the Chinese aggression of late 1962, Government decided to expand the public sector refineries at Gauhati, Barauni and Koyali to process 1.25, 3 and 3 million tonnes per year respectively. Accordingly, a decision was taken to expand the refinery processing capacity of Barauni Refinery from 2 million tonnes to 3 million tonnes of crude oil per annum by adding a third Atmospheric unit and the decision was conveyed by Government of India to the Corporation in January, 1963.

2.2. Based on the decision of Government in principle to the expansion of Barauni refinery and the approval for the signing of an agreement with the Russians for preparation of a project report, the Indian Refineries Ltd. executed a contract in December, 1963 with Tiajpromexport for preparation of project report. The Detailed Project Report was received in March, 1964. This was examined by the IRL engineers in consultation with Soviet specialists and the collaborators were requested to make certain modifications of a major nature in DPR. On 11th January, 1965 an amount of Rs. 2.76 crores including Rs. 80 lakhs foreign exchange was sanctioned for the expansion scheme. After Government's approval was given, a contract was signed with the Soviet Organisation on 11th January, 1965 and the construction started in September, 1966 scheduled to be completed in the first part of 1968. But due to the delay on the part of civil engineering contractors and the poor output of departmental labour, the construction was completed only in November, 1968 and the unit was formally commissioned in January, 1969.

2.3. In this connection it was stated that at the time Government took the decision in 1963 to expand the Barauni Refinery, the ONGC had discovered the Rudrasagar Oil field in Upper Assam. ONGC indicated that the estimated production from Rudrasagar field was 0.75 million tonnes per year for a 15 to 20 years period and this figure was likely to be modified as a result of other works being done in the area. ONGC also stated that there was very hopeful possibililty of Lakwa turning out to be a commercial exploitable field and ONGC assured a production of at least 0.25 million tonnes of oil from it by 1966. The approval of Government for the expansion scheme of Barauni Refinery was given on the basis of this assurance that adequate additional crude would be available from Assam Oil fields

and would be transported in the existing pipeline of O.I.L. from Moran to Barauni by upgrading its capacity from 2 million tonnes to 3 million tonnes and by expanding the crude oil conditioning plant at Moran at an estimated cost of Rs. 6 crores.

2.4. For the transportation of the additional crude produced from the ONGC fields to the Barauni Refinery for feeding the third million tonnes unit, it was necessary to secure an agreement between Oil India Ltd. and ONGC. As no agreement could be reached between the two parties, Government in March, 1968 appointed a Committee with Chief Cost Accounts Officer, Ministry of Finance, as Chairman to suggest a suitable tariff. This Committee submitted its report in April, 1969 but could not arrive at any agreement acceptable to the two parties. An interim agreement was ultimately reached in March, 1971. However, it was stated that the delay in arriving at the interim agreement did not come in the way of ONGC crude flowing through the pipeline. In fact, ONGC started pumping comparatively small quantities of its crude through OIL pipeline even as early as July, 1968. In 1969, 1.9 lakh tonnes of crude and in 1970, 1.68 lakh tonnes of ONGC crude were transported through the pipeline.

2.5. In the meantime, as public opinion was building up in Assam in favour of further refining of Assam crude in Assam itself, Government in December, 1969 announced their decision to set up a new refinery in Assam and to permit the Barauni Refinery to secure crude for its third unit from other sources including import.

B. Utilisation of Capacity in Atmospheric Unit III

2.6. As soon as the question of additional refining capacity in Assam and the utilisation of the additional crude from the ONGC fields in Assam was decided, it became necessary to locate crude for operating the third million unit at Barauni Refinery. Since, this could be done only by importing crude at Barauni, the matter of modifying the refinery to process the imported crude and laying of a new product pipeline from Haldia to Rajbandh was taken up. The necessary feasibility reports etc. were prepared and approval to the scheme was accorded in June, 1971. The modifications/additions were estimated to cost Rs. 7.7 crores and the laying of new pipeline Rs. 6 crores.

2.7. As against the designed capacity of 10 lakh tonnes per annum the estimated quantity of Assam crude processed in Atmospheric Unit III was as follows:—

	Tonnes
1968-69 (January-March, 1969)	0·34 lakh
1969-70	0·24 "
1970-71	Nil
1971-72	1·6 "
1972-73 (Upto November, 1972)	1·20 "

2.8. According to Management (July, 1971) the Unit was operated during 1968-69 and 1969-70 mainly to observe in detail the performance of various equipments and to assess the possibility of various adjustments to optimise the product yield. During 1971-72 and upto November, 1972 it was utilised (57½ days) for processing the available indigenous crude during shut down maintenance periods of AVU's I and II since December, 1972 AU III was operated for processing the imported crude after carrying out minor modifications. It was stated that it was now possible to process imported crude in the refinery at 0.5 to 0.7 million tonnes per year depending on the quality of imported crude. A quantity of 1.30 lakhs tonnes was of imported crude processed in this Unit during December, 1972 to 31st March, 1973.

2.9. The Committee enquired as to why the processing of imported crude could not be started earlier in Atmospheric Unit III. In a written reply the Ministry stated as follows:—

"Processing of imported crude could not be started earlier in Atmospheric Unit III mainly because of two reasons. They are (i) corrosion in the plants on account of use of high sulphur crudes and (ii) Problem of finding a suitable crude.

Atmospheric Unit III is not able to process high sulphur crude because it is made of mild steel and has been designed on Assam crude. If high-sulphur and corrosive Middle Eastern crude ore processed in the Unit, the Unit would suffer corrosion on account of inter action of sulphur with the metal. Some efforts were made prior to 1972 in trying to locate a crude suitable for processing at Barauni, but this did not succeed. The only crudes available were crudes from the Middle-East and most of them were known to be corrosive. Under the circumstances if these crudes were used the corrosion would have been such that the processing could not have continued for more than a few months. This did not appear to be a satisfactory approach.

However, processing of high-sulphur crude became possible when a suitable crude was located in 1972. North Rumaila crude contains sulphur but is not so corrosive as most of the other Persian gulf crudes are, because this crude does not contain Hydrogen Sulphide and mercaptans. Because of these reasons, the processing unit will suffer very much less corrosion than when processing other crudes. Secondly the products, such as kerosene and naphtha do not require removal of hydrogen sulphide and mercaptans. Barauni Refinery has no treatment units for this purpose and therefore, crudes other than North Romaila would not have been suitable. Other crudes would

have posed serious problems in meeting the product specifications.

Also it may be recalled that there was a surplus of naphtha and heavy residues in 1970 and 1971 in Eastern India. Even naphtha produced from the indigenous crude had to be transported to Halda and from there to Madras, because of lack of demand in the Eastern area. Additional production of naphtha arising from the imported crude would have increased the surplus position and movement of surplus production to Haldia would have become impossible because when the imported crude is being carried through the existing Haldia-Barauni pipeline, this would not have been available for movement of products from Barauni to Haldia. Similarly, the residual oil would have a surplus product and could have posed problems in marketing."

C. Economics of change over from Indigenous Crude to Imported Crude

2.10. As regards the economics of change over from indigenous crude to imported crude the Management stated as follows:—

"The present scheme envisages processing of 2.2 million tonnes of indigenous crude upto 1980-81 (upto which time we have assured of Assam Crude for this refinery) and processing of imported crude to utilize the capacity of the third unit which was remaining idle till November, 1972. We have started processing imported crude to utilize this capacity. The processing of imported crude is being done in two parts—Part I to process 0.5 to 0.7 million tonnes of imported crude with the existing facilities with only minor modifications and part II to process 1.2 million tonnes per annum of imported crude so as to raise the capacity of the refinery to 3.4 million tonnes.

Part I of the scheme has already been carried out by processing imported Iraqi crude from November, 1972 onwards. The quantities of imported crude that had been processed depended upon the crude actually received at the refinery. The economics of processing .7 million tonnes throughout would indicate that after the revision of the product prices to match a crude price of US $2.38 per barrel, the processing of Iraqi crude would be profitable to the Refineries Division and would be of the order of Rs. 18 lakhs per annum. In the period earlier to June, 1973/August, 1973 before revision of product prices, the processing of the imported crude was not advantageous particularly in the context of extra expenditure incurred at

the initial stages towards lightening of the vessels/dead frieh ing of the vessels used for transportation of crude oil to suit Haldia draft. The above economics does not also take into account the cost of transportation of crude oil from Haldia to Barauni.

As regards the processing of imported crude at the 2nd stage when 1.2 million tonnes of imported crude will be processed, the economics indicate that the refineries would be losing about Rs. 85 lakhs per annum. This economics is based on the following assumptions:—

(1) For processing 1.2 million tonnes of imported crude, we have to enter into fresh agreements for supply of crude oil. Considering the continuous spirling of crude oil prices, the ex-refinery prices of products also may rise correspondingly. However as per the present practice, it is assumed that the product prices will not be neutralised fully to meet the increased crude price. A differential of 15 US cents per barrel as the element not neutralised as assumed. Thus in working out the economics the crude price has been assumed to be US $2.53 per barrel while the product prices have been assumed as equivalent to a crude price of US $2.38 per barrel while in actual practice during 1976 the prices of both products and crude oil may be different than the ones assumed in the calculations.

(2) The production potential of LPG at 3 4 MMPTA level will increase to 42600 tonnes. The includes 13800 tonnes of LPG which can be produced from the Coking and Crude Distillation Units. Since this LPG potential is available even when processing 2.2 million tonnes of Assam crude, the adjustment has been made accordingly in the sale realisation by deducting the value of 13800 tonnes of LPG and the credit for the balance quantity of 10800 tonnes has been made in the differential realisation.

(3) In the above calculations it has been assumed that LR-1 tankers would be available for transportation of imported crude. Presently Haldia port does not have sufficient draft handling tankers of the size 80,000 to 90,000 DWT. It is, however, presumed that the draft available at Haldia port in 1976 would be of the order of about 35 feet and the large tankers, which are already on order with the Shipping Corporation would be dead-freighted to suit the draft conditions at Haldia. If this is not possible in

1976 due to port facilities at Fao being incomplete we may have to continue the existing arrangement of transporting the crude in MR and GP vessels in which case the freight rate is likely to be of the order of about Rs. 85 per tonne as against Rs. 40 per tonne assumed in above calculations. This will result in a further loss of about Rs. 540 lakhs per annum for 1.2 million tonnes."

2.11. During evidence, the Committee enquired whether the financial implications and economics of setting up the refinery at Bongaigaon and keeping the Atmospheric Unit III idle or under-utilised had been studied. The Additional Secretary of the Ministry stated as follows:—

"I admit that no details of the financial implications and economics of setting up a new refinery at Bongaigaon while keeping this Unit idle was really worked out."

2.12. Asked about the estimated cost of setting up a new Coastal refinery of this capacity to process imported crude, in a written reply it was stated as follows:—

"The cost of setting up of a refinery depends on various factors like the establishment of secondary processing facilities, number and nature of units, types of products desired etc. very roughly the cost of setting up a new refinery with one million tonnes capacity to process imported crude at a coastal location may be of the order of Rs. 20 to 25 crores."

D. Effect of Idle Capacity in Atmospheric Unit III

2.13. As regards the effect of idleness/under-utilisation of Atmospheric Unit III on the working of other units of Barauni Refinery, it was stated that:—

"at the time the expansion of Barauni Refinery was decided, no additions to the secondary processing units over and above the capacities established as part of 2 million tonnes of refinery were made. If AU-III were in regular operation during the years 1969-70 and onwards processing indigenous crude, if would have been possible to utilise the KTU-B partially for obtaining SK. The utilisation factor would have been of the order of 24 per cent to 34 per cent during the years 1969-70 to 1972-73. The loss in revenue due to non-operation of KTU-B to the above extent is about Rs. 15 lakhs for the years from 1969-70 to 1972-73."

It has been stated that as the quantum of imported crude increases, the Kerosene Treating Unit I, which is presently in operation, will also progressively become under-utilised.

2.14. In this connection, the Secretary of the Ministry stated during evidence as follows:—

> "The plan of the third Unit proceeded, the assumption that it would utilise Assam crude and on the basis that in an emergency, some other suitable crude would become available. I must confess that at that time, no detailed analysis of crude likely to be available was made; perhaps if we go into the matter now, we could find that the refinery should perhaps have been planned on a more diverse quality of crude and wider range of crudes than was done. In the Mathura Refinery and in the decision to expand the Koyali refinery during the Fifth Five Year Plan we are providing for a refinery capacity of a nature that will take a broad range of crude. It is possible to do so; but I am afraid, it was not done in Barauni. That is the basis for all that transpired subsequently in Barauni."

2.15. The Committee enquired whether or not the subsequent developments indicated that there was a serious lacuna in the decision taken by Government. The Secretary of the Ministry stated as follows:—

> "In addition to all that I have submitted there were delays in the utilisation of the products of the Barauni Refinery. The LSHS was proving a very difficult product to handle. Naphtha, of course, was in excess at that time. LSHS was proving a major bottleneck and the Refinery had to run at lower capacity, because the Barauni Thermal Station was not ready to receive the LSHS. This is one lacuna that occurred. This continued until 1970, but the only additional point that I would like to submit is that the lacuna in the decision taken by Government if I may submit with respect to Government and this Committee, was that the decision was altered after it had been taken and the circumstances developed in such a way that Government was required to alter the decision that Assam crude would be refined in Assam to the extent of one additional million tonne."

2.16. Asked about the loss incurred because of non-utilisation of Atmospheric Unit-III, it was stated by the representative of the Ministry during evidence that:—

> "This is only a theoretical exercise—the loss suffered by the Barauni Refinery as a result of under-utilisation would be approximately Rs. 17 lakhs on account of interest and depreciation charges. National loss in terms of foreign exchange would be of the order of Rs. 6 crores per year."

Asked about the cost of personnel, it was stated that "this figure can also be added."

2.17. The Committee note that the Atmospheric Unit-III at Barauni was approved by Government on the basis of an assurance given by ONGC that additional crude would be available from Rudrasagar and Lakwa oil-fields and the presumption that it would be transported through the Oil India Ltd. pipeline from Barauni to Moran by upgrading its capacity and by expanding the crude oil conditioning plant at Moran. Although the Unit was commissioned in January, 1969, it had to remain idle/under-utilised for want of indigenous crude as no reasonable agreement could be reached between the ONGC and the Oil India Ltd. regarding the tariff of transportation of ONGC crude through the crude oil pipeline of Oil India Ltd. Only an interim agreement between ONGC and Oil India Ltd. could be reached in March, 1971 after protracted negotiations lasting for more than 4 years. When the negotiations were still going on, the Government decided in December, 1969 to set up a new refinery in Assam to process the Assam crude and to permit the Barauni Refinery to secure crude for its third unit from other sources including import. As a result, the utilisation of the available capacity was held up and modifications will have to be made in the refinery for processing imported crude at an estimated cost of Rs. 7.7 crores and a new pipeline would be required to be laid from Haldia to Rajbandh at a cost of Rs. 6 crores. Meanwhile, processing of the imported crude in the unit had been started from December, 1972 and it could process 5 to 7 lakh tonnes per annum after minor modifications. From December, 1972 to 31st March, 1973, 1.3 lakh tonnes of imported crude had been processed in this unit.

2.18. The Committee regret to note that because of the delay in arriving at a decision about the tariff for transportation of crude through the Oil India Pipeline, the Atmospheric Unit-III which was commissioned as early as January, 1969 had to be kept idle or under-utilised, resulting in a notional loss of the order of Rs. 6 crores per annum in terms of foreign exchange and Rs. 17 lakhs per annum on account of interest and depreciation charges alone. The loss would be more if the cost on account of personnel is also added. The under-utilisation of the Unit had also affected the working of the Kerosene Treating Unit and the consequential revenue loss is stated to be of the order of Rs. 15 lakhs during the period 1969-70 to 1972-73. The Committee were informed that as the quantum of imported Crude increases, the Kerosene Treating Unit-I which is at present in operation would become progressively under utilised.

2.19. The Committee were informed that as a result of the change over from indigenous to imported crude, there would be a recurring loss of Rs. 85 lakhs per annum on the assumption that the Corporation would be able to get LR-I tankers for transportation of imported crude and in

case the existing arrangements for transporting imported crude continue, the Corporation would be losing another Rs. 540 lakhs per annum. The whole economics of utilisation of imported crude is stated to have been worked out taking the price of imported crude at US 2.38 dollars per barrel. The Committee need hardly point out that these economics are bound to be adversely affected because of the latest price spiral of the imported crude.

2.20. The Committee also regret to note that decision once taken about the expansion of the Barauni Refinery based on utilisation of indigenous crude from Assam was altered in favour of setting up of a new refinery in Assam and the decision taken to process crude from other sources including imported crude in the Barauni Refinery. The Committee fail to understand as to why the financial implications and economics of setting up a new refinery in Assam keeping the third installed unit of Barauni idle/ under-utilised had not been worked out before the decision to set up a new refinery in Assam was taken.

2.21. It was admitted during evidence that the Barauni Unit could have been planned on a more diverse quality and wide range of crude than was done. The Committee feel that had this been done, the Corporation would not have been faced with such a situation as indicated above.

2.22. The Committee take a serious view of the huge loss suffered by the Government/Corporation as a result of taking up the expansion of the Barauni Refinery first on the basis of indigenous crude and later switching over to imported crude.

2.23. The Committee recommend that the entire matter should be thoroughly investigated by a high level Committee so that the shortcomings/ lapses at different stages are pin-pointed to obviate such costly lapses in future.

E. Setting up of a new Refinery in Assam

2.24. As public opinion was building up in Assam in favour of further refining of Assam crude in Assam itself, and public agitation became intense in 1968 and early 1969, Government in April, 1969 appointed a Committee to make a techno-economic study on the feasibility of additional refining capacity in Assam to process Assam crude. The Committee submitted their report in September, 1969.

2.25. That Committee were of the view that the crude available in Assam should be supplied on priority to the three refineries at Digboi, Gauhati and Barauni to enable them to operate at their designed capacities and at higher capacities which could be achieved with marginal additional investment. They also observed that these refineries were designed

specifically to process the low sulphur crude oils from the Naharkatiya-Moran fields. It was not possible to process imported high sulphur crude oils in these refineries without extensive modifications which may involve, in addition to the provision of new lining in the fractionating towers and transfer lines, the installation of secondary processing units like Reformer, Desulphurisation Unit and Visbreaker, at considerable cost. Since the rate of crude oil production from the Assam oil fields in the foreseeable future was expected to be considerably less than the optimum capacities of the refineries at Digboi, Gauhati and Barauni, it was not considered necessary to create additional refining capacity of the conventional type for processing crude oil estimated to be available from Assam. The Committee, however, observed that refining of crude oil for the production of conventional petroleum products was not the only optimum way of utilising the crude oil and processing of crude oil as chemical feed-stock for the production of aromatics, ammonia and ethylene based petro-chemicals would also present attractive economic possibilities.

2.26. The Ministry have stated that in December, 1969 on overall national considerations, Government took a decision to increase the refining capacity in Assam by 1 million tonnes either by building a new refinery or by expanding the existing refinery, and to permit the Barauni Refinery to secure crude for its third unit from other sources including import.

2.27. After the decision was announced, a working Group was constituted to complete the techno-economic feasibility studies of both the alternatives. The Group submitted its report in June, 1970 and recommended expansion of Gauhati Refinery. Assam Government suggested addition of a whole range of down stream petro-chemical units involving a very large investment. They proposed a separate grass-root refinery with a complete petro-chemical complex. In October, 1970 it was, therefore, decided to set up a one-million tonne refinery at Bongaigaon with a petro-chemical complex. Assam Government agreed to this proposal in December, 1970 and also suggested transportation of crude by Inland Water Transport Corporation. The feasibility report of Bongaigaon Refinery was submitted to Government in June, 1971. After detailed examination of the feasibility report, the final investment decision for the setting up of a refinery at Bongaigaon at an estimated cost of Rs. 14,90 crores and a petro-chemical complex at an estimated cost of Rs. 66.20 crores was taken in March, 1972.

2.28. For carrying crude from Upper Assam to Bongaigaon refinery, the Assam Government proposed transportation by barges. This was considered in detail in consultation with Ministry of Transport and Shipping, Central Inland Water Transport Corporation and the Planning Commission and finally it was decided in July, 1972 that the crude to Bongaigaon

should be carried through Oil India Ltd. pipeline which should be suitably expanded for this purpose and a crude conditioning plant established at Moran.

2.29. The work on the project was stated to be at the preliminary stage and the refinery was expected to be completed by 1976.

2.30. In a note submitted to the Committee Government have stated that "the utilisation of the idle capacity in the Barauni Refinery and the realisation of additional refinery capacity in Assam are linked together and delays are on account of delays in coming to a final decision on the implementation of the Government's decision regarding the additional capacity in Assam. Only when a decision on the Bongaigaon Refinery could be finally taken that the decision to import the crude to Barauni could be taken alongwith other consequential decisions such as utilisation of the Haldia-Barauni pipeline for crude transport and the laying of a product pipeline from Haldia to Rajbandh".

F. Economics of setting up of the new Refinery at Bongaigaon

2.31. About the economics of setting up the refinery at Bongaigaon, the Secretary of the Ministry stated during evidence as follows:—

II

"The refinery itself will lose money varying from Rs. 77.05 lakhs in the first year to Rs. 17.25 lakhs in the tenth year of operation. The net loss during the ten year period would be of the order of Rs. 5.5 crores. The financial results will depend on the product price and crude oil prices and also on the price of low sulphur heavy stock to be supplied to the Sindri Fertilizer Plant which is being modernised to use this stock. The refinery profitability will be poor on account of larger production of low value products like naphtha, LSHS, etc. If it were to produce a larger volume of motor spirit the economics would improve and it would only show a marginal loss from the third year. But advisedly that product pattern is not being adopted. The petro-chemical complex will yield a return of 38.3 per cent on capital employed of Rs. 66.2 crores and the integrated operation is expected to bring a return of 20 per cent on capital employed."

2.32. The Committee find that though the Expert Committee constituted by Government to study and report on the techno-economic feasibility of locating the additional refining capacity in Assam had recommended in September, 1969 that it was not necessary to create additional refining capacity of the conventional type for processing the crude oil estimated to be available from Assam and that the processing of imported

crude at Barauni would involve considerable cost, Government, in December, 1969 announced their decision to increase the refining capacity in Assam by one million tonnes either by building a new refinery or by expanding the existing refinery at Gauhati and to permit the Barauni Refinery to secure crude for its third unit from other sources including import. In October, 1970, Government decided to set up a one million tonnes refinery at Bongaigaon with a petro-chemical complex and the investment decision thereon was taken in March, 1972. The Committee are constrained to observe that the delay in coming to a final decision on the implementation of the Government's decision regarding the setting up of the additional capicity in Assam had resulted not only in non-utilisation of the capacity available in the Barauni Refinery and the processing of the available indigenous crude in Assam but also delayed the creation of additional refining capacity in the Public Sector. The Committee recommend that these aspects of delays should also be examined by the high level Committee suggested earlier for Atmospheric Unit III of the Barauni Refinery so as to elimnate them in future.

III

HALDIA REFINERY

A Selection of site for the Refinery

The site selection Committee appointed by Government of India in January, 1964 recommended the location of the refinery at Haldia, one of the considerations being the easier availability of land at low cost and of fresh water from the tube wells.

Acquisition of land

3.2. The land for Haldia refinery had to be acquired on lease basis, as the owner (Calcutta Port Commissioner) did not agree to sell the land. The terms of the lease are:—

(a) Rent will be paid at the rate of:—

1. Rs. 60 per acre per month for the land (about 400 acres) for main refinery; all further work like filling, levelling the site, etc. will be done by the Company; and

2. Rs. 150 per acre per month for the land (about 100 acres) for township, filling/levelling of site and provision of basic development facilities will be done by the Calcutta Port Commissioner.

(b) There will be no increase in rent for a period of 20 years, calculated from the date the Refinery goes into production. Thereafter the rent may be revised after each succeeding period of completed 10 years subject to the condition that the increase will not exceed 10 per cent. of the rent charged for the preceding period.

3.3. On the above basis, the yearly rent for the land (about 500 crores) works out to Rs. 3,60,000 as detailed below:—

1. Refinery—400 acres @ Rs. 720 per acre per year .	2,88,000
2. *Township—100 acres @ Rs. 720 per acre per year . .	72,000
	3,60,000

*Calcutta Port Commissioners have agreed to charge a rent of Rs. 60 per acre per month upto July, 1973 by which time they expected to complete all development facilities.

3.4. 335.124 acres of land was handed over by the Calcutta Port Commissioner on 5th February, 1969 to the Undertaking. The ramaining land could not be handed over as the old tenants had brought an injunction from the court. The Committee have now been informed that the injunction has been vacated and an area of about 2,812,565 sq. metres of land in addition to 335.124 acres already handed over in 1969 has been handed over to the Indian Oil Corporation. An additional area of 15,000 sq. metres of land was also handed over at the same time. The agreement stipulating the terms and conditions of lease for the land has not yet been finalised.

3.5. The Management stated that draft lease agreement received from the Calcutta Port Commissioner had been returned to them (CPC) with observations in 1972, for amendment/clarification and the reply was still awaited.

3.6. During evidence the representative of the Ministry stated "unfortunately the lease agreement between the Calcutta Port Commissioner and IOC has not yet been finalised and this has been under discussion. There are some points of disagreement. There are some difficult conditions to abide by, but these would be sorted."

3.7. The Committee pointed out that the land for Gauhati, Barauni, Gujarat and Madras Refineries had been acquired on ownership basis but the land for Haldia had been acquired on lease basis. They enquired about the reasons for the same. The position was explained as follows:—

> "Whereas in the case of other refineries, we have acquired land, in this case we have been paying lease amount of Rs. 3,60,000 lakhs every year. When we decided on setting up this refinery, the Calcutta Port Commissioner had already acquired and taken necessary steps to acquire the land in that area, and as such we had no other alternative, but to take the lease out of the land acquired by Calcutta Port Commissioner. Calcutta Port Commissioners Act precludes any sale of land, it only provides for lease of land."

Tube Wells

3.8. The Site Selection Committee had assumed that such tubewell would yield one million gallons of fresh water per day. The Geological Survey of India, however, indicated (August, 1969) that half of the area in which the refinery was to be located would hardly have any suitable acquifier for yielding water while the remaining half might yield 0.5 million gallons per day per tube well sunk in that area. The requirement

of water to the tune of 6 million gallons per day will be met through 11 tubewells estimated to cost Rs. 20.15 lakhs.

3.9. The Committee enquired about the basis on which the assumption was made by the Site Selection Committee. In a written reply the Ministry have stated that "the assumption about the yield of tube wells was based on the assessment made by the Ground Water Division of the Geological Survey of India."

3.10. So far 10 numbers of tube wells, each yielding water at the rate of 0.36 mgd. to 0.96 mgd. working 24 hours a day have been sunk at a total cost of Rs. 16.38 lakhs as on 28th Februay, 1974.

3.11. The Committee find that one of the considerations for locating the Refinery at Haldia was the easier availability of land at low cost. The Committee were, however, informed that even when the decision to set up the Refinery was taken, land had already been acquired by the Calcutta Port Commissioner and the Corporation was faced with a fait-accompli to take over this land on a lease rent of Rs. 3.60 lakhs per year. The undertaking would thus be saddled by a recurring liability.

3.12. The Committee regret to note that although 335 acres of land was taken as early as 1969, no agreement stipulating terms and conditions of lease has so far been finalised. The Committee recommend that the Government/Corporation should take up the matter at the approprite level with a view to finalise the agreement without further delay.

3.13. The Committee understand that one other consideration for locating the refinery at Haldia was the easier availability of fresh water from the tubewells. The Committee find that this benefit has also not been actually realised. The Site Selection Committee had assumed that each tube well would yield one million gallon of fresh water per day, and this assumption was stated to be based on the assessment made by the Ground Water Division of the Geological Survey of India. The Committee are surprised to note that Geological Survey of India had, however, indicated in 1969 that half of the area in which the Refinery was to be located would hardly have any suitable acquifer for yielding water while the remaining half might yield 0.5 million gallon per day per tube well sunk in that area.

3.14. The Committee recommend that the matter regarding conflicting assessments made by the Geological Survey of India may be investigated in order to fix responsibility and avoid recurrence of such wrong assumptions in the framing of project details.

B. Project Estimates

3.15. When the Haldia refinery was entrusted to the Company on 18th September, 1967 the detailed project cost was not available. Government informed the Company in January, 1968 that the Refinery would be more or less similar to the Madras Refinery which was under construction at that time and it was assumed that the cost of the Haldia Refinery could vary to the extent of 5 per cent. from the cost of the Madras Refinery. Accordingly, on the basis of the estimated cost of the Madras Refinery at Rs. 43.72 crores the cost of the Haldia Refinery was estimated (in January, 1968) at Rs. 46 crores. On 1st March, 1969 the Government authorised the Company to sanction individual works, irrespective of their value within the overall limit of Rs. 46 crores and to send the detailed project estimates after the bids of the French and Rumanian collaborators had been finalised.

3.16. On 7th January, 1970 the project cost was estimated by the Company at Rs. 71.44 crores and was revised to Rs. 67.51 crores on 14th September, 1970. The Government approved the Project cost estimate of Rs. 67.50 crores on 3rd July, 1972. The actual expenditure incurred as on 31st March, 1973 was Rs. 51.47 crores including foreign credits of Rs. 9.10 crores.

3.17. The Committee enquired about the basis on which it was assumed by Government that the cost of Haldia Refinery would be almost equal to that of Madras Refinery when the technical collaboration as well as the location for the two refineries were different. In a written reply, the Ministry stated as follows:—

> "The processing capacity of the Haldia Refinery is the same as that of Madras Refinery viz. 2.5 million tonnes per year. Haldia Refinery was to produce like Madras Refinery, in addition to the normal fuel products 200,000 tonnes of lube oil and 80,000 to 100,000 tonnes of bitumen. The product pattern of these two refineries were similar and thereby similar processing facilities were envisaged except for marginal differences. The various other units in the two refineries were to be of similar sizes except for marginal differences. The offsite facilities required at these two locations were also envisaged to be of similar nature."

3.18. About the wide difference between the estimate of the Haldia Refinery and that of the Madras Refinery it was stated that the work on Madras Refinery was started in 1966-67 and completed in 1969, whereas

work in Haldia refinery was started in 1969-70 and the work was still in progress. The total cost of Madras Refinery was Rs. 44.38 crores. The increase in the case of Haldia Refinery was stated to be due to the following factors:—

		Rs. in crores
(i)	Price Escalation	6·36
(ii)	(a) Increase in payment of Engineering fees and royalities	0·66
	(b) Increases in payment of pro urement and construction supervision Services	2·86
(iii)	Financing charges	1·10
(iv)	Increase in cost of equipment (because of increased hardware etc.)	5·64
(v)	Extra cost due to peculiar location of Haldia, extra civil works, soil conditions etc. . . .	3·09
(vi)	Provision of marketing facilities and port facilities .	2·69
(vii)	Township .	0·72*
	TOTAL :	23 12

3.19. The detailed reasons for increase in the capital outlay were stated to be as follows:—

(a) *Increase on account of price escalation and payment of higher engineering fees, procurement and construction supervision services.*

Haldia Refinery was expected to be commissioned after nearly 5 years of the commissioning of the Madras Refinery. The increase on account of escalation in prices both in the case of indigenous as well as the imported items worked out to be of the order of 5 per cent per annum which was not unusual.

(b) *Increase in cost of equipment viz. Rs. 5.64 crores*:

(i) In the case of the Haldia Refinery, there was maximum emphasis on indigenisation and opportunity was taken to involve Indian Engineers to the extent possible in the design work;

(ii) Haldia Refinery had a PDA (Propane De-Asphalting) Unit and units of caustic and water-wash for naphatha, which did not exist at Madras (estimated to cost Rs. 80 lakhs).

*Including items attributable to the Marketing Division.

(iii) Haldia Refinery was being designed with an inbuilt capacity of 3.5 million tonnes per annum which could be reached with the installation of some balancing equipment; the additional cost was estimated at Rs. 1.60 crores.

(iv) The capacity of the power plant of Haldia was higher as compared to that of MRL because of the higher steam and power consumption resulting from the difference in the processing scheme, the additional cost being of the order of Rs. 50 lakhs;

(v) In the case of Haldia Refinery, provision was made for storage tanks for loading of products into rail wagons. In the case of MRL, this facility was provided by the Marketing Division; additional cost is around Rs. 1.73 crores.

(c) *Extra cost due to pecular location of Haldia extra civil work, peculiar soil conditions etc. Rs. 309 crores.*

Haldia Refinery was located in a comparatively under developed area and the seismic soil conditions entail extra expenditure.

(d) *Provision of marketing facilities and port facilities Rs. 26.9. crores.*

Unlike the Madras Refinery which had the benefit of utilising the facilities available at Madras for the Marketing Division and at the port, it was necessary to provide at Haldia some of the facilities afresh.

(e) *Township—Rs. 1.51 crores.*

The total provision on account of township in the case of Haldia Refinery staff worked out to Rs. 2 crores as against the corresponding figures of Rs. 50 lakhs approximately in the case of MRL as almost all the employees of the latter lived on their own in Madras.

3.20. The Committee pointed out that the revised estimates of September, 1970 were based on the construction schedule then available viz. completion of the main refinery by September, 1972 and lube oil units by October, 1972. They enquired whether the estimates were likely to be further revised on account of the delay in commissioning of the refinery. The Ministry replied in the affirmative, and added that the extent of the revision could be worked out only after the completion of the Project.

3.21. The Committee enquired as to why no Project Report was prepared for Haldia Refinery. In a written reply the Ministry stated as follows:—

> "Based on the projected demand for petroleum products, decision was taken in principle in 1964 to set up two refineries with a capacity of 2.5 million tonnes each—one at Madras and the other at Haldia. Establishment of Madras Refinery was taken up first and discussions were held with foreign parties for the setting up of a refinery in the Haldia region. When negotiations with the foreign parties reached a concrete shape, a decision was taken in August, 1967 regarding the setting up of refinery at Haldia with collaboration from French and Rumanian parties. The detailed cost estimates for the project was to be prepared only after receipt of further cost details from French. Rumainian and Indian agencies who were to carry out design and engineering jobs which were being further examined and finalised. In refinery Projects it would be possible to prepare detailed cost estimates only after the design and engineering were completed. IOC prepared the detailed cost estimates in December, 1969 and these estimates were examined by Government and Government approval to the revised cost estimates amounting to Rs. 67.50 crores was given in July, 1972."

3.22. During evidence, the Committee enquired as to how the financial viability of the project was determined and on what basis the financial commitments were made without the project report. The representative of the Ministry stated as follows:—

> "I agree that a project of this magnitude should have been sanctioned after some kind of study of feasibility, though a preliminary feasibility report was available to the Government, but Government was anxious to set up the Refineries. The only reason can be that Government was anxious to expand refining capacity as early as possible, since there was a project, of which the profitability, had been gone into in great details. It was taken as the guide for this project and in principle, the project upto the extent of Rs. 46 crores was sanctioned; but detailed estimates and detailed project reports were worked out later on by the IOC, and they were sanctioned subsequently by the Government."

3.23. As regards the delay of two years in sanctioning the revised estimates, the representative of the Ministry stated that there were discussions between the Ministry of Finance, Bureau of Public Enterprises and the matter was referred back and forth to the IOC. After consideration by its Board and also by two Technical Committees the revised estimate was sanctioned. The Secretary of the Ministry stated "it did take longer time, in my opinion, than it should have, before the project could be sanctioned."

3.24. The Committee take a serious view of the fact that Government proceeded with the setting up of the Haldia Refinery without preparation of a Project Report and without a precise idea as to what the project would ultimately cost. The Committee fail to understand as to how Government could assume that the cost of Haldia Refinery would only vary to the extent of 5 per cent from the cost of Madras Refinery when the two projects were based on different collaboration and situated in different locations. The Committee find that Government authorised the Company (in 1969) to sanction individual works within an overall limit of Rs. 46 crores. It was only in January, 1970 the Corporation prepared detailed estimates of cost for Rs. 71.44 crores. These estimates were however, revised to Rs. 67.51 crores, and sent to Government in September, 1970. The Committee find that Government approved the Project Cost estimates of Rs. 67.50 crores only in July, 1972 i.e. after a lapse of about two years. The Committee strongly deplore the delay in processing the revised estimates and according sanction.

3.25. The Committee also view with concern that the Corporation was allowed to proceed with the work and incur expenditure thereon without the financial commitments having been properly sanctioned and approved. The Committee fail to understand as to how in the absence of a detailed estimate of cost, effective control and check of expenditure on the project could be exercised. The Committee were informed that even now the revised estimates as approved by Government are not final and the project cost would go up due to delay in the commissioning of the Refinery, and the extent of revision would be worked out only after the completion of the project. The Committee need hardly stress that revised estimates of the project should not be treated as a mere completion report but should serve as an instrument of financial control. The Committee, therefore, recommend that the Corporation/Government should finalise the revised estimate of the project without any further delay.

3.26. **The Committee stress that the implications of the increased capital investment on the economics of the Project should be critically gone into and brought to the notice of Parliament as recommended by the Committee in paragraph 2.20 of their Thirty-Ninth Report (Fifth Lok Sabha).**

C. Delay in Construction

3.27. The construction of the refinery at Haldia with an annual processing capacity of 2.5 million tonnes was entrusted to the Indian Oil Corporation on 18th September, 1967. As per the original time schedule prepared in August, 1967 the main refinery was expected to be completed by second half of 1970 and the Lube Oil Units by early 1971. According to the revised construction schedule prepared on 4th June, 1969, the mechanical completion and pre-commissioning tests of the main refinery were envisaged to be over by 30th June, 1972 while the Lube Oil Units were likely to be commissioned in October, 1972. On 4th February, 1970 the date of completion of the main refinery was further revised to September, 1972.

3.28. In a written reply the Management informed the Committee (August, 1973) that, "the fuel sector of Haldia Refinery was expected to be completed by 1st quarter of 1973 according to schedule prepared in March, 1971. It is now expected that the fuel sector of the refinery will be commissioned during the first quarter of 1974 and the lube sector by the end of 1974."

3.29. During evidence, the Additional Secretary of the Ministry, however, informed the Committee as follows:—

> "All projection of its completion have gone wrong. I am sorry to say this. The present indications are that the refinery part of it *i.e.* fuel part of it will be completely by the middle of 1974 and the lube part of it by the end of 1974."

3.30. The main factors which contributed to the delay in the construction of Haldia Refinery were stated to be as follows:—

Main Refinery

(a) Delay in the technical studies by the collaborators.

(b) Delay in deciding the lists of equipment to be imported and to be procured indigenously.

(c) Delay in the settlement of price for the equipment to be supplied by the French suppliers and also delay in negotiating the price with Indian vendors for indigenous equipment.

(d) Delay in the preparation of tender documents and tender action.

(e) Labour difficulties in West Bengal.

Lube Oil Units

(a) Delay in the work studies by the collaborators.

(b) Delay in deciding the division list of equipment to be imported and to be procured within the country.

(c) Time consumed in tying up the foreign supplies with the time of credit.

3.31. The other factors which contributed to the delay were stated to be as follows:—

(a) The project envisaged fullfledged active partnership of an Indian party in the design and construction of the project with a view to develop indigenous know-how.

(b) Care taken in scrutinising the major and minor items of equipment and materials to ensure maximum procurement and/or their fabrication in India instead of importing, with a view to develop indigenous industries.

(c) Location of the refinery in an undeveloped area with a view to industrialise it.

3.32. During evidence the Managing Director, IOC (Refineries Division) informed the Committee that the major reasons for delay in the construction of Haldia Refinery were as follows:—

"1. There are various agencies involved in designing engineering and procurement in the construction of this refinery at 3 different places—France, Rumania and India and this took a very long time.

2. In this refinery we wanted to maximise indigenous equipment and machinery as also to utilise the maximum know-how. In order to do that *i.e.* to get the maximum from the country, we found that our indigenous manufacturers could not produce machinery in time and there has been quite a lot of delay to get the equipment from indigenous suppliers.

3. The foreign exchange has been financed from various credits of countries like France, Italy and U.K. To get the material through these we had to go through various formalities and until all the formalities were completed, they did not want to take the job of design etc.

4. We are facing lot of difficulty due to labour problem."

3.33. The Committee pointed out that there was lot of delay in designing. They enquired whether this was due to dependence on foreigners. The Managing Director stated that "there are two parties involved—one is France and other is Rumaniaa. Certain Units were designed at France and certain in Rumania and certain in India. The coordination job actually is the responsibility of IOC. Because of three places, design and engineering was done at three places. There was a considerable delay in getting all the data for engineering."

3.34. The Committee enquired whether there was any particular advantage in having contracts with different countries. The Chairman, IOC stated as follows:—

> "This was to procure the equipment through the agencies of Government aided loans which were available, otherwise it would have been necessary for us to go in for free foreign exchange which has always been a problem. So, in assessing the total requirements and finding out what would be the most feasible and convenient way of doing it, it was found at that time that equipment from France was available which could be obtained from French loans. Similarly, equipment from Rumania was available which could be obtained from rupee loan and we paid them back in rupee."

3.35. About the labour problem it was stated that efforts had been made continuously at all levels to tackle the problem but the improvements in the situation were only temporary. IOC and the Ministry had been in continuous touch with the Government of West Bengal regarding improvement in the labour and law and order situation at Haldia.

3.36. As regards delay in the receipt of indigenous equipment and materials it was stated that the reasons generally given by the vendors for non-adherence to the delivery schedule had been scarcity of raw materials, labour problems, power cuts, etc. The Project authorities as well as Engineers India Limited had been regularly chasing the vendors by personal visits to their factories for stepping up the supplies.

3.37. The Committee enquired as to how far the delay was avoidable and whether any analysis of the actual delay in the construction of the Refinery had been made to find out the extent to which it was attributable to each of these factors. In a written reply the Ministry stated that, "it is difficult to evaluate the delays itemwise and identify which are the delays which were within the control of the Management and which were outside because the project construction schedule depend on many factors which are inter linked."

3.38. The Committee find that as per the original time schedule proposed in August, 1967 the main Refinery was expected to be completed by the second half of 1970 and the Lube Oil Units by early 1971. The construction schedules have been revised several times. It is now expected that the fuel part of the Refinery would be completed by the middle of 1974 and the lube part of it by the end of 1974. The Committee regret to note that the construction of the Haldia Refinery has been delayed by about 4 years.

3.39. The Committee would like Government to thoroughly investigate the matter so as to identify the factors which continue to impede

the completion of the Project so that the latest estimates for commissioning of the Refinery are adhered to.

3.40. The Committee need hardly stress that any further delay in the construction and commissioning of the Refinery would only accentuate the oil crisis in the country.

IV

REFINERY CAPACITY IN THE COUNTRY

A. Expansion of Refining capacity during the Fourth Five Year Plan

4.1. In 1968, the year before the beginning of the Fourth Plan, there were 8 refineries in operation with a total capacity of 16.25 million tonnes per year in terms of crude through put as indicated below:—

	In million tonnes
A. *Public Sector*	
1. Gauhati .	0·75
2. Barauni .	2·00
3. Koyali .	3·00
4. Cochin	2·50
TOTAL 'A' .	8·25
B. *Private Sector*	
1. Digboi	0·50
2. Burmah Shell	3·75
3. Esso	2·50
4. Caltex .	1·25
TOTAL 'B'	8·00
GRAND TOTAL A & B	16·25

4.2. The Fourth Plan envisaged addition to the refining capacity to the extent of 9.3 million tonnes during the Plan period, to raise the capacity to 25.55 million tonnes per annum by the end of the Fourth Five Year Plan. This was to be achieved by setting up new refineries and expansion of existing ones as under:—

	Million tonnes per annum	
(*i*) Madras Refinery .	2·5	1969
(*ii*) Haldia Refinery . .	2·5	1972 end
(*iii*) Additional capacity in Assam .	1·0	No firm time schedule fixed.
(*iv*) Expansion of Cochin Refinery	0·80	1972
(*v*) Expansion of Koyali Refinery . .	1.50	Contingent upon crude availability
(*vi*) Increase in utilisation of capacity of Barauni Refinery . .	1.0	
	9.30	

4.3. Madras Refinery which was a spill-over project from the Third Five Year Plan was on stream in 1969.

4.4. Haldia Refinery which was expected to go on stream by the end of 1972 is now expected to be completed by the end of 1974.

4.5. Additional refinery capacity in Assam was originally sought to be achieved by expansion of Gauhati Refinery. It was subsequently decided to have a new refinery along with a petrochemical complex at Bongaigaon. The scheme was approved in March, 1972 and the refinery is expected to be completed in 1976.

4.6. It has been stated that "the utilisation of the idle capacity in Barauni Refinery and the utilisation of additional refining capacity in Assam are linked together and delays are on account of delays in coming to a final decision in the implementation of the Government's decision regarding the additional capacity in Assam". The full capacity of the Barauni Refinery cannot be utilised until the building of the additional processing units now in progress are completed. As an interim measure with some minor modifications the refinery is now processing 0.5 to 0.7 million tonnes per annum of imported crude.

4.7. Firm decision regarding expansion of Cochin refinery was taken at the time of the Fourth Plan was finalised. Sanction for the expansion of the capacity at an estimated cost of Rs. 5.12 crores was issued in November, 1970. The Project was expected to be completed by the end of 1972. It was, however, actually completed by August, 1973.

4.8. The expansion of the Koyali Refinery was on the basis of additional crude expected to be available from the Gujarat fields. This did not materialise to the extent expected and, therefore, the Refinery instead of building an additional distillation unit to process 1.5 million tonnes of crude revised the plans and de-bottlenecked/revamped the plant and increased the capacity to 4.3 million tonnes. Even this capacity is today not being fully utilised because of crude oil production from Gujarat not coming up to expectations. The existing utilisation of capacity is 3.8 million tonnes per annum. It has been stated that ONGC expects to step up supplies to the level of 4.3 million tonnes by 1974-75.

4.9. The statement given below indicates the refinery capacity (in terms of crude run) planned and achieved 1969—72:

1968 End of 3rd Plan (existing capacity)	1969		1970		1971		1972		1973	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual*
				Public Sector						
Gauhati	0·75	0·75	0·78	0·75	0·70	0·75	0·76	0·75	0·82	0·82	0·77
Barauni	2·00	2·00	2·05	2·20	2·20	2·20	2·24	2·40	2·29	2·90	2·64
Koyali	3·00	3·40	3·35	3·60	3·44	3·60	3·62	3·80	3·73	3·80	3·58
Haldia	..	..	..	..	..	..	..	..	..	..	..
Cochin	2·50	2·50	2·47	2·50	2·59	2·50	2·44	2·50	2·35	2·77	1·97
Madras	..	1·25	0·87	2·50	2·06	2·60	2·14	2·50	2·65	2·73	2·51
TOTAL	8·25	9·90	9·52	11·55	10·99	11·65	11·20	11·95	11·84	13·02	11·47
				Private Sector						
Digboi	0·50	0·50	0·52	0·50	0·49	0·50	0·47	0·50	0·53	0·53	0·53
Burmah Shell	3·75	3·75	3·71	3·75	3·45	3·75	3·90	3·75	3·64	3·75	4·48
Esso	2·50	2·50	2·44	2·75	2·35	2·75	2·77	2·75	3·52	2·75	2·91
Caltex	1·25	1·25	1·31	1·25	1·18	1·25	1·25	1·25	1·15	1·25	1·11
TOTAL	8·00	8·00	7·98	8·25	7·47	8·25	8·39	8·25	7·84	8·28	9·03@
	16·25	17·90	17·50	19·80	18·46	19·90	19·59	20·20	19·68	21·30	20·50

*Provisional

@This includes 1117 thousand tonnes of crude supplied by IOC to three coastal refineries for processing on process margin basis.

4.10. The Ministry stated in a written note that the main reasons for the gap in the refining capacity envisaged and the actual refining capacity available during these years were limitations of availability of indigenous crude, inadequacy of port facilities at Madras and Slippage in the programmes for erection of additional capacity.

4.11. By the end of the Fourth Five Year Plan, a refining capacity of 13.25 million tonnes as against 17.55 million tonnes is expected to be achieved in the public sector refineries as detailed below:—

	Million tonnes per annum
A. *Public Sector*	
1. Madras Refinery .	2·50
2. Cochin Refinery .	3·30
3. Gauhati Refinery	0·80
4. Barauni Refinery .	2·80
5. Koyali Refinery	3·80
	13·25

4.12. The Committee note that the Fourth Five Year Plan envisaged an increase in the Refining capacity in the public sector from 8.25 million tonnes to 17.55 million tonnes per annum. They, however, find that for one reason or other none of the schemes envisaged in the Fourth Five Year Plan could be fully implemented, with the result that the refining capacity likely to be available by the end of the Fourth Plan would be only 13.25 million tonnes per annum. The Committee have already recommended elsewhere in this Report that the delays in commissioning of the Haldia and Bongaigaon Refineries and the under-utilisation of Barauni Refinery should be investigated by Government. The Committee hope that Government/Corporation would profit from their past experience and have an integrated approach in drawing up schemes for expansion of refining capacity in the Fifth Five Year Plan keeping in view the availability of indigenous and imported crude.

B. Expansion of Refining Capacity in the Private Sector

4.13. The question of expansion of refining capacity in the private sector was examined by the Estimates Committee (1967-68) in their Fiftieth Report (Fourth Lok Sabha) on 'Petroleum and Chemicals Products'. The

original and the then existing capacity of the three coastal refineries in the private sector as mentioned in that report was as follows:—

(Million tonnes)

	As per Co's. first letter	Capacity in 1967
1. Burmah Shell Refinery, Bombay	1·50	3·75
2. ESSO Refinery, Bombay	0·92	2·50
3. Caltex Refinery, Vishakhapatnam	0·50	1·55
	2·92	7·80

4.14. The Estimates Committee thus noted that the rated capacity in the three refineries had been increased by more than 2½ times over the years. They expressed their concern that the expansion of the refineries in the private sector had been carried out without the approval of Government in as much as Government's permission had not been sought for capital investment for this purpose. The Committee expressed their doubt that the capacity of the refineries could be increased to about two times with minor modifications and improvements unless the additional capacity was contemplated and built into the original plant and equipment itself. The Committee concluded that Government had not taken sufficient care in the beginning to check over designing of capacities of refineries in the private sector. The Committee recommended that Government should immediately evolve a suitablle machinery to ensure that no industrial unit was able to increase its licenced capacity in that manner without prior approval of the Government.

4.15. In their reply dated the 20th April, 1969 Ministry of Petroleum and Chemicals noted the recommendation and assured that steps would be taken in future to ensure that capacities approved were not exceeded. It was also added that "the Industries (Development and Regulation) Act, 1951 (Act No. 65 of 1951) contained provisions conferring on Governmental authorities the power to inspect the premises, order the production of documents and examine any person having the control of, or employed in connection with any industrial undertaking. This inspection, in respect of refineries, could be undertaken either by officer of DGTD and/or Technical officers employed in the Indian Institute of Petroleum or IOC whenever deemed desirable."

4.16. The Committee have now been informed that the position with regard to the licensed capacity sanctioned by Government to Burmah Shell,

Esso and Caltex, the foreign oil companies operating in the private sector was as under:—

Company	Original Licensed Capacity/ Date of Sanction	Revised Capacity and date of sanction
1. Burmah Shell .	2·00 Million Tonnes per annum dated 3-5-1954.	
2. Esso .	1·21 Million Tonnes per annum dated 24-6-53.	1·9 Million Tonnes on 2-5-61 Addl. (Approx.) 0·25 Million Tonnes from 1969.
3. Caltex .	0·675 Million Tonnes per annum dated 28-9-55.	

4.17. In the latter part of 1972, the refineries claimed that they could operate at the levels mentioned below:—

Burmah Shell . . .	5·25	million tonne per annum.
Esso .	3·50	Do.
Caltex .	1·55	Do.
	10·30	

4.18. It is seen that in respect of Burmah Shell the extra capacity is 1.5 million tonnes per annum (5.25-3.75). In respect of Esso, an additional crude run of 0.25 million tonnes was given in 1969 as per the Lube Refinery Agreement (Lube India Ltd.). There is thus an increase of 0.75 million tonnes from 2.75 to 3.5. In respect of Caltex the level was the same as indicated in 1967 *viz.*, 1.55. The operating capacity of Caltex during the year 1969—72 was, however, 1.25.

4.19. It was stated that the extra capacity of 2.55 million tonnes per annum over and above the normal operating levels had been utilised by Government for processing crude oil supplied by the IOC, the products also being taken over by IOC for marketing. The processing of IOC's crude in the private sector refineries started in June, 1973.

4.20. During evidence, Committee enquired whether the imported crude oil was being given to private sector refineries for processing because the expansion/utilisation of capacity of the public sector refineries had been very much delayed. The Additional Secretary of the Ministry stated as follows—

> "We have some surplus capacity at Kovali, for want of a pipeline that surplus capacity could not be put to use. We have some

capacity at Barauni. But secondary processing facilities are not available. To the extent to which crude could be processed, about 0.5 to 0.7 million tonnes imported crude is being processed at Barauni. Haldia is just not ready. Other refineries at Madras and Cochin are running to capacity." He added.

"If the Haldia Refinery had been ready in time as scheduled, we would have had the capacity of 2.5 million tonnes. If Koyali had their pipeline, certainly we would not have gone to the private companies to refine oil. It is because of these reasons that we had to use the excess capacity available with these companies."

4.21. He added that "now plans are in hand for setting up the pipeline upto Koyali, and also the pipeline extension will be done upto Barauni. Steps are being taken to put up secondary processing plant.

4.22. With regard to the sanctioning of capacities in the private sector, the Ministry stated as follows:—

"The exact capacity of these refineries from time to time have not independently been assessed by the Ministry. From time to time, these refineries have been claiming that they can operate at higher levels and these refineries have been allowed to operate at levels higher than their licenced capacities with the specific approval of Government."

4.23. The Committee enquired as to how the large increase in the capacity was achieved by the private sector refineries and whether in the public sector refineries it was possible to increase the refinery capacity to the same extent by carrying out modifications at the same cost as had been done by the private sector refineries. In a written reply, the Ministry have stated as follows:—

"No detailed investigation has been conducted as to how the present capacity has been achieved. However, in the present context of extremely difficult crude oil availability and with a view to utilise the existing capacities to the maximum extent possible, the higher operating levels of these refineries have come in very handy to meet the product requirements of the country.

The capacity of a refinery can be increased substantially by technological innovations and also by introducing additional equipments This is specially true of the refineries built in 1950's or earlier when rather more conservative design philosophies were used. In the modern refineries which are designed on more precise data with the help of computers, the scope for increasing the capacity many-fold by debottlenecking etc. is limited.

In the case of the private sector refineries, it must have been possible for them to increase the capacity considerably by modifying the trays in the distillation column and using modern trays, adding additional furnace tubes and also accepting less accuracy in splitting the various fractions etc. The private sector refineries might have also built the capacity by using equipment from processing units which were built earlier but later discarded and installed new machineries under replacement and modernisation schemes. It is not possible to know for certain as to how the large increase in the capacity was achieved by them, but possibly they might have used all the above mentioned means.

Increase in capacity have been achieved in the public sector also. For example, the Koyali Refinery has increased its capacity from 3 to 4.3 million tonnes by debottlenecking, changing operating conditions etc. This works out to about 48 per cent. The Udex Plant of Koyali Refinery has raised its capacity to produce benzene from 33,000 tonnes to about 43,000 to 45,000 tonnes per year by spending less than Rs. 1.50 lakhs for minor modification. In the Cochin Refinery the capacity has been increased from 2.5 million tonnes to 3.30 million tonnes by spending about Rs. 5½ crores. This works out to about 32 per cent. The Madras Refinery has increased its capacity from 2.5 million tonnes to 2.8 million tonnes per year (12 per cent increase) with very minor changes and are now planning to increase the capacity still further to 3.5 million tonnes."

4.24. The Committee find that the private sector refineries have increased their capacity form 8.25 million tonnes per annum to 10.30 million tonnes per annum. The Committee were informed that this increased capacity is being utilised for getting the crude oil supplied by IOC processed and the products taken over by IOC for marketing. It has been admitted that had the Haldia Refinery been ready as scheduled and the Koyali Refinery had its pipeline, the Indian Oil Corporation would not have gone to the private sector companies for refining their crude.

4.25. The Estimates Committee (1967-68) in their Fiftieth Report on 'Petroleum and Petroleum Products' had earlier expressed their doubt whether the capacity of these private sector refineries could be increased with minor modifications and improvements unless the additional capacity was contemplated and built into the original plant and equipment itself. They recommended that Government should immediately evolve a suitable machinery to ensure that no industrial unit was able to increase its licensed capacity in that manner without prior approval of the Government. The Committee regret to note that in spite of this recommendation of the

Estimates Committee and inspite of Government's own categorical assurance, the Government have not investigated into the matter. They are surprised to find that refineries have created a further capacity of more than 25 per cent and are operating at levels higher than those licensed for. The Committee recommend that the Government should make a detailed and thorough investigation without any further delay.

4.26. The Committee note that Government claim that they have been able to increase the refining capacity of the existing refineries by debottlenecking, changing operating conditions etc. in the Koyali, Cochin and Madras Refineries. The Committee, however, find that the percentage of increase achieved in those refineries is much less compared to the increase in the capacity achieved by the private refineries. The Committee recommend that Government|Corporation should give the highest priority to this aspect of increasing the refining capacities in the public sector refineries by revamping and debottlenecking etc. so as to achieve maximum results.

V

GAUHATI REFINERY

A. Acquisition and Development of land for the Refinery

5.1. In 1956, the Government of Assam assured the Refinery Location Committee that 600 acres of land, fully developed, would be made available free of cost for the refinery. On 2nd May, 1958, this assurance was re-iterated but on 27th April, 1959, a request was made to the Government of India that the State Government be allowed to have financial participation in the refinery to the extent of the actual expenditure incurred on the acquisition of land. The request was accepted by the Government of India on 12th November, 1959. It was decided on 16th July, 1962 that the financial participation should be limited to 15 per cent. of the equity capital investment in the refinery and that the first issue of shares be adjusted towards the cost of land; the balance, if any, was to be subscribed in cash.

5.2. The total area acquired by the State Government at a cost of Rs. 46.93 lakhs and handed over to the refinery during 10th December, 1959 and 5th February, 1964 was 480.22 acres. The deed of conveyance for land has not been executed so far nor have the shares in lieu thereof been allotted.

5.3. According to the assurance given in 1956 the cost of Development of land was to be borne by the State Government on 1st April, 1960, however, the State Government made a request to the Government of India for the reimbursement of the development expenditure by transfer of shares of the equal value. This was turned down by the Government of India on 9th May, 1960.

5.4. The Company has incurred upto 31st March, 1973 an expenditure of Rs. 104.25 lakhs on the development of land, township roads and drains, etc. but has not been able to obtain reimbursement thereof from the State Government so far.

5.5. The Ministry stated (in March, 1972) that a fresh representation received (in September, 1971 from the State Government for including not only the cost of acquisition of land but also the development expenditure for the purpose of allotting the shares and for the removal of the ceiling of 15 per cent with regard to financial participation in the equity capital has been considered and it has been found that it is not possible to accede to the same. It was further stated that the State Government had been "asked to reimburse to IOC the expenditure on development of land incurred by them and to indicate the final figures of the cost of acquisition of land so that necessary shares may be allotted to them."

5.6. In a written reply the Managment have now stated as follows:—

> "The matter regarding participation by the State Government has not yet been finally settled. It is, however, understood that the Government of India, Ministry of Finance have recently taken a view that IOC should bear in full the cost of acquisition of the land as well as the development of land and no equity need be issued to the State Government. This view will be discussed further with the State Government of Assam."

5.7. During evidence the Financial Adviser of the Ministry further explained the position as follows:—

> "The question of provision of land and facilities free of cost or at concessional rates by the State Governments for Central projects was very carefully considered in July, 1969 both in the Planning Commission and in the Finance Ministry. The decision taken was that the Central Ministries should desist from appproaching the State Governments for provision of land and services free of cost or at concessional rates for central projects."

5.8. Asked about the reasons for delay of 14 years in arriving at a final settlement, it was stated that the delay arose because of a number of factors. In the first place, the question whether it should be the cost of land or cost of levelopment also, was in dispute. Secondly, there was the question whether the title to the land should be transferred and all formalities had to be gone through. There was also a controversy about the equity participation which was at first fixed at 12½ per cent but was later on increased to 15 per cent on the anology of Gujarat Government's participation in the Koyali Refinery.

5.9. It was also stated that after the decision of the Ministry of Finance was conveyed to IOC in February, 1973 the Assam Government had been invited to a discussion. There had however been no response from them as yet.

5.10. The Committee pointed out that the period of 14 years was long enough time. The witness said 'we certainly plead guilty to this."

5.11. The Committee are surprised to note that though the area of 480.22 acres had been acquired by State Government of Assam and handed over to the Refinery during December, 1959 and February, 1964, the deed of conveyance for land has not been executed so far. Earlier in November, 1959, it was decided that the State Government of Assam would be allowed to have financial participation in the Refinery to the extent of the actual expenditure on the acquisition of land. In July, 1962, it was decided that the financial participation should be limited to 15 per cent of the equity capital investment in the refinery and the first

issue of shares should be adjusted towards the cost of land and balance subscribed in cash. However, in July, 1969 Government, took the decision that the Central Ministries should desist from approaching the State Governments for provision of land and services free of cost or at concessional rates for Central Projects. The Committee regret to note that there has been an inordinate delay of over 14 years even in clinching the issues for settlement and even now the State Government have not paid the cost of development of land. The Committee recommend that Government should take more serious measures and settle the issues with the State Government without any further delay.

B. Agreement with Foreign Collaborators

5.12. According to the agreement with the foreign collaborators, the refinery was to be commissioned within 24 months from the date of acceptance of the technical design and the rated capacity was to be achieved within a period of 5 months from the date of commissioning. The design was accepted on 23rd October, 1959, and the refinery should have gone into production by October, 1961. The table below indicates the delay in the commissioning of the various units of the refinery:—

Unit	Actual date of commissioning	Delay
Crude Distillation Unit .	December, 1961	2 months
Kerosene Refining Unit .	April, 1962	6 months
Coke Oven Unit .	April, 1962	6 months

5.13. The Management have attributed the delay to:—

(i) shortage of certain materials of foreign supply such as G.I. pipes, metal clading, etc. which had to be made up from the indigenous sources;

(ii) delay in the receipt of certain foreign equipment viz. pumps for reduced crude circulation and for coke cutting; and

(iii) delay on the part of civil contractors.

5.14. Owing to delay in the commissioning of the refinery, the foreign technicians had to stay for longer periods (1,454 man-months) than originally anticipated (972 man-months), with the result that the cost of technical assistance rose from Rs. 28,57,100 to Rs. 39,20,852. Out of 482 additional man-months, 170 man-months were attributed by the Management to frequent shut-downs in Kerosene Unit during the guarantee period and delay in the receipt of certain accessories. A claim for reimbursement of extra expenditure of Rs. 7,20,430, incurred on the overstay of Romanian

Technicians due to delay in commissioning and mal-functioning of the Kerosene and Coking Units was lodged for the first time with the collaborators M/s. Industrial Export as early as in February, 1963. After exchange of a number of letters and discussions held in August, 1964, M/s. Industrial Export had agreed to bear the cost of overstay of technicians due to troubles in the Kerosene Unit. The suppliers also agreed to consider the claim for a period of two months in respect of Coking Unit.

5.15. On 1st November, 1966, the Company brought the matter to the notice of the Government of India. The claim, which has since been revised to Rs. 6,99,845 on account of recalculation of the excess man-months of Rumanian technicians, has not been settled so far.

5.16. During evidence the Committee enquired as to how Government had not been able to settle the issue even after seven years. The Additional Secretary of the Ministry stated as follows:—

> "This is another case of delay which is inordinate and, we straightway admit, is not justified. The matter was raised in 1967. It was taken up with Rumanian authorities and with our Minister of External Affairs. Our Ambassador discussed this, IOC was then asked to negotiate further. IOC consulted and then informed the Embassy saying that the Embassy could negotiate. This is a matter which seems to have been badly delayed. I think Rumanian authorities have not been responding and we have now asked for a discussion. This is now fixed by our Ambassador on 10th of November, 1973 at Bucharest when this matter is likely to be settled. I don't have any sort of valid explanation for the delay. This is going on for the last so many years. The foreign part which assisted us in putting up this refinery is concerned in the matter. We have also got to follow international practices, going through External Affairs, and the Embassy, etc. sending them aide, memories and requesting for their concurrence."

5.17. In a written reply it was subsequently stated that "the Administration Manager, IOC had recently held discussion with M/s. Petrom of Rumanian. M/s. Petrom have agreed to place the matter before their Board of Directors. They have promised to send a reply by the end of February, 1974.

5.18. The Committee note that though according to agreement with foreign collaborators, the Refinery was to be commissioned by October, 1961, there had been delays ranging from two to six months in the actual completion of various units resulting in overstay of the foreign technicians. Consequently, there had been an increase in the cost of technical assistance from Rs. 28.57 lakhs to Rs. 39.21 lakhs. The Committee regret to note that there had been a delay of over ten months in preferring the claim for

reimbursement of extra expenses and the first claim to the tune of Rs. 7 lakhs was preferred only in February, 1963. The Committee were informed that even after protracted correspondence and discussions, an agreement was reached with the collaborators only in August, 1964. The Committee find that after this agreement the Corporation had taken further period of two years to revise their claim and prefer it.

5.19. The Committee view with concern the inordinate delay on the part of the Management both in preferring the claim and subsequently revising it. Even after a lapse of seven years, the claim is stated to be pending decision and settlement. The Committee recommend that the reasons for this inordinate delay at several stages should be investigated and responsibility fixed. The Committee would like that the question of settlement of the revised claim should be vigorously pursued so as not to lose more time.

C. Designed Capacity and Product Mix of the Unit

5.20. The Refinery has three processing units, the Crude Distillation Unit, Kerosene Refining Unit and the Coke Producing Unit. The table below indicates the designed processing capacity of these units, their inputs, outputs and the dates of commissioning:—

Name of the Unit	Date of Commissioning	Designed processing capacity (tonnes)	Input	output
(i) Crude Distillation Unit	26-12-1961	7,50,000	(i) Crude Oil (ii) Slops	(i) S. R. Gaso line (ii) S. R. kerosene-I (iii) S. R. Kerosene-II (iv) Mixed Kerosense (v) S. R. Gas Oil (vi) Reduced Crude (vii) J.P.-4 Component (viii) Gas (ix) Slops
(ii) Kerosene Refining Unit . . .	30-6-1962	2,30,200	(i) S. R. Kerosene-I (ii) S. R. Kerosene-II (iii) Mixed Kerosenes	(ii) Extracte
(iii) Coking Unit	April, 1962	3,00,000	Reduced Crude	(i) Coking Gasoline (ii) Coking Kerosene-I (iii) Coking Kerosene-II (iv) Coking Gas Oil (v) Coking Fuel Oil (vi) Residue (vii) Coke (viii) Gas (ix) Slops

D. Production Performance—Crude Distillation Unit

5.21. The designed capacity of the crude Distillation Unit is 7,50,000 tonnes. According to the Management the Rumanian collaborators have indicated that the refinery can take crude oil upto 8,10,000 tonnes per annum.

5.22. The table below indicates the crude throughput (including slops), percentage of capacity utilisation with reference to design throughput and inbuilt capacity of 8,10,000 tonnes during the last seven years ended March, 1973:—

Year	Throughput including Slops M.T.	Percentage Capacity Utilisation with reference to	
		Design throughput of 7,50,000 M.T	In built capacity of 8,10,000 M.T.
1966-67	762611 (19472)	101·7	94·1
1967-68	832818 (21099)	111·0	102·8
1968-69	820053 (17403)	109·3	101·2
1969-70	784571 (19776)	104·6	96·9
1970-71	695226 (9476)	92·7	85·8
1971-72	807398 (11369)	107·7	99·7
1972-73	806123 (13172)	107·5	99·5

Note :—Figures in bracket relate to Slops processed in the Unit.

5.23. The Management have attributed the following reasons for the decline in the capacity utilisation of the Unit during 1968-69 and 1969-70 as compared with 1967-68:—

1968-69

The Unit had to be operated on restricted throughput for about a month during October/November, 1968 due to heavy floods in Teesta river which damaged Gauhati-Siliguri product pipeline and also restricted the Movement of products by rail/road.

1969-70

Throughput in the Unit was mainly affected due to longer shut down periods of coking unit and consequent critical reduced crude ullage problem at the refinery.

5.24. As regards the decline in the capacity utilisation of the crude Distillation Unit during the years 1970-71 to 1972-73, the Management stated that the capacity utilisation had to be correlated with the crude supply position which was further related to the total availability of crude oil from the Assam Oil fields for Gauhati and Barauni Refineries through the Oil India Pipeline. Barauni Refinery was not in a position to take the full quota of 2.2 mmt. during the year 1967-68 and as much more crude could be released to Gauhati Refinery. From the year 1970-71 Barauni Refinery started taking almost its full quota and as such availability for Gauhati was restricted to the order of 0.8 million tonnes from 1971-72 after Oil India had changed the plungers in their Moran Pumping Station. During 1970-71, the supply rate to Gauhati and Barauni Refineries was less than 3 mmt. per annum because of the limitations of plungers capacity at their Moran Pumping Station as well as of their Crude Conditioning Plant. They could, however, supply only at the rate of about 2.896 mmt. per annum during the winter months.

5.25. The following additional reasons were given for the decline in capacity utilisation in 1970-71.

(i) Unsteady and interrupted power supply from ASEB when turbo generators were under capital maintenance one by one from April, 1970 to December, 1970.

(ii) During July and August, 1970, there was product upliftment difficulty at Siliguri due to railway strike resulting in ullage problem at the refinery.

5.26. Regarding the shortfall during 1971-72 and 1972-73, the Management stated that as compared to the crude availability the shortfall was negligible and was due to the following reasons:—

(i) Poor upliftment of products from Siliguri during August and September, 1971, as a result of snapping of broad-gauge railway link across Farakka because of floods.

(ii) Extended/emergency shut down of coking unit in May—July, 1972 and February, 1973 causing ullage problem for reduced crude. Consequently the Distillation Unit had to be run on restricted throughput.

(iii) During the early part of the year 1972-73 there was a shut down of product-pipeline also due to power failure resulting in ullage problem of finished products.

5.27. With regard to the supply of power from the Assam State Electricity Board and the capital maintenance of generators the management stated as follows:—

"For capital maintenance what was needed was a proper assessment of materials and spare parts required for the purpose. This

assessment was made by the refinery and action for procurement from the original manufacturers was initiated sometime in 1967 and orders placed on them in February, 1968. The spares were received in Gauhati only in November, 1969 in spite of best efforts to procure the same earlier.

Government of India was approached in December, 1969 for releasing necessary foreign exchange for requisitioning the services of the Rumanian Specialist required for the job. The approval was received in March, 1970 from the Government.

Immediately M/s. Industrial Export were requested to depute the Rumanian Specialist to India. As this specialist was involved in a car accident he could not come as planned.

Another specialist was nominated by M/s. Industrial Export who reached Gauhati only in June, 1970. The major overhaul of the turbine was taken up between June, 1970 and December, 1970. The preliminary action required for major overhaul was however started in April, 1970 itself in anticipation of the arrival of the Rumanian Specialist.

It is just a coincidence that when the Rumanian specialist arrived in India for major overhaul, the water supply position in the reservoir of ASEB power house became inadequate which could not be anticipated and was beyond the control of the refinery authorities."

5.28. During evidence, the Committee enquired, whether the proposal of installation of an additional generator was considered since 1967 in view of the expected capital maintenance of turbo-generator. The Managing Director stated as follows:—

"In 1967, there was a proposal to go in for another turbine. We had then two turbines and the proposal was to have one more turbine. At that time there was another proposal to expand the refinery but ultimately expansion of the Gauhati Refinery was abandoned because another refinery at Bangaigaon was coming up. So we did not take action for procuring another turbine. But what we did was that we have arranged with the ASEB that if one power unit is out of order, it will take power

from the other unit. Similar agreement has also been entered into with other State Electricity Boards."

5.29. The Managing Director added that this had not been working satisfactorily as when the turbine was down they had not enough hydro-electric power and their distribution system was not good, though the production capacity was 3 megawatt for each turbine of Gauhati Refinery they could produce only 2.5 megawatt each.

5.30. Asked whether the management did not expect any trouble in future, it was stated as follows:—

"Now, we do maintenance of our turbines in time and we have also got the spare parts. Also the Assam Electricity Board have improved their system. We hope that this kind of problem will not arise in future. Another power station is coming up near this refinery. It is the Chandrapur Power Station which will be under the control of the ASEB. When this power station comes up, we hope that there will be a more stable power supply from the ASEB."

5.31. The Committee note that lower supply of crude oil, unsteady and interrupted power supply from the Assam State Electricity Board, delay in the overhaul of the Refinery's generators, product upliftment difficulty at Siliguri and shut downs of Coking Unit causing ullage problem for reduced crude and shut down of product pipeline have been the main reasons for the shortfall in the utilisation of capacity of the Crude Distillation Unit. The Committee recommend that Government/Corporation should analyse these causes in detail in order to find out as to what extent these problems were avoidable in nature. The Committee have no doubt that had there been a proper scheduling for overhaul and advance planning many of the difficulties could have been avoided and shut downs of the Coking Unit and product pipeline could have been reduced to the minimum. The Committee find that the crude throughput including slops and capacity utilisation were the highest during 1967-68. The Committee hope that in the light of the past experience, Government/Corporation would take appropriate steps to secure an uninterrupted supply of power either through the ASEB or by suitable alternate arrangements. The Committee need hardly stress that in view of the tight position of imported crude, Government should take concerted measures to sustain this high throughput and ensure maximum utilisation of the Gauhati Refinery which is processing indigenous crude.

E. Production Performance-Kerosene Refining Unit

5.32. The table below indicates the designed capacity of the unit and the actual quantity of feed stock processed during 1966-67 to 1972-73 :—

Feed Stock	Designed Capacity	Actual quantity processed						In tonnes
		1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73
S. R. Kerosene-I	230200		11,370	9,336	16,787	31,657	24,358	60328
S. R. Kerosene-II		..	8,796	14,189	13,930	37,934	38,354	62,420
Mixed Kerosene		45,509	52,792	5,490	13,782	..	..	
Off-specification Raffinate			347				..	
		43,509	73,305	29,018	44,499	69,591	62,712	1,22,748
Planned throughput (tonnes)		Not avila-ble	82,296	100,745	48,959	72,168	64,600	1,32,200
Percentage of quantity processed to :			..	..	..	..	..	..
(i) Designed capacity		18·90	31·84	12·61	19·33	30·2	27·2	53.3
(ii) Planned throughput		Not avail-able	89·05	28·80	90·89	96·4	97·1	92·9

5.33. As regards the low utilisation of the Kerosene Refining Unit as compared to the designed capacity, the Management stated that the actual availability of feed stock for processing in Kerosene Refining Unit was considerably lower than envisaged in the design. The lower throughput in the Unit was mainly due to the substantial change in the quality of crude resulting in lower percentage of kerosene production than that assumed at the time of designing the plant. Secondly the coker kerosene which was supposed to be processed in the Unit was not available as it had to be blended to make other products like HSD, LDO and Fuel Oil to the specifications.

5.34. As a result of these factors, the actual availability of feel stock was of the order of 50 per cent to 55 per cent of the design level. Further, some of the kerosenes were used for production of Inferior Kerosene by Direct blending of straight run kerosenes instead of the designed scheme of producing inferior kerosene by processing feed stock through kerosene Refining Unit and as a result, the feed stock availability for processing in the Kerosene Refining Unit further reduced to about 30 to 35 per cent of the designed capacity.

5.35. The Management have given the following reasons for lower utilisation during the years when processing was less than 30 per cent.

1966-67

The problem of disposal of Iomex.

1968-69

Mainly due to the breakdown of the SO^2 compressors.

1969-70

Compressors problem and low SO^2 inventory.

1971-72

Lower SO^2 inventory and non-availability of adequate industrial water due to damage to the water intake barage.

Lack of Demand for Lomex

5.36. The difficulties in operating the unit at rated capacity upto 1965-66 were considered by the Committee on Public Undertakings in paras 51—59 of their Thirty-Sixth Report (Third Lok Sabha March, 1967). The lack of demand in the Eastern region for lomex which is produced alongwith the superior kerosene was mainly responsible for non-operation of the unit at full capacity. The Committee were informed by Government (September, 1967) that the matter regarding the alternative uses of lomex which was under study by the Indian Institute of Petroleum, Dehradun was being pursued with them. The Committee were also informed that the technical feasibility and connected problems of transhipment, etc, of lomex for blending for the production of LDO the Gujarat Refinery were also being examined.

5.37. The Ministry stated (in March, 1972) that the Iomex produced at Gauhati refinery was not found suitable for production of LDO at Gujarat Refinery; its production at Gauhati Refinery itself had since been reduced through operational improvements and its disposal was no longer a problem. The production of Iomex had been reduced because of change in operations according to which it was possible to obtain heavy extract at suitable flash point which could be blended in LDO and FO. As a result, it became possible to process S.R. kerosene-II separately and blend Raffinate with S.R. kerosene-I.

5.38. The Committee enquired about the period and the extent to which the working of the kerosene refining unit was affected due to lack of off-take of Iomex. In a written reply, the Ministry stated as follows:—

> "The operation of kerosene Refining Unit was restricted primarily due to limited off-takes of Iomex upto 1966. The Iomex upliftments started improving in 1967-68, and the throughput of Kerosene Refining Unit as a result also significantly improved in this year. However, during the years 1968-69 and 1969-70 Iomex production itself was lower since more feed stocks could not be processed in Kerosene Refining Unit due to equipment and other problems. Iomex yield also declined due to the changes in the specifications of superior kerosene and operational improvements."

5.39. It was also stated that the yield pattern during the years 1968-69 to 1972-73 was as follows against the designed yield of 32 per cent.

1968-69 .	41%
1969-70 .	40·2%
1970-71 .	36·8%
1971-72 .	35·6%
1972-73 .	35·3%

5.40. Asked about the nature of the problems it was stated that the main problems could be classified as follows:—

(i) *Corrosion Problems*

The Management stated that these problems were serious in initial years. Action was taken at that time by way of modifications like provision of knock out drums, changing the metallurgy of some equipment, reducing the moisture content of SO^2 by adjustment of operating conditions. The problem however, again appeared in 1968-69 due to opera-

tion laxity in the control of moisture content of SO_2 as a result of which stringent operational and quality controls have since been enforced to maintain the water content of SO_2 within the required limits.

(ii) *Sulphur Dioxide*

The Kerosene Refining Unit had to be shut down due to low inventory in SO_2 in May, 1968 and this problem was again faced in early 1970 and 1971. This chemical was originally to be supplied by M/s. Associated Industries, Assam with whom IOC had a long term contract. Their plant, however, could function for a short period and had to be shut down in 1964. Due to certain technical problems, the plant would be started only in January, 1970 and again shut down after supply of only about 100 tonnes of SO_2 for Gauhati and Barauni Refineries. In the meantime anoher source of SO_2 was developed and the supplies were procured from Fertilizers and Chemicals Travancore. However, due to long lead and problems in their SO_2 plant there was shortfall in their production levels and the unit remained shut down for about 3 weeks in May, 1968 and could not go in full production till about the middle 1968. The supplies from that source therefore, were short of the requirement for our kerosene Treating Unit at Gauhati and Barauni Refineries.

5.41. It was stated that the Management had taken the following action to augment as well as to ensure the uninterrupted supply of SO_2 •

(i) All possible sources of supply were explored, as a result of which the management was forced to accept small quantities of SO_2 at much higher price from a Bombay party.

(ii) Subsequently, two other suppliers at Bombay were fixed up, as a result of which the position of SO_2 availability and stocks substantially improved.

(iii) Besides whenever the supplies dropped from the expected levels affecting operation, action at the highest level including ministerial intervention was taken to boost up the supply rate but due to the difficulties enumerated above sustained supplies at the desired level was not possible.

(iv) As availability of limited number of cylinders was also partly responsible for unsteady supplies of SO_2 the possibilities of indigenous manufacturers of these cylinders were explored. The only party, who had agreed for the manufacture of this type of cylinders had expressed its inability to manufacture these cylinders after attempting for over three years. Consequently, arrangements to import 41 cylinders from abroad were made.

Variations in the Product Yield

5.42. The table below indicates the yield as envisaged in the Technical Project Report *vis-a-vis* the actual yield thereagainst during the last seven years ended 31st March, 1973:—

(In tonnes)

Input	Quantity	Actual Product	Output Quantity	Output as per DPR	Difference (+) Gain (—) Loss
1	2	3	4	5	6
1966-67					
S.R. Kerosene-I & S.R. Kerosene -II 30%	43,509	Raffinate	23,511	29,194	(—)5,683
		Extract	19,298	13,880	(+)5,418
Mixed Kerosenes (70%)		Loss	700	435	
	43,509		43,509	43,509	
1967-68					
S. R. Kerosene-I	11,370	Raffinate	37,430	49,077	(—)11,647
S. R. Kerosene-II	8,796	Extract	34,451	23,495	(+)10,956
Mixed Kerosenes	52,792	Loss	1,424	733	
Off-specification Raffinate	347				
	73,305		73,305	73,305	
1968-69					
S. R. Kerosene-I	9,336	Raffinate	16,664	19,254	(—)2,590
S. R. Kerosene-II	14,189	Extract	11,883	9,474	(+)2,409
Mixed Kerosenes	5,493	Loss	471	290	
	29,018		29,018	29,018	
1969-70					
S. R. Kerosene-I	16,787	JP-4 Raffinate	1,156		
S. R. Kerosene-II	13,930	ATF Raffinate	4,470	29,709	(—)3,870
		SK Raffinate	20,213		
Mixed Kerosenes	13,782	Extract	17,901	14,345	(+)3,556
		Loss	759	445	
	44,499		44,499	44,499	

1	2	3	4	5	6
1970-71					
S. R. Kerosene-I (45·49%)	31,657	ATF Raffinate	6,886	46,184	(—)3,356
S. R. Kerosene-II	37,934	S. K. Raffinate	35,962		
		Light Extract	9,802	22,711	(+)2,956
		Heavy Extract	16,585		
		Losses	1,096	696	(+) 400
	69,591		69,591	69,591	
1971-72					
S. R.Kerosene-I (38·84%)	24,358	ATF Raffinate	6,417	41,94	(—)2,054
S. R. Kerosene-II (61·16%)	38,354	S. K. Raffinate	33,023		
		Light Extract	5,604	20591	(+)1,777
		Heavy Extract	16,764		
		Losses	904	627	(+) 277
	62,712		62,712	62,712	
1972-73					
S. R. Kerosene-I (99·15%)	60,328	ATF Raffinate	9,149	81,596	(—)4,000
S. R. Kerosene-II (50·85%)	62,420	S. K. Raffinate	68,447		
		Light Extract	14,837	39,925	(+)3,395
		Heavy Extract	28,483		
		Losses	1,832	1,227	(+)605
	1,22,748		1,22,748	1,22,748	

5.43. The production of raffinate was less and of extract more than that anticipated in the Detailed Project Report/Design Manual in each of the seven years. Besides, the loss in these years was 1.6 per cent, 1.9 per cent. 1.6 per cent., 1.7 per cent, 1.57 per cent., 1.44 per cent. and 1.49 per cent respectively as against only 1 per cent. provided for in the Detailed Project Report. These variations in the product yield resulted in loss of revenue to the extent of Rs. 35.57 lakhs.

5.44. The Management explained "that the actual yield of Kerosenes in the Crude Distillation Unit was lower than the design due to the change in crude quality and also the necessity of obtaining suitable SR gas oil cut to meet market specifications of HSD with respect to power point." If the variance is worked out on the basis of recovery of raffinate at 56.5 per cent, as noticed during the course of test run, the revenue variance on account of yield variations during the years 1966-67 to 1972-73 works out as follows:—

	Raffinate		Extract		Net difference in yield
	Qty. (tonnes)	Value* (Rs. in lakhs)	Qty. (tonnes)	Value (Rs. in lakhs) @Rs. 103·44	(Rs. in lakhs)
1966-67	(—) 1072	(—) 2·22	(+) 807	(+) 0·83	(—) 1·39
1967-68	(—) 3978	(—) 8·64	(+) 3296	(+) 3·41	(—) 5·23
1968-69	(+) 269	(+) 0·58	(—) 450	(—) 0·47	(+) 0·11
1969-70	(+) 697	(+) 1·52	(—) 1011	(—) 1·04	(+) 0·48
1970-71	(+) 3509	(+) 6·57	(—) 3909	(—) 4·04	(+) 2·53
1971-72	(+) 4008	(+) 7·96	(—) 4285	(—) 4·43	(+) 3·53
1972-73	(+) 8244	(+) 13·97	(—) 8847	(—) 11·71 (@133·06)	(+) 2·20
	(+) 11,668	(+) 19·74	(—) 14,399	(—) 17·51	(—) 2·23

* At the rate of Rs. 206·974, Rs. 216·7268, Rs. 213·8473, Rs. 217·4576, Rs. 187·0921, Rs. 198·60 and Rs. 169·49 respectively.

5.45. According to the Management the net realisation on the sale of products not passed through this unit was more than what could have been realised by selling the products from this Unit as superior kerosene and Tomex.

5.46. The economics of processing the entire feed stock through Kerosene Refining Unit of the Gauhati Refinery and the actual utilisation of these feed stocks partly in KRU and partly for blending of IK, HSD, LDO and FO in the years 1966-67 to 1972-73 as given on the basis of test run yield pattern was stated to be as follows:—

Year	Extra Realisation (Rs in lakhs)
1966-67	7·68
1967-68	20·69
1968-69	39·47
1969-70	19·66
1970-71	13·38
1971-72	23·34
1972-73	0·29

5.47. During evidence, the Committee enquired as to why it was necessary at all to pass any product through the Kerosene Refinery Unit, if the net realisation on the sale of products, not passed through this Unit was more than what could have been realised by selling the products from this Unit as superior kerosene and Iomex. While admitting that the net realisation was more on the sale of products not passed through this Unit, it was explained that "Gauhati area needed a certain amount of superior kerosene, this had to be brought from Calcutta to Assam. For this reason, the Unit had to be operated to supply the market. That can be met either by the process in the refinery or by importing Kerosene. If it is to be imported one should pay for the cost of transport. The choice was in favour of refining it further and producing the superior kerosene to meet the requirements of the country." It was however admitted that "the original planning was not correct" and the Unit was "too large".

5.48. The Committee find that the utilisation of capacity of the Kerosene Refining Unit was only 18.90 per cent, 31.84 per cent, 12.61 per cent, 19.33 per cent, 30.2 per cent, 27.2 per cent and 53.3 per cent of the designed capacity during the years 1966-67, 1967-68, 1968-69, 1969-70 and 1970-71, 1971-72 and 1972-73 respectively.. The shortfall in the utilisation of capacity was stated to be due to substantial change in the quality of crude resulting in lower percentage of kerosene production than that assumed at the time of designing the plant. Moreover coke kerosene from the Coking Unit could not be spared for processing in this Unit as the same was required to be blended into diesel oil and fuel oil. The Committee also note that the Unit could not be run continuously on account of problems of corrosion and low inventory of Sulpher dioxide. The Committee

are unable to appreciate as to why it is not possible for the Corporation to locate the sources of supply of Sulpher dioxide in time and take action well in advance to arrange for the supply of Sulpher dioxide.

5.49. The Committee were also informed that the inferior kerosene had a market and it could be produced without using the Kerosene Treating Unit. During the earlier years also there was the problem of finding a market for Iomex.

5.50. From the foregoing, the Committee are led to the conclusion that the Kerosene Refining Unit was set up without assessing the quality and quantity of inputs that would be available for processing in this Unit and without carrying out a detailed market survey for its product yield. The Committee regret to note that variation in the product yield compared to the yield envisaged in the Technical Project Report resulted in the loss of revenue to the extent of Rs. 35.57 lakhs during the years 1966-67 to 1972-73.

5.51. The Committee recommend that Government should enquire into the circumstances leading to the setting up of this Unit without proper planning and a detailed market survey. The Committee hope that at least now, in the light of the past experience, the Management would take advance action to ensure the availability of adequate quantity of Sulpher dioxide required for the operation of the Unit and avoid recurrence of problems like corrosion etc. so as to ensure continuity in operating the Unit and achieving maximum output of the installed capacity.

F. Production Performance—Coking Unit

5·52 The table below indicates the quantity of coke and other by-products to be produced as per the Project design and the quantity actually produced during the last four years ended March, 1970.

Quantity in tonnes

Products	Output as per Project design	% to total designed Output	1966-67		1967-68		1968-69		1969-70	
			Actual output	%to actual output	Actual output	%to actual output	Actual output	% to actual output	Actual output	% to actual output
Coking Gasoline	24,000	8·0	23,914	7·97	28,583	8·2	27,270	8·1	20,552	6·30
Coking Kerosene-I	30,000	10·0	45,246	15·08	39,040	11·2	36,061	10·7	34,374	10·50
Coking Kerosene-II	24,000	8·0	35,770	11·92	54,404	15·6	57,149	17·0	54,794	16·73
Coking Gas Oil	65,000	21·7	48,451	16·15	53,846	15·4	56,294	16·8	55,096	16·80
Fuel Oil } Residue	85,000	28·3	30,583	10·20	38,701	11·1	36,475	10·9	34,845	10·64
			31,725	10·58	39,719	11·4	36,066	10·7	42,986	13·14
Coke	39,000	13·0	39,779	13·26	45,533	13·0	48,886	14·6	44,011	13·44
Gas } Loss	33,000	11·0	30,902	10·30	34,773	10·0	30,222	9·0	32,179	9·83
			13,390	4·46	14,200	4·0	7,375	2·2	8,450	2·58
Slops	..	..	227	0·08	304	0·1	125	..	139	0·04
	300,000	100·0	2,99,987	100·0	3,49,103	100·0	3,35,923	100·0	327,434	100·0
% of actual production to designed capacity.				100·0		116·37		111·97		109·14

5.53. The figures relating to the years 1970-71 to 1972-73 are as follows:—

(Quantity in tonnes)

Products	1970-71		1971-72		1972-73	
	Actual output		Actual	Output	Actual	Output
	Quantity	% to actual output	Quantity	% to actual output	Quantity	% to actual output
Coking Gasoline	22413	7·6	21742	6·9	21650	6·7
Coking Kerosene-I	31850	10.7	33506	10·6	32960	10·2
Coking Kerosene-II	46534	15·7	51550	16·3	53711	16·6
Coking Gas Oil	47804	16·1	52792	16·7	54885	17·0
Fuel Oil	38548	13·0	39082	12·3	39654	12·3
Residue	34567	11.6	37080	11·7	34743	10·7
Coke	38889	13·1	41224	13·0	42058	13·0
Gas	29147	9·8	32677	10·3	36542	11·3
Loss	6880	2·3	7031	2·2	7130	2·2
Slops	175	0·1	195		121	..
	296807	100·0	316879	100·0	323454	100·0
% of the actual production to designed capacity		98·9		105·6		107·8

5.54. The total output was more than the designed capacity during the years 1967-68, 1968-69, 1969-70, 1970-71 and 1972-73.

5.55. The Committee were informed that the Unit had an additional inbuilt capacity of 10 per cent over the design. It was also stated that the operation of coking unit was regulated as per feed stock availability. The crude throughput in 1970-71 was low and due to low crude throughput, the production of reduced crude the feed stock for Coking Unit, was also low.

5.56. From the table at pages 101 and 102 it is see that the percentage of gas and loss (together) during the past seven years was more than that envisaged in the Project design. In this connection the Management stated that the Coking Unit was operated at a higher transfer temperature than the designed level. This was mainly to improve the

yield of Kerosenes, the cutter stocks required for blending of HSD, LDO and FO and also to reduce the yield of fuel oil which was a problematic stream for disposal in view of its low carbon content and high pour point. As a result of operating at the higher transfer temperature, production of gas was more than the designed level.

5.57. During evidence the Committee enquired as to why the actual product pattern differed from that envisaged in the project design. The Managing Director explained the position as follows:—

"(1) The quality of crude has changed quite a lot.

(2) We have to make a high speed diesel oil according to the specification and the specification which was given in the project design is not the same which we are producing now.

(3) When the Rumanians designed this project, they thought that the fuel oil which was left as residue could be sold as fuel oil. But it was not the case. So, for these reasons, there has been a variation between the project and what we have been running now."

5.58. Asked as to how the profitability of actual product pattern compared with that envisaged in the project design it was stated as under:—

"We have done some calculation. We have found that it is almost equal. There is not much difference. But, at the same time in that refinery we have not been able to utilise all our gases, with the result our profitability in that refinery has been lowered. If we utilise all the gases which are produced in that refinery, our profitability will be increased by another Rs. 10 lakhs. There is some difference between the project design and this."

5.59. It was also stated that the product pattern followed during the actual operation reduced the profitability by Rs. 27.2 lakhs during the seven years 1966-67 to 1972-73.

5.60. The Committee find that the percentage of "gas" and "loss" together was more than that envisaged in the project design. The change in the product pattern from the original design has already resulted in a loss of Rs. 27.2 lakhs during the year 1966-67 to 1972-73 and there would also be a recurring loss of Rs. 10 lakhs per annum. The Committee recommend that the operation of the Unit should be so regulated that the production of gas is reduced to the minimum. They also recommend that Government/Corporation should consider seriously the feasibility of converting the gas as fuel for domestic consumption and avoid a recurring loss thereon.

G. Sale of Raw Petroleum Coke

5.61. On 23rd June, 1961, the Indian Oil Company Limited, the sole marketing agents of Indian Refineries Ltd. (IRL) entered into an agreement with M/s. India Carbon Limited (ICL) for the sale of raw petroleum coke (RPC). The latter agreed to purchase from the Company during the continuance of the agreement all the saleable petroleum coke to be produced by the Refinery. According to the agreement, the Corporation was to give notice from time to time to the purchaser of saleable petroleum coke available for delivery and the latter was to take delivery thereof. The agreement did not contain any penalty clause. The firm failed to clear the stock of coke in time on several occasions, with the result that large quantities of coke remained with the Company.

5.62. The agreement inter alia provided for the delivery of coke by the Refinery at its coke yard. The firm, however, made use of the Refinery's railway siding for which no recovery was made. The amount not recovered for the period upto March, 1970 was Rs. 2.50 lakhs. It has been stated by the Management that at the time of renewal of the contract in 1969, efforts were made to persuade the party to pay these charges, but it refused to pay on the plea that these charges were not paid by it earlier and that the siding was used also for purposes other than the transport of coke.

5.63. In a written note the Management explained the position as follows:—

> "In the agreement signed with ICL for 7 years from June, 1962, IOC was to make RPC avaiable at the refinery cokeyard and the party was to uplift the product from the cokeyard at their expenses. If the party had employed manual labour bagging and moving RPC, the question of our imposing any extra charges should not have arisen. Temporary railway track had been laid to bring in materials of construction and because of the proximity of this track to the cokeyard, it was linked up with the track leading from the refinery cokeyard to ICL's plant to enable ICL to load wagons and haul the product to their factory. Refinery's crane was used for this purpose and a cranage charge of Rs. 1.10 per MT was collected from ICL, and whenever refinery shunter was used, the party was paying Rs. 0.95 per MT as haulage charges. Our refineries division, have computed a cost of Rs. 2.50 per MT as cost of transportation of 1 ton of RPC from our refinery cokeyard to ICL's siding using our refinery shunter. The amount of Rs. 2.50 lakhs indicated is the total amount computed on the basis of non-payment @ Rs. 1.55 per MT by ICL since they were using their own wagons and shunters. Normally the railway siding

charges are payable to the Railways for placement of wagons by railways at a specified siding and inasmuch as party was/is using its own wagons and was/is placing its wagons, the question of siding charges payable to Railways does not arise and as has been explained above, it is only part of the cost that has not been recovered and IOC also was not in a bargainable position to insist on party's payment of these charges as they were not included in the agreement and was subsequently raised by the refineries during the operation of the agreement."

5.64. In respect of writing off Rs. 2.50 lakhs, it has been stated that "the siding charges are not recoverable as per agreement and therefore, the Croporation has to to absorb this."

5.65. The Committee enquired whether the use of Railway siding was made even after March, 1970 and whether the IOC was so much dependent on this firm for the disposal of petroleum coke that it had to agree to this concession while renewing the contract.

5.66. The Management stated as follows:—

"Even at the time of renewing the agreement in 1969, the RPC market had not picked up with the additional production of 90,000 MT of RPC at Barauni Refinery, IOC had advertised widely on the availability of this product and despite these vigorous efforts, a business of only around 1,000 MT per month, outside the calcination plant of ICL at Gauhati did materialise. In view of this, IOC explored international market and exported about 45,000 MT of RPC during the years 1966 to 1968 at prices varying from Rs. 80 to Rs. 93 per MT F.O.R. Barauni.

Placed as we were with around 1,40,000 M.T. of RPC for disposal from Gauhati and Barauni Refineries whose production will be hampered if the same was not disposed at uniform rate, we were able to not only incorporate a penalty clause, which protected IOC's interest in the case of non-movement of RPC by ICL from Gauhati Refinery but also covered up the shortfall in recovery on transportation cost of RPC from refinery coke-yard to ICL as follows:—

	Previous Rs.	After Rs.
Haulage charge.	0·95/MT	34/hour
Cranage charge	1·10/MT	2·25/MT

The above ompensated adequately the total cost incurred by the Refinery."

5.67. During evidence the Managing Director (Marketing Division) stated that "in the original agreement our under-recoveries were such which gave the figure of Rs. 2½ lakhs. Since then under recoveries have been reduced to paise 50 per metric tonnes."

5.68. With regard to the fixation of price for the sale of raw petroleum coke to M/s. India Carbon Ltd. the Management stated that in 1961 with the commissioning of Gauhati Refinery the then Indian Oil Company was faced with the disposal problem of raw Petroleum Coke (RPC), thrown out in huge quantities by the Coking Unit of the Refinery. The only other producer of Raw Petroleum Coke viz. Assam Oil Company, Digboi, was also facing similar marketing problem as no proper market was existing for this product. The bulk of Assam Oil Company's production of RPC was being sold to Aluminium Industry at a price of around Rs. 50 per MT during that period and after commissioning of India Carbon Ltd. (ICL)'s plant they started supplying @ Rs. 110 per M.T.

5.69. The problem was acute in that the Refinery could not hold more than 2½ month's production of RPC and unless the movement of RPC was uniform and large, it would have necessitated shut down of the Coking Unit thereby reducing the crude intake of the refinery. Negotiations were started with ICC's offer to RPC at Rs. 180 per MT against ICL's demand for the product at around Rs. 80 per M.T. Finally the price was fixed at Rs. 124 per MT which matched Assam Oil Company best price for their products *viz.* Rs. 110 per MT plus Gauhati-Digboi freight amounting to Rs. 14 per M.T.

5.70. About the fixation of price at the time of renewal of the contract in 1969, it was stated that there was no market for RPC at that time and also when the price revision was made during 1969, the crude price was going down and therefore, only the devaluation on the rupee was taken into account. The price was negotiated and finalised at Rs. 165 per metric tonne.

5.71. During evidence the representative of Indian Oil Corporation (Marketing Division) stated that "under this agreement, the unfortunate thing was that there was no clause to provide for the increase in the price of this commodity during the pendency of this agreement, and that is why we are stuck up with this price. In the case of Barauni Refinery, we have revised the price to Rs. 260 per MT based on the increase in the price of crude.

5.72. The Committee enquired about the loss suffered by IOC in the sale of coke to M/s. India Carbon Ltd. with reference to the revised

price fixed in the case of coke sold by Barauni Refinery. In a written note the Management stated as follows:—

> "It has been possible for IOC to raise the RPC price to Rs. 260 MT in the month of August, 1973 only because the entire production of RPC at Gauhati Refinery is being sold to India Carbon Ltd. and a major portion of our Barauni production is being used in our own Calcination plant at Barauni leaving only around 30,000 MT per annum for sale to general trade. The general trade demand is currently in excess of the balance availability indicated above. It is only because of this factor that IOC was able to realise a higher price viz. 260 MT. On the other hand if we were to market the entire production of Gauhati/Barauni after taking into account Barauni Calcination plant requirements, then we would have had a surplus of RPC and we would then not have been able to realise a higher price. Furthermore, this would have adversely affected the operation of both the refineries. However, in answer to the question, we would like to state that notional price differential on quantities sold to ICL ex-Gauhati at Rs. 165 MT against selling price of Rs. 195 MT from 4th August, 1971 and Rs. 260 MT from 1st August, 1973 ex-heaps at Barauni to general trade, would approximately amount to Rs. 30,00,000. However, we do not consider this amount to be a loss."

5.73. Asked about the manufacturing cost of raw petroleum coke, the Ministry stated that:—

> "It is not possible to work out the manufacturing cost of raw petroleum coke as such from any refinery and to the best of our knowledge this data is not available. Therefore, pricing of their petroleum coke is entirely based on the economics of law of supply and demand."

5.74. The Committee enquired whether the fixation of price merely on the basis of economics of law of supply and demand was correct method. The Ministry stated as follows:—

> "Under normal circumstances, particularly in regard to the production of by-products like Raw Petroleum Coke, it would be correct to assume that the price would have relationship to supply and demand. As such, the price is necessarily to be negotiated by the buyer and the seller on a commercial basis.

Apart from this consideration, in an oil refinery, it is not possible to work out the cost of production of any individual product because the same raw material namely crude oil is utilised to produce a large variety of products with the same proces-ing units. Allocation of costs, can, therefore, at best be an arbitrary process and would not reflect the true cost of production.

Incidentally, raw petroleum coke is not a formula product and its price is, therefore, not determined by the Government under the informal pricing arrangement in vogue, in respect of bulk refined petroleum products."

5.75. The Committee find that an agreement was entered into with M/s. India Carbon Ltd. (ICL) in June, 1961 for the sale of Raw Petroleum Coke (RPC) ex-Gauhati. The agreement did not contain any penalty clause in order to protect the interest of the Corporation in the case of non-movement of RPC by ICL. On several occasions the firm failed to clear the stock of coke in time with the result that large quantities of coke remained with the Refinery.

5.76. The Committee further note that as per agreement, the Corporation was to make "RPC available at the Refinery Cokeyard and the party was to unlift the product from the Cokeyard at their expense." The Refinery's railway track, was, however, linked up with the track leading from the Refinery Cokeyard to ICL's plant to enable ICL to load wagons and haul the product to their factory. M/s. India Carbon Ltd. made use of the track but no recovery was made from the firm for using the track. The amount not recovered for the period upto March, 1970 was Rs. 2.50 lakhs. The Committee are surprised to note that even while renewing the agreement in 1969 no provision was made for the recovery of railway siding charges and M/s. India Carbon Ltd. continued to enjoy the facility free of cost. According to the Management the existing under-recoveries to the extent of 50 paise per metric tonne continued to be incurred.

5.77. The Committee are further informed that it was not possible to work out the manufacturing cost of raw petroleum Coke. The pricing was based on the economics of 'law of supply and demand'. Government had also not fixed any price for the raw petroleum coke as had been done in the case of bulk refined petroleum products. Thus the Corporation was free to negotiate the price from time to time on an ad-hoc basis. The Committee are surprised to find that the price of coke was not even linked up with the price of crude. There was no clause in the agreement with M/s. India Carbon Ltd. for the sale of coke ex-Gauhati to provide for the increase in the price of this commodity during the pendency of the agreement. Although the price of coke ex-Barauni has been fixed at

Rs. 260 per metric tonne, the sale of Coke-ex-Gauhati continued to be at the rate of Rs. 165 per metric tonne upto December, 1973 as per the agreement signed in 1969. National price differential on quantities sold to ICL ex-Gauhati has been calculated at Rs. 30 lakhs.*

5.78. The Committee view with concern the manner in which the agreement for the sale of raw petroleum coke from Gauhati Refinery was finalised with M|s. India Carbon Ltd. They therefore, recommend that the whole matter regarding the sale of coke to M|s. India Carbon Ltd. ex-Gauhati should be thoroughly investigated in order to fix responsibility for the huge loss suffered by the Corporation.

5.79. The Committee further recommend that the price of coke should be realistically fixed by Corporation keeping in view the current increase in crude price and also the latest demand pattern.

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* At the time of factual verification the Indian Oil Corporation have stated as follows :—

"The Corporation has since conducted negotiations with M/s. India Carbon Ltd and they have agreed to pay revised price of Rs 845 per M.T.with effect from 1-1-74 to match the enhanced crude price of US $ 8·48 BBL. This price is also applicable to coke being sold from Barauni and the price is subject to revision on the basis of crude price. The firm has agreed to the revised price in spite of a fixed price agreement upto June, 1974. This will bring to the Corporation an additional revenue of over a crore of rupees."

H. Processing Costs — Kerosene Refining Unit

5.80 The table below indicates the fixed and variable costs per tonne of feed stock processed during the seven years ended 31st March, 1973:—

Intake (in tonnes)	1966-67		1967-68		1968-69		1969-70		1970-71		1971-72		1972-73	
	43509		73305		29018		44499		69591		62712		122748	
	Rs. in lakhs	Rs/t	Rs. in lakhs	Rs/t	Rs. in lakhs	Rs/t	Rs. in lakhs	Rs/t	Rs. in lakhs	Rs/t	Rs. in lakhs	Rs/t	Rs. in lakhs	Rs/t
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Variable expenses :														
Chemicals .	3·16	7.29	6·03	8.23	3.34	11.49	4.99	11·21	4·40	6·32	5·16	8·23	7·05	5·74
Utilities . .	7·02	16·14	15·46	21·09	7·99	27·53	14·22	31·98	24·19	34·76	21·80	34·76	35·04	28·55
Maintenance .	2·35	5·43	4·33	5·90	3·99	13·74	1·84	4·14	2·47	3·55	3·07	4·90	2·80	2·28
Stores . .	0·33	0·76	0·81	1·11	1·06	3·65	0·61	1·37	0·64	0·92	0·81	1·29	1·23	1·00
TOTAL . .	12·86	29·62	26·63	36·33	16·38	56·41	21·66	48·70	31·70	45·55	30·84	49·18	46·12	37·57

	1		3	4	5	6	7	8	9	10	11	12	13	14
Fixed Expenses:														
Establishment .	0·84		1·76		1·78		2·21		2·75		2·63		2·67	
Depreciation .	6·74		6·77		5·71		5·65		5·66		5·66		5·66	
Interest . .	2·88		1·72		1·86		1·72		1·71		1·91		1·67	
Overheads .	5·05		10·06		10·13		13·42		16·55		14·03		14·77	
Overtime .	..		0·10		0·12		0·23		0·27		0·31		0·47	
	15·51	35·61	20·41	27·84	19·60	67·61	23·23	52·24	26·94	38·71	24·54	39·18	25·24	20·56

NOTE :—According to the Ministry (April, 1972) the gradual increase in establishment expenssess and overheads was mainly due to increase in wages consequent on settlement made with labour union in 1967-68 (with retrospective effect) and progressive increase in the rate of bonus.

5.81. From the above table it is seen that the cost of utilities and chemicals per tonne of feed stock varied from year to year.

Consumption of Chemicals

5.82. The norms indicated by the Rumanians and the actual Consumption (in physical terms) of Sulphur-di-oxide tonnes of feed stock processed and of causaic soda per 100 tonnes of raffinate and extract produced was as follows:—

Year	Sulphur-di-oxide	Caustic Soda
	Consumption per 100 tonnes of feed stock Kg.	Consumption per tonnes of raffinate and extract produce Kg.
Design Actuals .	391·65	9·21
1966-67 .	191·45	27·95
1967-68 .	294·41	43·24
1968-69 .	415·51	71·18
1969-70 .	373·67	79·42
1970-71 .	196·27	78·63
1971-72 .	248·48	64·29
1972-73 .	179·15	37·69

5.83. The increase in the consumption of sulphur-di-oxide in 1968-69 was stated to be due to low inventory on account of irregular supply and frequent interruptions in the unit operations. In 1971-72 it was due to vacuum pump failure for want of imported spares. In the absence of vacuum pump air had to be vented from vessel *vs* which resulted in excess of SO_2 loss.

5.84.The increase in consumption of caustic soda during 1965—69 has been attributed to change in the caustic wash system to prevent caustic carry over to run down tanks and in 1969-70 it was due to production of hypochlorite solution required for ATF production.

Consumption of Utilities

5.85. The norms indicated by the Rumanians and the actual consumption of utilities per tonne feed stock processed in the Kerosene Refining Unit for the years 1966-67 to 1972-73 are given below:—

Consumption of utilities per tonne of Feed stock

	Design	66-67	67-68	68-69	69-70	70-71	71-72	72-73
Power (in KWH)	31·0	30·77	30·16	27·27	35·37	34·24	35·28	28·99
Steam. (MT) .	0·485	0·16	0·33	0·37	0·28	0·34	0·41	0·34
Comp. Air (M3)	1·03	7·43	5·32	13·47	13·77	9·17	9·90	4·77
IND&REC Water (M3)	31·0	29·23	39·27	60·17	65·09	42·52	45·72	29·32

5.86. It may be seen from the table that while the consumption of Power and Steam has been close to the indicated norms, the consumption of Compressed oil air water has been generally higher than the norms.

5.87. The increase in the cost of utilities was partly due to lower average throughout per day resulting from longer period of operation despite restricted throughput. The longer period of operation was necessary to tide over the corrosion problems which would have arisen if the Unit had been kept under operation for short duration.

5.88. As regards the consumption of utilities the Management stated as follows:—

> "While it may be admitted that there are variations in the consumption of utilities from year to year.....the consumption of utilities as shown in the statement does not reflect the utilities required for production alone, as utilities required for maintenance have also been included in the same. It may, further be pointed out that at certain points of time, due to corrosion problems, the consumption of some utilities like compressed air may have been high, although the production was less."

The bifurcation of the consumption of utilities for production and for maintenanc is, according to management, not possible.

It has further been stated that the cost of utilities is allocated to different units on the basis of actuals|estimated consumption. "Although there may be variations in the consumption of utilities and in the costs allocated.....the overall cost

of production of utilities also remain nearly fixed as this mainly consists of salaries, depreciation, interest etc. ..... As such the cost allocation due to utilities consumption does not represent the out of pocket expenditure nor can this be reduced proportionately if utility consumptions were lower."

5.89. Regarding the reasons for the wide variations in the consumption of utilities, the Managing Director stated during evidence as follows:—

"As far as consumption of utilities is concerned, particularly with regard to the refineries which have been built with Soviet or Rumanian collaboration, we did not have enough meters for individual units."

He added:—

"We are gradually installing these meters so that we can allocate the utilities in respect of each and every plant. We have already installed two meters. We will be installing another 5 meters in eight months time. We have introduced a system of technical auditing, so that we can have better allocation of utilities in a particular plant for which meter has been introduced. We are in the process of doing this in all the refineries gradually so that our system of technical auditing can be more effectively utilised."

5.90. It was also stated that Refinery went on stream in December, 1961. In the initial years efforts were mainly directed to stabilise unit operations. Since the overall consumption of utilities for the whole refinery was reasonable compared to the norms, the consumption of utilities in individual units was not followed very vigorously. With the establishment of the Technical Audit Cell in the refineries, this aspect is being given more attention. Additional meters are now being provided.

5.91. The Committee note the wide variations in the consumption of utilities from year to year. One of the reasons is stated to be that utilities for production have not been separated from those for maintenance.

5.92. The Committee are surprised to find that though the Refinery went on stream in December, 1961, the Management had not installed meters to ascertain and keep a check over the actual consumption of utilities in the different units.

5.93. The Committee fail to understand as to why this important aspect was overlooked all along. The Committee stress that the process of installation of meters in the Refineries should be expedited. Norms for various processes had also not been fixed. The Committee need hardly emphasise that without an accurate system of recording the consumption of utilities, it is not possible to make use of the system of costing as an instrument of

control and also work out the processing cost on a realistic basis. The Committee also urge that the technical auditing should be intensified so that there should be an effective control on consumption of utilities. The Committee urge that there should be a proper assessment of the consumption of utilities on production and maintenance and determination of costs on a scientific and accurate basis.

L. Production of Liquified Petroleum Gas (LPG)

5.94. In June, 1964 the Refinery authorities submitted a Project Report for the manufacture of 6,000 tonnes of L.P.G. per year (with possibility to increase it to 11,000 tonnes), at an estimated cost of Rs. 16.09 lakhs (excluding the cost of additional compressors and their installation), the feed stock being the refinery gases from the Crude Distillation and Coking Units.

5.95. The Rumanians also submitted a scheme for LPG manufacture for an immediate capacity of 25000 tonnes per annum and with potential capacity of 6000 tonnes per annum as an integrated offer alongwith the proposal for expansion of Gauhati Refinery in September, 1964.

5.96. The scheme from the Rumanians as well as the proposal of Gauhati Refinery were examined by a Committee of Technical experts. It was decided that the scheme for manufacture of LPG should be disassociated from the expansion proposal. The results/views of the Committee were conveyed to the Government in February, 1965.

5.97. The Government, in view of the various considerations involved in the integrated offer from Rumanians, desired that the scheme for the manufacture of LPG be segregated from their expansion Project. This was discussed with Rumanians and later on a formal letter was written in October, 1965 to give a segregated scheme for LPG manufacture. The revised technical offer was received from Rumanians in February, 1966 which, on examination, was found to be sketchy and inadequate for reaching definite conclusions. Further discussions were held with Rumanian experts to provide a new offer keeping in view that no equipment installed in the refinery would be utilised for the LPG manufacture.

5.98. This request for not considering any equipment already installed in the refinery for LPG manufacture was in view of the Government directive to start production of JP-4 at Gauhati Refinery urgently. In view of this, the earlier thinking of utilising some of the available equipment in the refinery for manufacture of LPG at Gauhati had to be modified as the same equipment was required to be utilised for manufacture of JP-4 which had higher priority as compared to LPG.

5.99. After discussions with the Rumanians, the matter was again referred to the Government and the Government decided by the end of 1966 that further action be taken on the basis of the LPG manufacturing scheme prepared by Gauhati Refinery.

5.100. It thus took 2½ years for the Government to take a final decision that the LPG Project need not be entrusted to the Rumanians but that it could be done by the IOC departmentally. Thereafter the scheme was cleared and tenders were invited in 1967.

5.101. In response to the invitation three offers were received but they were found to be higher than the refinery's own estimates. In order to bring down the cost it was decided in December, 1967 that work should be done departmentally to the extent possible and the balance be assigned to contractors.

5.102. Subsequently, the layout of the Bottling Plant was modified and the estimates were brought down to Rs. 17.097 lakhs (with a foreign exchange component of Rs. 1.20 lakhs) and were approved on 30th January, 1968.

5.103. Thus it took one year on the attempts made to obtain quotations from Indian firms leading to the final decision to get the work done departmentally.

5.104. Action on this project was initiated from early 1968 and procurement action started which included supply of the storage vessels by Triveni Structurals Ltd. The order for the fabrication of equipment was placed on M/s. Triveni Structurals Ltd. in June, 1968. The scheduled date of delivery was 30th September, 1969. Howevet, M/s. Triveni Structurals failed to supply the storage vessels on this scheduled date. The contract with M/s. Triveni Structurals was cancelled on 3rd December, 1970. In a written reply the Ministry stated that the delay in completion of the project during this period was mostly on account of the failure on the part of M/s. Triveni Structurals Ltd. to supply the storage vessels as contracted for.

5.105. Before the Refinery could get another set of storage vessels, the Refinery considered the alternate scheme of utilising a spare vessel, available in the refinery as a temporary storage facility. This short-term scheme was implemented and LPG production was started from March, 1971.

5.106. When enquired by the Committee, whether the time taken in the process was quite normal, it was stated by the Management that "the time was not normal for a Project of this size but the whole thing got tied up. At that time Government asked Refinery to produce JP-4 fuel (JP-4) and the Refinery had to recast the programme."

5.107. The present production in the refinery was a little less than 1,000 tonnes per year. With the completion of the work and installation of permanent storage, the production level would increase to 2,500 tonnes per year. The project was expected to be completed by the last quarter of 1973.

J. Delay in the Supply of Storage Vessels by M/s. Triveni Structurals Limited

5.108. M/s. Triveni Structurals Ltd. in a written reply informed the Committee that the order for the storage vessels was placed with them by the IOC on 6/7th June, 1968 and the schedule date of delivery was 30th September, 1969. The dished ends for these vessels were sub-let on M/s. Anup. Engg. on 18th December, 1968. The agreed delivery for these dished ends was by the middle of June, 1969. However, due to machine break-down and technical difficulties it was not possible for M/s. Anup. Engineering to adhere to the committed schedule. In September, 1969 therefore a revised fabrication process was proposed for the dished ends which was referred to IOC's consultants CMERI, Durgapur for approval.

5.109. There was some delay on the part of CMERI, who finally regretted their inability to undertake the inspection of this job. The IOC, subsequently wanted the inspection to be entrusted to M/s. Lloyds, M/s. Lloyds, however, expressed their inability to undertake the inspection of the vessels at TSL, since M/s. TSL had just started fabrication and as per Lloyds, TSL would not be having sufficient experience required to meet the specifications. As such IOC intimated their intention to terminate the contract on 20th June, 1970. IOC finally cancelled the contract on the 3rd December, 1970.

5.110. M/s. Triveni Structural further stated "that delay accuring as a result of the inspection and testing of the storage vessels would be to the IOC's account".

5.111. In regard to the inspection and the further details of events leading to the cancellation of the contract, the IOC, however explained the position as follows:—

> "On 24-2-1970 Gauhati Refinery informed M/s. TSL telegraphically that a team of CMERI and IOC representatives would meet on 2-3-1970 at Ahmedabad for discussion and inspection of dished ends and then proceed to BHEL, Bhopal for laying down the procedure for inspection of vessels. In reply to this TSL informed Gauhati Refinery on 25-2-1970 that the dished ends are being fabricated under the inspection of M/s. Lloyds. Evidently TSL had unilaterally changed the Inspecting Authority without even informing IOC in the last stage violating the terms of the contract.

On 12-3-1970 it was decided at a meeting in Calcutta that the inspection of dished ends would be conducted by CMERI. However, they may accommodate M/s. Lloyds for spot checks.

CMERI expressed their inability to take up inspection as per the fabrication schedule communicated by TSL on 10-4-1970. CMERI also asked for an exorbitant amount of Rs. 1.5 lakhs for inspection.

On 30-4-1970 TSL suggested to allow M/s. Lloyds to inspect the dished ends.

During CME (Gauhati)'s meeting with M/s. Lloyds representatives on 10-6-1970 Lloyds informed that dished ends have been rejected by them due to manufacturing defects. As per M/s. Lloyds, the dished ends do not meet the required specification and have weld crack.

TSL again proposed that CMERI should be persuaded for inspection of dished ends. This was in contradiction to their earlier suggestion of getting dished ends inspected by M/s. Lloyds as mentioned above. Moreover, it is doubtful whether CMERI would pass the dished ends which have already been rejected by Lloyds. From the above it is apparent that M/s. TSL themselves changed the inspecting agency from CMERI to Lloyds without even informing IOC in time. Once the fabrication was rejected by Lloyds they again wanted to switch over to CMERI.

On 17-7-1970 in meeting TSL requested for 3 weeks time to review the entire position and advise their final position. This was agreed to by IOC and it was also suggested to TSL to look for alternate source of supply of LPG vessels viz. BHPV vizag etc. who would meet Lloyds' inspection procedure.

On 27-7-1970 TSL informed that BHPV can fabricate vessels conforming to ASME VIII only and not to BS-1515. TSL had designed the bullets according to BS-1515 specifications. According to TSL it would mean redesigning of the vessels.

IOC enquired from BHPV by telegram whether they can fabricate as per BS-1515. They confirmed by telegram that they can fabricate the vessels as per BS-1515 without any extra cost.

It is therefore evident that TSL did not make any effort to explore the possibility of getting the vessels fabricated by BHPV.

IOC referred the whole case to their solicitors to advise the course of action to be taken by them under the circumstances. After considering the various issues, the Legal Adviser suggested that the CMERI should be persuaded to undertake the inspections even though, according to solicitors also, it was doubtful

if TSL would be in a position to honour their commitments and any further action can be taken only after the inspections of dished ends is done. This IOC felt was not possible as it was doubtful whether CMERI would undertake the job and even if they had undertaken, whether the result would be anyway different.

Under the circumstances it was considered more appropriate to terminate the contract by mutual consent.

On 31-10-1970 there was a meeting between MD(IOC) and MD (TSL). It was decided in the meeting that the contract of LPG bullets between IOC and TSL can be terminated without any financial repercussions on either side. It was also decided that no party will lay any claim on the other for any damages.

Consequent to this, on 3-12-1970 GM (Gauhati) communicated to MD(TSL) confirming that the contract be treated as terminated with immediate effect."

5.112. Asked whether any penalty clause for the delay was included in the contract with M/s. Triveni Structurals Ltd. it was stated that a penalty clause was incorporated in the agreement with Messrs Triveni Structurals Limited for the supply of vessels which was as under:—

"The penalty shall be limited to 5 per cent of the balance work to be completed provided the supplies executed earlier have been in accordance with the agreed time schedule. If not, the penalty shall be imposed to a maximum of 5 per cent of the tendered amount."

5.113. Regarding the delay in the supply of vessels, M/s. Triveni Structurals Ltd. stated that "delay occuring as a result of the inspection and testing of the storage vessels would be to the IOC's account". About the loss incurred by them as a result of cancellation of the contract, they stated as follows:—

"TSL had ordered certain bought out items valued at Rs. 15,000. In addition, certain fabrication had already been in progress at HEL. Bhopal, to whom the fabrication work had been initially sub-let. Since the raw materials required for this job had already been received from HEL Bhopal at a cost of Rs. 2.15 lakhs the total implication of this cancellation as on December, 1970 was Rs. 2.30 lakhs approximately, out of this Rs. 2.15 lakhs can be considered as investment in raw-material supplied by HEL., Bhopal, which was taken on our inventory. The net loss suffered by TSL therefore is Rs. 15,000 due to cancellation of this job."

5.114. The Committee enquired whether the loss undergone on account of the delay in supply of these vessels had been worked out and what was the national loss during the period in which LPG was not produced. The Ministry have stated as under:—

> "The loss on account of delay in supply of these vessels has not been worked out. It may be mentioned that the development of LPG market is a gradual process and it is difficult to assess the demand level of LPG in 1969-70 and 1970-71, had the vessels been delivered in time and LPG production commenced from Gauhati Refinery. However LPG was taken from Barauni Refinery and marketed in Assam area from the year 1969 onwards till the production of LPG at Gauhati Refinery started."

5.115. The Committee enquired whether the financial implications regarding the cancellation of the contract had been considered and whether any responsibility for the loss incurred by both the parties *viz.* IOC and M/s. Triveni Structurals Ltd. as a result of cancellation of the contract had been fixed. In a written reply the Ministry have stated as follows:—

> "IOC cancelled the contract with M/s. TSL because they expected that there would be further delays in commissioning the project if the contract with TSL was continued. The contract was cancelled after discussions between the two undertakings. Since IOC had awarded the contract to TSL and they in turn had to depend on other agencies to fulfil the contract, no investigation has been made by the Ministry to determine the responsibility of individuals in the two Undertakings."

5.116. The Committee strongly deprecate the inordinate delay in the setting up of the project for the manufacture of Liquified Petroleum Gas (LPG) in Gauhati Refinery. The Project which was initiated in June, 1964 was completed only now i.e. after about 9-1|2 years. It took 2½ years for the Government to take a decision that LPG project need not be entrusted to the Rumanians but could be done by IOC. It took another year to decide that the work should be done departmentally instead of giving it to contractors. Order for the supply of vessels was placed with M|s. Triveni Structurals in June, 1968 after another six months, the scheduled date of delivery being 30th September, 1969. M/s. Triveni Structurals could not adhere to the schedule and the contract with them had to be cancelled in December, 1970.

5.117. M/s. Triveni Structurals conceded that they could not adhere to the scheduled dates of delivery but for further delay they laid the blame on the IOC who according to them could not arrange the inspection and

testing of the storage vessels. IOC on the other hand blamed M/s. Triveni Structurals for having unilaterally changed the inspection authority without even informing them thus violating the terms of the contract. Conflicting statement had been made by M/s. Triveni Structurals Ltd. and the IOC regarding the events leading to the cancellation of the contract.

5.118. The Committee regret to note the delay in the supply of vessels resulted in a loss not only to the Triveni Structurals Limited but to the refinery as during this period the Refinery gases were being flared without converting into LPG. The LPG had to be brought from Barauni Refinery and marketed in Assam area till the production of LPG at Gauhati Refinery started. But after the cancellation of contract with M/s. Triveni Structurals it took almost 3 years for the completion of the project.

5.119. The Committee are concerned to note that the Government Corporation have not found it necessary to calculate the loss suffered by the refinery as a result of delay in the commencement of production of LPG.

5.120. The Committee recommend that Government should analyse the causes for delay in the setting up of the Project with a view to fixing responsibility and in order to ensure that such lapses are avoided in future.

5.121. The Committee need hardly stress that the market for LPG should now be developed in the area and the Management should step up production in order to meet the entire demand for the area.

K. Consumption of Fuel Oil Instead of Refinery Gas

5.122. The Refinery commissioned in January, 1962 was designed to utilise most of the gas produced in the operational processes as heating fuel in the furnaces of the boiler house, distillation and coking units. From the very beginning, the gas compressors installed in the coking unit started giving unsatisfactory performance which was brought to the notice of the foreign suppliers from time to time between May and November, 1962. The General Manager reported in September, 1963 that the compressors were found to have been badly worn out and that, according to a foreign expert, the compressor bodies required extensive reboring. He again reported in October, 1963 that the capacity of the compressors was not adequate to handle the full quantity of gas produced in the Refinery. On 16th December, 1963 he further stated that the supply of compressors with inadequate capacity had resulted in a loss of 30 M. tons of gas every day at the flare costing approximately Rs. 2,000 per day and that this loss would continue until extra compressors were provided to handle all the gas produced in the Unit. In February, 1974 the Chief Production Engineer also reviewed the position and stated that as against the normal production of 4,450 M^3 of gas per hour, the capacity of compressors was 2,500 M^3

only and that the quantity of 1,950 M^3 of gas per hour was being burnt at the flare. He assessed the total financial loss due to the flaring of gas during 1962 and 1963 at Rs. 9,28,000. During 1964 and 1965, out of 81,701 M. tons of gas produced 31,892 M. tons of gas valued at Rs. 22.80 lakhs were flared.

5.123. Besides, owing to inadequate compressing capacity of the existing compressors, liquid fuel oil was being used as fuel instead of gas in the Refinery. The total quantity of the fuel oil used during the three years ending 31st March, 1966 worked out to 65,561 M. tons valued at Rs. 43.71 lakhs.

5.124. In this connection, the Ministry stated (January, 1967) as follows:—

> "It is true that this flare can be reduced by the installation of additional gas compressors.... On closer examination, this is being considered in collaboration with the problem of disposal of off-specification furnace oil which will be required to be disposed of. Installation of compressors above will not avoid the flaring of gas until market is created for off-specification furnace oil which will be replaced by the gas."

5.125. The flaring of gas was continued and further loss of Rs. 85.57 lakhs was incurred by the refinery during the year 1966-67 to 1972-73.

5.126. The Management stated that this loss was unavoidable and would persist until a market was found for coking fuel oil. During evidence the Managing Director explained the position as follows :—

> "This problem is there in that refinery from the beginning. Originally they thought whatever fuel oil they can produce can be marketed in India but later on it became the problem. Afterwards various schemes were considered as to how to dispose of the coking fuel oil but finally we had to burn it in our refinery. Ultimately, what has been decided is that the thermal power station which is coming up at Chanderpura will consume this coking fuel oil and when they start taking we will be able to solve this problem."

5.127. The Committee regret to note that the Refinery incurred a loss of more than a crore of rupees in the flaring of gas which could have otherwise been used as fuel. It is quite surprising that during the past 12 years, no market had been found for the coking fuel oil which was being used as fuel instead of gas in the Refinery.

5.128. The Committee would like to know as to why the economic feasibility of setting up a thermal power station utilising the coking fuel

oil was not examined by Government earlier. They hope that with the setting up of the Chandrapur Thermal Power Station, the loss in the refinery would be reduced to the minimum.

L. Delay in the Establishment of Facilities

5.129. On account of movement, spillage, leakage and dipping errors in the course of loading from the tanks to the tank wagons and tank lorries, loss of products occur. This results in the loss of revenue as well as the payment of excise duty on the quantity lost. The loss of revenue during the seven years ended 31st March, 1973 amounted to Rs. 33,28 lakhs as detailed below:—

Year	Amount Rs.
1966-67	3·69
1967-68	5·00
1968-69	8·95
1969-70	2·67
1970-71	1·89
1971-72	5·43
1972-73	5·65
	33·28

5.130. With a view to reduce (by 50 per cent) the spillage and losses of products, the Refinery authorities proposed in July, 1968 the installation of five tanks (of 200 M^3 capacity) and ten pumps for the loading of JP-4, ATF, MS, SK and IK at an estimated cost of Rs. 10.36 lakhs. The Chief Inspector of Explosives, Nagpur who was addressed on 1st August, 1968, approved the location of the tanks and pump house on 24th July, 1969.

5.131. On 22nd July 1969, the Refinery authorities decided to revise the Batchloading Scheme due to introduction of self removal procedure for the products but finding that there was no change in the new procedure, so far as levy of excise duty was concerned the revision of scheme was dropped on 2nd September, 1969.

5.132. Tenders for the mechanical and civil works were invited on 24th October, 1969 and 13th December, 1969 respectively and opened on 15th January, 1970 the validity period being upto 15th April, 1970. Tenders for the electrical works were not invited.

5.133. As the expansion of the Refinery from 0.75 million tonnes to 1.75 million tonnes which was under consideration, would have necessitated the modification of the scheme, the Refinery authorities decided on 11th May, 1970 to defer the project till a firm decision on expansion was taken. The earnest money was also released to the tenderer.

5.134. On 15th May, 1970 the Refinery authorities again decided to go ahead with the project as the payback period was very attractive. Fresh tenders were, therefore, invited on 10th July, 1970, 19th March, 1971 and 27th May, 1971 for civil, mechanical and electrical works respectively. The civil, mechanical and electrical works were awarded on 24th November, 1970, 19/21st August, 1971 and 22nd September, 1971 respetively. The project was completed in October|November, 1972.

5.135. The Ministry gave the following reasons for the delay in the establishment of facilities:—

(i) Time taken for taking approval of the Chief Inspector of Explosives.

(ii) The establishment of the facilities was also linked to the decision regarding expansion of Gauhati Refinery *vis-a-vis* establishment of new grass root refinery.

(iii) Delays also took place after the work had been awarded to the contractor. These were (a) Contractor not being able to obtain steel and pipes for civil works (b) Heavy monsoon affecting the work (c) Late arrival of the bending machine of the mechanical contractor due to floods (d) Delay in procurement of structural steel by the mechanical contractor due to scarcity of the items (e) Late delivery of gate valves which were to be supplied by refinery to the machanical contractor, on account of booking restrictions.

(iv) There was also some delay in the supply of drawings for execution to the civil contractor.

5.136. It was added that except for the delay in supplying the drawings for execution to the civil contractor, the other reasons were beyond the control of the Management.

5.136. During evidence, the Committee pointed out that the Refinery authorities decided on the 11th May, 1970 to defer the project till a firm decision on expansion was taken. But on 15th May, 1970 they again decided to go ahead with the project. The Managing Director replied that "there was no quick decision on the part of the Management at various stages. To take a decision on this project, there has been a management lapse."

5.138. The Committee regret to note that the Gauhati Refinery had to incur a loss of Rs. 33.28 lakhs during the years 1966-67 to 1972-73 on account of movement, spillage, leakage and dipping errors in the course of loading from the tanks to tank wagons and tank lorries. There has been inordinate delay in the establishment of facilities for reducing this recurring loss. The Committee recommend that the Government should analyse the causes for delay at various stages and at various levels with a view to fix responsibility.

5.139. The Committee would like to be informed as to what extent it has been possible to reduce the loss as a result of establishment of the facilities.

VI

BARAUNI REFINERY

6.1. The Barauni Refinery with an initial processing capacity of 2 million metric tonnes per annum was set up with the assistance of the Government of USSR in accordance with an agreement concluded between the Government of India and the Government of USSR in September, 1959. Under this argeement the Government of USSR agreed to give credit upto 100 million old Roubles at a rate of interest of 2.5 per cent repayable in 12 years. The construction work of the Refinery was started in the latter half of 1961 and the first million tonne capacity of the refinery went on stream from July, 1964. The second stage was completed in February, 1966 and the 3rd stage, comprising lube oil complex, was commissioned in November, 1967.

6.2. The Refinery has subsequently been expanded in 1969 to 3 million tonnes per annum capacity by adding one Atmospheric Unit of one million tonne capacity with the assistance of USSR.

6.3. The Refinery now consists of the following main processing units:—

2 Atmospheric Vacuum Units and 1 Atmospheric Unit

2 Kerosene treating units

1 Coking Unit

A Lube oil complex comprising 3 units

1 Bitumen unit

A Power Plant, and connected auxiliary services.

6.4. Later in 1971, a coke calcination Plant has also been added to calcine raw petroleum coke produced at the Refinery.

6.5. The major items produced in the Refinery are the Motor Spirit, Superior and Inferior Kerosene, High Speed Diesel, Light Diesel Oil, Furnance Oil, Naphtha, ATF, JP-4, Bitumen, Lube Oil, LSHS, LPG, Petroleum Coke, Calcind petroleum Coke and Phenol extract.

A. **Project Estimates and Actual Expenditure**

6.6. The following table indicates the originl estimates of the Refinery for the capacity of 2 million tonnes prepared by the Soviet experts prior to the preparation of working drawings (including facilities to be provided by the Company, such as land, township, water works, sewerage etc.), the

revised estimates, the date of revision and submission to Government for their approval and the actual expenditure as on 31st March, 1973.

(Rs in Crores)

Original Estimates	Revised Estimates	Date of revision and submission to Govt. for their approval	Actual expenditure as on 31st March, 1973
37·17	38·21		46·63
	40·77	September, 1961	
	44·14	July, 1965	
	47·27	March, 1969	
	47.46	July, 1971	

6.7. Sanctions to estimates for some of the constituents of the project given by Government upto June, 1962 amounted to Rs. 32.46 crores. The Management have informed the Committee that "the matter regarding the final approval of the complete Project cost is at present under correspondence with the Government of India."

6.8. During evidence the Committee pointed out that the Refinery for 2 million tonne capacity was commissioned for trial runs in July, 1964 whereas the Project estimates had not been sanctioned by Government even uptil now. The Additional Secretary stated as follows:

> "No feasibility report as such was prepared. It is not a very correct procedure that has been followed. They should have done that. But they went ahead with this project on the basis of some kind of cost estimate. Then, they were asked to make a detailed estimate and also give reasons for various extra increases. When this matter was placed before the Ministry of Finance, they pointed out that under certain items the cost had increased, and there were also some disputes on payments to the contractors, and the IOC was asked to furnish further details. The I.O.C. took quite some time in giving these details, and the revision of the cost estimates was made from time to time. The only control which Government had on this project was that while submitting their capital budget from time to time they had informed Government of the revision of cost estimates

I must say that there has been delay in sanctioning of this estimate."

6.9. In this connection, the Financial Adviser stated that "certainly, from the point of view of expenditure control, this is not a satisfactory way of doing business. The correct way of doing business would be to have the project estimates sanctioned and then watch the progress of expenditure against the sanctioned estimates."

6.10. The Committee take a serious note of the fact that although the Barauni Refinery with two million tonnes capacity was commissioned for trial runs in July, 1964, the complete cost of the project has not yet been approved by the Government. Sanctions given upto June, 1962 to the extent of Rs. 32.46 crores have been accorded by Government to some of the constituents of the Project. Thereafter these estimates have been revised by the Corporation several times and the Corporation continued with the work on the Project in anticipation of Government's approval to the revised estimates. An amount of Rs. 46.63 crores has already been spent on the Project. The Committee are also informed that no feasibility report was prepared. It has been admitted by the Additional Secreatry of the Ministry that the correct procedure was not followed.

6.11. The Committee have been repeatedly emphasising in their reports* that it is not correct to go ahead with the execution of a project without proper scrutiny of the feasibility Report therefor and an appropriate sanction of the project estimate. The Committee need hardly stress that the revised estimates of the Project should not merely be a completion report of the Project but should serve as an instrument of financial control. They, therefore, reiterate that the total commitments on a project should be prepared as realistically as possible in the beginning and should be available to Government and Parliament before a Project is approved. The Committee highly deplore the delay on the part of the Government/Corporation in finalising the estimates. They would like that responsibility for the delay should be fixed. The Committee recommend that the revised estimates should be finanlised without any further delay.

6.12. The Committee also reiterate that the implications of the increased capital investment on the economics of the Project should be critically gone into and brought to the notice of Parliament as recommended by the Committee in paragraph 2.20 of their Thirty-Ninth Report (Fifth Lok Sabha).

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*Please see Eighteenth and Thirty-Ninth Reports of the Committee on Public Undertakings (Fifth Lok Sabha).

B. Production Performance—Atmospheric Vacuum Units I and II and Atmospheric Unit III

6.13. The total crude oil including slops processed in the three units from 1966-67 to 1968-69 is shown below:—

(Tonnes in lakhs)

Year	Designed capacity	Crude oil processed (actual)	Shortfall	
			quantity	Percentage of designed capacity
1966-67 .	20·00	11·46	8·54	42·70
1967-68 .	20·00	16·59	3·41	17·05
1968-69*	21·73	17·91	3·82	17.58

*Atmospheric Unit III was commissioned in January, 1969. During January-March 1969 it processed 0.34 lakhs tonnes of crude oil. The unit was mainly operated to observe in detail the performance of various equipments.

6.14. The AVUS I & II processed a lesser quantity of crude oil during 1966-67 to 1968-69 than their designed capacity of 2 million tonnes per annum. Assuming that these Units are capable of attaining 60 per cent of the rated capacity in the first year of production, 80 per cent in the second year and 100 per cent in the third year, the shortfall in the quantity of crude oil processed works out as under:—

Year	Shortfall (tonnes)
1966-67 .	423280
1967-68 .	172149
1968-69	209196

6.15. The shortfall in the throughput has been atributed (July, 1971) by the Management to the following reasons:—

(i) Time-lag between the starting of different Units;

(ii) Lower capacity of the Coking Unit;

(iii) Irregular operation of Lube oil complex/Bitumen Unit;

(iv) Build-up of the reduced crude/L.S.H.S. stocks during 1966, 1967 and 1968, creating problems of tankage availability;

(v) Shut-down of the Refinery for 13 days in March, 1968 as per directive of the Government (80,000 tonnes);

(vi) Excess supply of crude oil (35,568 tonnes) to Gauhati Refinery during 1967-68; and

(vii) Shut-down of the Refinery for 23 days in October, 1968 due to breaches in the crude oil pipeline on account of floods in Teesta River (1,40,000 tonnes).

6.16. Taking into account the problems in the secondary processing units and the factors mentioned above, the quantity of crude oil that could have been processed during 1966-67, 1967-68 and 1968-69 in the two Units and the actual quantity processed are mentioned below:—

(In tonnes)

Year	Maximum quantity of crude oil which could have been processed	crude oil actually processed (excluding slops)	Shortfall	Percentage of shortfall
1966-67	11,57,000	11,13,885	43,115	3·7
1967-68	16,61,000	16,29,62 5	31,375	1·9
1968-69	17,60,000	17,67,129		

6.17. The total crude oil including slops processed in the three Units during 1969-70 to 1972-73 is shown below:

(Tonnes in lakhs)

Year	Designed capacity	Crude oil processed (actual)	Shortfall	
			Quantity	Percentage of designed capacity
1969-70	30	21·12	8·88	29·60
1970-71	30	22·19	7·81	26·03
1971-72	30	23·09	6.91	23.03
1972-73	30	24·26	5·74	19·13

6.18. It has been stated that the installed capacity could not be utilised fully during these years due to limited crude availability from Assam fields. In 1972-73 throughput was slightly more than the previous years because processing of imported crude was started in Atmosphere Unit III from December, 1972 onwards in addition to the crude available from Assam fields.

6.19. The Committee have elsewhere in this Report dealt in detail the question of under-utilisation of the refining capacity at the Barauni Refinery. They would like to stress that all out efforts should be made to fully utilise the available capacity in the Public Sector Refineries and the question of further expansion should be considered only after realistically assessing the availability of indigenous and imported crude and after a firm commitment therefor is made.

C. Production Performance—Kerosene Treating Units

6.20. There are two Kerosene Treating Units at the Barauni Refinery each with a capacity of 3,00,000 tonnes per year. The Units were designed with a view to upgrade the Kerosene produced from two Atmospheric Distillation Units and the Coking Unit. The products proposed to be obtained from the two Kerosene Treating Units were superior kerosene, inferior kerosene and aviation turbine fuel alongwith the resulting aromatic extracts. According to the Detailed Project Report 2,70,000 tonnes per year of Kerosene feed Stock obtained from the Atmospheric Distillation Unit No. I was to be treated in the Kerosene Treating Unit No. I to produce superior kerosene, while 288,000 tonnes per year of kerosene feed stock consisting of 210,000 tonnes per year from the Atmospheric Vacuum Unit No. II and 78,000 tonnes per year from the Coking Unit were to be treated in the Kerosene Treating Unit No. II in a block wise operation to produce aviation turbine fuel and inferior kerosene respectively.

Kerosene Treating Unit I

6.21. The table below indicates the designed processing capacity of Kerosene Unit I and the feed stock actually processed during the seven years ended 31st March, 1973.

(In—tonnes)

	Designed capacity	Quantity of feed stock actually processed				
		1966-67	1967-68	1968-69	1969-70	1970-71
Feed stock	2,70,000	1,85,531	2,91,071	2,04,058	2,86,341	3,56,202
Percentage to designed capacity		68·7	107.8	75·6	106·1	131·9

	1971-72	1972-73
Feed stock .	320808	308940
ercentage to designed capacity .	118·8	114·4

6.22. The quantity of feed stock processed during 1968-69 to 1972-73 include the quantity passed through splitter column of Kerosene Treating Unit II. It has been stated that the splitting operation is being carried out in Kerosene Treating Unit II alongwith the Kerosene Treating Unit I operation whenever necessary or in both the Units during the shut down period of Kerosene Treating Unit I to meet cutter stock requirements.

6.23. It has been stated that this unit has an in-built capacity of 4 to 5 per cent over the design.

6.24. The main reasons for the low throughput during 1966-67 and 1968-69 were as follows:—

1966-67—Non-availability of adequate quantity of feed stock on account of lesser quantity of crude oil processed and high stock of superior kerosene.

1968-69—Inadequate availability of sulpherdioxide.

Kerosene Treating Unit II

6.25. Kerosene Treating Unit II set up at a cost of Rs. 1.24 crores (including the cost of intermediate tankage) was completely idle from 22nd December, 1965 (date of completion) to 1st May, 1968. It was used for 93 days and 80 days during 1968-69 and 1969-70 respectively. The Unit was operated for splitting up of kero-distillate during the shut down of Kerosene Treating Unit I. The Unit was also used for hypochlorite treatment of superior kerosene raffinate and heat treatment of kerosene raffinate for the production of ATF, after carrying out certain modifications.

6.26. The creation of extra capacity in Kerosene Treating Units Nos. I & II *vis-a-vis* the availability of feed stock, and consequent non-utilisation of Kerosene Treating Unit No. II was considered by the Committee on Public Undertakings in paragraphs 96-100 of their 36th Report (Third Lok Sabha—March, 1967). Government informed the Committee on 25th April, 1968 that the Second Unit was likely to be utilised when Atomspheric Unit No. III went on stream. The Atmospheric Unit III was commissioned in January, 1969 but as already discussed in Chapter II, Atmospheric Unit III could not be put to effective use till November, 1972 because of non-availability of crude oil.

6.27. Even after the Atmospheric Unit started processing imported crude oil, the Kerosene Treating Unit II could not be operated as kerosene obtained from the Middle Eastern crude oil did not require sulphur dioxide extraction.

6.29. The Management have stated that the "redundancy of second Kerosene Treating Unit arose out of clanges in crule quality and changes in marketing specifications for HSD which are beyond anyone's control."

6.30. During evidence the Management stated that "whatever kerosene was produced from 2.2 million tonnes of indigenous crude, it was processed through one Unit and that was enough. It had been decided to utilise the Kerosene Treating Unit II for the Bonge Refinery which would be commissioned in 1976. The cost of dismantling and installing it that Bongaigaon would be Rs. 25.00 lakhs."

6.31. The Committee regret to note that the Kerosene Treating Unit II which was set up at a cost of Rs. 1.24 crores in December, 1965 was practically idle since its commissioning except for 93 days in 1968-69 and 80 days in 1969-70 when kerosene Treating Unit I was shut down. Government, however, expected that this could be utilised when Atmospheric Unit III went on stream. Even after Atmospheric Unit III started processing imported crude, Kerosene Treating Unit II could not be operated as the kerosene obtained from the Middle East did not require sulphur dioxide extraction. It has now been decided to utilise Kerosene Treating Unit II in the Bongaigaon Refinery which is expected to be commissioned by 1976 and the cost of dismantling and installing the unit at Bongaigaon Refinery would be Rs. 25 lakhs.

6.32. The Committee feel perturbed that the Kerosene Treating Unit II was set up at a cost of Rs. 1.24 crores without proper planning and without a proper assessment of the feed stock that would be available for processing thus resulting in unnecessary locking up of capital for almost 11 years till the Bongaigaon refinery would be commissioned.

The Committee recommend that this matter should be thoroughly investigated with a view to fixing responsibility for the huge loss suffered by the Refinery.

6.33. The Committee also find that though the Kerosene Treating Unit I was stated to have an in-built capacity over the above its designed capacity its utilisation was only of the order of 68.7 per cent and 75.6 per cent during 1966-67 and 1968-69 respectively. The utilisation during 1969-70 to 1972-73, however, ranged from 106 per cent to 132 per cent. The utilisation in 1970-71 was as high as 132 per cent. The Committee desire that the actual in-built capacity of the Union should be properly assessed so as to enable the Refinery to utilise it to the maximum and to correctly evaluate the performance.

D. Production Performance—Coking Unit

6.34. This Unit was commissioned on the 7th October, 1964. Within a short time, it was apparent that it would not be possible to produce furnace oil in accordance with specifications laid down in the Detailed Project Report. The result was that the off-specification furnace oil component produced at the Unit accumulated to the maximum of storage capa-

city available and brought the Refinery operations to a stand-still in December, 1964. It was found that both the quality and quantity of furnace oil component (coker fuel oil cut) obtained from the Coking Unit differed considerably from that given in the Detailed Project Report, thus aggravating the situation and making it impossible to dispose of all the Coking Unit products as to produce on specification finished products.

6.35. The difficulties in the operation of the Coking Unit at its desigend capacity of 2,000 tonnes per day (6,00,000 tonnes per year), the production of finished products according to the specifications given in the Detailed Project Report and the consequent effect on the operation of the Refinery as a whole were discussed by the Committee on Public Undertakings in paragraphs 88-95 of their Thirty Sixth Report (Third Lok Sabha—March, 1967).

6.36. The Committee on Public Undertakings (1966-67) expressed their distress to note the failure of the Indian authorities in having accepted the Detailed Project Report which very clearly indicated that furnace oil of Indian specification could not be produced in the Coking Unit.

6.37. On the recommendations of the Russian collaborators major modifications in the Unit were carried out during November-December, 1966 at a cost of Rs. 44.2 lakhs (exclusive of free replacements of the value of Rs. 6.6 lakhs by the Russians) with a view to operate the Unit at the designed throughout and to obtain on-specification marketable products.

6.38. The total feed stock processed during 1966-67 to 1969-70 was 3.34 lakh tonnes, 5.63 lakh tonnes, 5.90 lakh tonnes and 6.87 lakh tonnes respectively. The shortfall in the feed stock processed during 1967-68 has been attributed to teething troubles after the completion of the major modifications.

6.39. The loss due to shortfall in the actual yield as against the product yield as per the Detailed Project Report amounted to Rs. 28.01 lakh during 1966-67 to 1969-70.

6.40. The Management stated (July, 1971) as follows:—

(i) The designed materials balance indicated by the Russians at the time of supplying the final data for modifications and supplementary equipments pertained to the heater outlet temperature of 510°C. It was, however, considered prudent to operate the coking plant at a lower severitv and the heater outlet temperature has been maintained around 505°C—506°C resulting in the difference in yield. The operation at low temperature was resorted to safeguard against unplanned shut-downs and possibility of non-availability of imported equipment for repairs, keeping also in view the very tight material requirement of products all the time in the country.

(ii) ".....Under low severity operation, gas production comes down which enables corresponding amount of higher consumption of reduced crude for internal use. Since the reduced crude production was the determining factor for the refinery crude intake, low severity operation and low gas make means higher crude intake, for the refinery."

6.41. In April, 1972 it was however confirmed by the Ministry that the Coking Unit had been operated at 510°C without any difficulty with respect to the equipment. Thus the main reason for operating this Coking Plant at lower severity was the anxiety of the Management to restrict the production of gas so as to ensure higher consumption of reduced crude as fuel which otherwise posed a disposal problem. Even the reduced quantity of gas produced was not being fully utilised as fuel resulting in huge loss to the Refinery.

6.42. During evidence the Committee enquired about the additional loss being incurred by the Refinery as a result of restricting the production of gas which would otherwise have been used as fuel. They also enquired about the steps taken to ensure disposal of reduced crude otherwise than as fuel so as to enable the Coking Unit to operate at full severity and thereby achieve full economics as envisaged in the design manual. The Management stated as follows:—

"In the past, due to the problem of the disposal of the residue, we had to flare gas. But, during the last three years, this problem has not arisen, because, production of the residue has come down substantially. This is because of certain reasons. Firstly, we have increased the production of gas oil. Secondly, the phenol extract, which was previously going to the coking unit is not going now. We have got a market. We are now selling at the rate of about 45,000 tonnes per year of this extract for the production of carbon block. Lubricating oil plant is now running at rated capacity and on the top of that, off-take for the low sulphur residue has also gone up, because, the steel industry is now using low sulphur fuel for steel production. For all these reasons, now, the residue disposal is not a problem and the flaring which was being done a few years back—some three years before is no longer being done."

6.43. Asked whether it was not being flared at all, it was stated that they were doing normal flaring which any Refinery had to do. This had been reduced to the minimum extent.

6.44. The feed stock processed during 1970-71 to 1972-73 was 6.78 lakh tonnes, 6.33 lakh tonnes and 6.19 lakh tonnes respectively. During

these years the actual product yield as compared to modified designed has resulted in a gain as indicated below:—

1970-71	(+) Rs. 23.75 lakhs
1971-72	(+) Rs. 31.17 lakhs
1972-73	(+) Rs. 15.17 lakhs

6.45. The processing loss during 1972-73 was 3.3 per cent which is considered to be high. The loss is mainly because of the following factors:—

(i) the number of interruptions in Coking Unit was more as compared to previous years giving rise to more loss.

(ii) During November 1971 to January 1973 the gasoline intermediate tank was under repair and maintenance as a result ot which these tanks were by-passed and the product was sent directly to main storage tank along with other streams. There was, therefore, a difficulty of assessing the actual quantity of coker gasoline taken into the main storage tank which was receiving other streams also. Consequently, the correct material balance of the unit could not be worked out leading to exhibition of higher processing loss of the unit.

6.46. The Committee find that after commissioning of the Coking Unit of the Barauni Refinery in October, 1964 it was discovered that it was not possible to produce furnace oil of the specifications laid down in the Detailed Project Report as a result of which major modifications had to be carried out in November-December, 1966 at a cost of Rs. 44.23 lakhs. Even after the modifications, there has been considerable shortfall in the actual yield as against the product yield envisaged in the Detailed Project Report. The loss due to shortfall amounted to Rs. 28 lakhs during 1966-67 to 1969-70. The Unit had to be operated at lower severity in order to restrict the production of gas so as to ensure higher consumption of reduced crude as fuel which otherwise posed a disposal problem. Even the reduced quantity of gas produced could not be utilised as fuel resulting in considerable loss to the Refinery.

6.47. The Committee feel that market facilities for reduced crude should have been developed in time so as to synchronise with production and thereby the huge loss to the Refinery avoided.

6.48. The Committee would like corporation to make sure hat gas and other by-products arising in this Plant were put to maximum productive use and that the gas flared was absolutely unavoidable.

E. Production performance—Lube Oil complex

6.49. The Lube Oil Complex consists of 3 units, Phenol Extraction Unit, Dewaxing Unit and the Contact Filtration Unit.

6.50. The table below indicates the total designed capacity of the 3 units and the actual production during 1967-68 to 1972-73:—

Year	Designed capacity (Tonnes)	Actual production (Tonnes)	Percentage of actuals to designed capacity
1967-68 .	46,000	1,791	11·3
1968-69 .	46,000	12,938	28·1
1969-70 . . .	46,000	31,715	68.9
1970-71 .	46,000	47,699	103·7
1971-72 .	46,000	47,154	102·5
1972-73 .	46,000	49,263	107·1

6.51. The non-utilisation of the installed capacity upto 1969-70 was due to the fact that the lube oil produced could not meet the specification of the products which were in greater demand. As a result, production of 800 pale lube oil was taken up in March 1969, as a measure of diversification.

6.52. The loss incurred due to under utilisation of lube oil complex during the period 1967-68 to 1969-70 is about Rs. 50 lakhs as detailed below:—

Year	As per design	Achievable target	Actual performance of I.O.C.	Shortfall	Loss of Under-utilisation
					Rs. in Lakhs
1967-68 .	15300	9180	7604	1576	0·77
1968-69 .	46000	30667	10710	19957	27·35
1969-70 . . .	46000	39866	31523	8343	22·35

6.53. In working out the achieveable target in column 3 of the table above it has been assumed that in the first year of operation 60 per cent, second year 80 per cent, third year and onward 100 per cent are the

achievable targets. Since 1970-71 the Lube Complex has achieved production more than the designed capacity.

Idle Facilities

6.54. The Refinery was equipped with the compounding facilities for base stock of lubricating oils and additives at a cost of Rs. 29.61 lakhs. It was, however, decided in August, 1966 that the Refinery would not take up additive blending and the Marketing Division would lift the base stocks for Lubricating Oils for further additive blending at their blending stations. As a result, these facilities have not been utilised since the date of installation.

6.55. The Ministry stated (March, 1972) as follows:—

"Originally the Refinery was designed to produce four lube based stocks but because of certain operational difficulties and due to increase in the production of similar oils in the Digboi Refinery, only one grade of base stock is being produced. As a result the question of blending does not arise unless some additional stocks are brought to Barauni from other areas such as Madras and Calcutta. This would have necessitated the provision of empty drums for packing the finished products and their re-transportation to places around Calcutta where the market exists which was not considered economical."

6.56. In a written reply the Ministry have now stated that:—

"Out of the total investment of Rs. 29.6 lakhs on the additive blending facilities, equipment worth Rs. 19.2 lakhs has already been utilised. Since these facilities were not required in view of the additive blending not being necessary they are being used at the moment for handling phenol extract, slack wax and rubber processing oil."

6.57. During evidence the representatives of the Ministry explained the position with regard to the working of the Lube Oil Complex as follows:—

"When the Plant went into operation, it was found that it was not possible to produce all the 4 grades of oil because of the defects in the crude vacuum unit of the Refinery. This vacuum section was not operating because the vacuum was fluctuating and also it was found that the design of the crude distillation unit was somewhat defective and certain additions

were required. This matter was discussed with the Soviet Experts who came down for the purpose and after considerable discussions it was found feasible to put this defective design right which will cost a lot of money and also a long period of shut down. We also talked about this to the Marketing Division who told us that these 4 grades of oils which we are planning to produce were low quality oils and we might find difficulty in marketing them."

6.58. Asked whether this difficulty was not envisaged before putting up the plant, it was stated as under:—

"We knew that in a very total way and not the various grades at that time. The only people who were marketing the lubricating oils in the country at that time were the private refineries. There was no Indian Oil Corporation and there was no information about the marketing of this oils at all. So, when we failed to produce 4 grades of crude oils-- and these 4 grades were not at all satisfactory—it was decided to concentrate on only one grade."

6.59. The Committee note that, though the Lube Oil Complex of the Barauni Refinery was originally designed to produce four Lube base stocks, it was not possible to produce all the 4 grades of oil because of defects in the crude vacuum unit due to defective design and certain additions were required in the plant. Consequently, the plant remained under-utilised from 1967-68 to 1969-70 resulting in a loss of about Rs. 50 lakhs during this period. The Committee were informed that rectification of defects was carried out as it involved a huge amount of money and a long period of shut down. What is more surprising is the fact that the Corporation discovered later that the 4 grades of oils planned to be produced were low grade oils and could not meet the specifications of the products which were in demand in the market. It was also found that Digboi Refinery had increased the production of oils which could meet the market demand. As a measure of diversification, the Corporation took up production of 800 pale lube oil in March, 1969. Since 1970-71, the lube complex has achieved production more than the designed capacity.

6.60. The Committee also regret to note that the compounding facilities for base stock of lubricating oil and additives created at a cost of Rs. 29 lakhs remained under-utilised as only one grade of oil was being produced which did not require blending. It has been stated that the equipments worth Rs. 19 lakhs are being utilised for handling phenol extract, slack wax and rubber processing oil.

6.61. The Committee take a serious view of this huge loss due to under-utilisation of the Plant and the non-utilisation of facilities which in their opinion could have been avoided if the Complex had been created after a detailed market survey of the demand for products and proper planning. The Committee recommend that the matter should be thoroughly investigated in order to fix responsibility for this serious lapse, and to devise suitable measures to ensure that such costly lapses do not recur.

F. Bitumen Unit

6.62. The Unit was commissioned on 7th November, 1966, at a capital cost of Rs. 1.06 crores. During the trial runs conducted between November, 1966 and March, 1967 it was established that it was not possible to produce bitumen of the specifications envisaged in the Project Report. Trial production of Bitumen 80—100 grade by straight oxidation of phenol extract was made in February, 1968 which met ISI specifications. As the production under this process was not economical the unit was closed in March, 1968 for major modifications which were completed at a cost of Rs. 4.10 lakhs.

6.63. After completion of the first stage of modifications, the Unit was again put on circulation on 28th April, 1968 and during test runs conducted between 11th May, 1968 and 2nd July, 1968 various grades of bitumen conforming to ISI specifications were produced. These were, however, found unsuitable for road surfacing.

6.64. The problem was reviewed on 5th July, 1968 in a meeting attended by the Soviet Specialists, scientists from the Central Road Research Institute and the representatives of the Company and it was felt that 60—70 grade bitumen was not suitable for road work in plains but could be used at an altitude of 4000—6000 ft. provided the temperature was between 5° and 35°C. It was also agreed that the Soviet Specialists would conduct further tests to improve the viscosity of bitumen and the plant would have to be shut-down pending further development in technology.

6.65. On the basis of further laboratory tests done in July, 1968, the Soviet specialists produced a sample of A-35 grade bitumen which met the application viscosity and penetration ratio, but the production of this grade of bitumen was found uneconomical.

6.66. During the intermittent operation of the Unit (between November 1966 and July, 1968) a quantity of 4,180 tonnes of bitumen (including 840 tonnes of 80—100 grade) was produced. The unit was closed on 8th

July, 1968 and has not been restarted so far. The restricted operation of the Unit has resulted in a loss of Rs. 60 lakhs (excluding the expenses of the initial period of commissioning and trial runs up to the end of 1966-67) Besides, the fixed and variable expenses during 1969-70 to 1972-73 when the Unit was completely idle amounted to Rs. 46 lakhs.

6.67. With regard to the idle capacity in the Bitumen Unit, the Management stated as follows:—

> "Soon after production commenced it was discovered from the experience of the users that bitumen was not suitable for road work in plains. This fact was not known earlier either to the Soviet specialists or to IRL or even to the ISI. Further investigational work revealed that bitumen suitable for plains could not be manufactured from the Naharkatiya type of feed stocks. The plant has, therefore, remained unutilised."

6.68. During evidence the Managing Director explained the position as noted under:—

> "This is an unfortunate story, but we will have to live with it. When the crude was supplied, the Russians found that they could make the bitumen as per the ISI specifications. The ISI Specifications for bitumen was normally based on the bitumen being used in the country which was produced mainly from the Middle East crude. ISI specifications was mainly based on our previous experience. But one particular specification was not mentioned because it was not considered necessary at all. That means, bitumen, when it is heated up to higher temperature, softens above certain temperature. This particular type of crude in Assam has got very high wax. Because of this property, if the temperature fluctuation takes place, this bitumen produced from Assam crude becomes more soft than the other. The bitumen from Middle East crude and Assam Crude used at a particular temperature has got certain hardness but if it increases, the bitumen from Assam Crude becomes much more soft than the other one. This property was not mentioned in the ISI specifications. This is the main problem. In our country the temperature fluctuation is very high and this type of bitumen could not be used."

It was further stated as follows:—

> "But the question comes, how it is disposed off by Assam Oil Company. Assam Oil Company is making some bitumen and they are using it at higher altitude, whether the temperature

and its range is low. Then the question will be raised, why we have not produced bitumen and use it at higher altitude. On further investigation we have found that the Assam Company is making bitumen only from certain specific wells, where this property 'wax' is less and ash phaltine is more. They cannot make in general from all types of crude even in Assam. This is the problem.

We have also contacted the Assam Oil Company. They have addressed a letter to the Ministry. They have told the Ministry that they cannot make more bitumen because from the crude which they are getting the bitumen is going down. This shows that the bitumen which the Assam Oil Company are making is from certain specific wells."

6.69. The Committee enquired whether proper investigations were not made before making provision in the Project Report to find out whether bitumen suitable for plains could be produced from Naharkatiya feed stock. In a written reply the Ministry have stated that:—

"Since the specifications laid down by ISI cover the requirements of bitumen for application at all areas whether plains or hills, there was no reason to consider that bitumen suitable for plains cannot be produced from Naharkatiya feed stock. It was felt then that so long as the bitumen met the ISI specification it would be suitable for application in the plains."

6.70. The Committee enquired whether the ISI were consulted before laying down the specifications for bitumen to be produced at Barauni. It has been stated that "the plant was designed taking into account the ISI specifications. Since their specifications were available, there was no need to make a reference to the ISI unless certain problems were encountered in the implementation of these standards."

6.71. Asked whether the National Research Laboratories like the Central Road Research Institute were consulted in the matter, it was stated that "since the project envisaged producing bitumen meeting the ISI specifications there was no need to consult the Central Road Research Institute. Normally these institutes are consulted only if some difficulties are expected or actually met with. In this case these institutes were consulted after the bitumen produced was found not suitable when applied on the roads."

6.72. The Committee enquired whether the possibility of producing bitumen of 60—70 grade was considered at least to meet the requirement

of road construction work at the specific heights. It was stated as follows:—

> "The possibility of producing bitumen of 60—70 grade was considered; but much of the demand for its grade for use at specific height were being met by the Digboi refinery and demand for application in the heights was not sufficiently large to justify the manufacture of this grade in Barauni refinery."

G. Economics of the Production of Bitumen

6.73. According to the original Project design, the surplus L.S.H.S. (Low Sulphur Heavy Stock) was to be processed in this Unit which would have meant additional throughput of crude oil in Atmospheric Vacuum Units. The economics of the manufacture of bitumen, however, completely changed due to (a) considerable fall in its sale price and (b) removal/overcoming of the bottleneck of the Coking Unit due to which considerable quantity of L.S.H.S. was being thrown as surplus. The net back to the Refinery from processing the same feed in the Bitumen Unit and the Coking Unit has been assessed at Rs. 110 and Rs. 121 per tonne respectively. Besides, the operating cost of the Bitumen Unit is Rs. 24 per tonne as against the marginal cost of about Rs. 11.50 per tonne for processing the feed in the Coking Unit. It is, therefore, evident that so long as there is spare capacity in the Coking Unit, the manufacture of bitumen would always be a losing proposition. In June, 1970 the Refinery Authorities assessed that even the operation of the Unit at its rated capacity would now result in loss of Rs. 30 lakhs per annum.

6.74. During evidence, the Committee enquired whether the economics of processing the feed stock in the Bitumen unit had been worked out before making provision in the Project Report for a Bitumen Plant. The Managing Director stated as follows:—

> "The economics of cost was worked out at that time and there is no doubt that Bitumen plant would have been much economical, if we could produce the right type and quality and if we could sell it. The price was definitely higher than the residue price. But, unfortunately, we could not produce it."

H. Fabrication of Drums

6.75. The Barauni Refinery was expected to start the production of bitumen in October/November, 1966. Accordingly, orders were placed on fabricators for the supply of 3 lakh drums on 22nd December, 1966.

6.76. As there was scarcity of drum sheets in the home market, 3000 tonnes of drum sheets were imported during March, 1967 and July, 1967,

a quantity of 1026 tonnes of indigenous sheets were also purchased. These sheets were supplied to the fabricators.

6.77. As the production of bitumen, did not come up as anticipated, the order for the supply of drums was, therefore, kept in abeyance. It was stated by the management in a written note that, in order to avoid deterioration of the quality of steel approval of the Board of Directors was obtained in August, 1966 for disposed of approximately 2000 M.T. of Steel after keeping 1000 M.T. of imported steel needed for their own requirements. The steel was disposed of on the basis of public tenders and with due permission of Iron and Steel Controller as follows:—

Quantity	Date of Disposal	Remarks
1900 (Imp)	Aug. 1968	Loss Rs. 2·71 Lakhs
500 "	Feb. 1969 (Loan to (CRL)	Returned and used in the Refinery
30 "	Aug. 1968	Sold to Rehabilitation industries corporation at Book Value.
570 "	—	Used in the Refinery in June/Sept. 1969.
3000 "		

6.78. As regards indigenous steel, it was disposed of/utilised as follows:—

(a) 1004·5 MT	Used in the Refinery during February-March 1967 to July 1969.
(b) 21·5 MT .	Sold to a barrel fabricator in March 1969 at the approved marked rate.
1026. OMT	

6.79. The Company also incurred a loss of Rs. 7.12 lakhs upto 31st December, 1971 by way of interest charges (Rs. 5.74 lakhs) and godown rent (Rs. 1.38 lakhs).

6.80. The Management stated (July, 1971) that ". . . . . In view of the unusual nature of the difficulties faced by us no planning connected with bitumen could be sustained."

I. Utilisation of the Bitumen Unit

6.81. After making some minor modifications and changes in the bitumen unit, the present plan is to restart the unit using residue from imported crude. The experience in other Refineries is that Bitumen produced from Middle East crude oil meeting ISI specifications is perfectly suitable for application in India in plains as well as high altitudes.

6.82. The Management have intimated the economics of operating the Bitumen Unit with the help of feed stock available from imported crude.

It was stated that the capacity of the unit would be one lakh tonnes per year as against 1,07,000 tonnes indicated in the Project Report and an additional investment of Rs. 40 lakhs would be required. The net margin, after taking into account incremental expenses was expected to be Rs. 2.33 lakhs. It has been stated that the work of revamping/modifications of the bitumen unit will be carried out simultaneously alongwith the revamping jobs of the Barauni Refinery Phase I. These jobs are expected to be completed by 1975.

6.83. The Committee regret to note that the Bitumen Unit of the Barauni Refinery was set up in November, 1966 at capital cost of Rs. 1 crore, without proper investigation whether bitumen suitable for plains could be produced from Naharkatiya feed stock. Neither the Indian Standards Institute nor the Central Road Research Institute were consulted in the matter. The Committee are surprised that the ISI specifications already available for producing bitumen with Middle East crude were blindly adopted as a guide for producing bitumen from Assam crude. The result was that the unit remained idle/under-utilised since its inception. Even after carrying out modifications in 1968 at a cost of about Rs. 4 lakhs, the Unit could not be started as it could not produce bitumen suitable for road work in plains. Efforts to produce bitumen of grades other than those envisaged in the Project Report could also not succeed as production of bitumen of these grades proved to be uneconomical. The restricted/non-operation of the Unit resulted in a loss of about Rs. 1 crore. The economics of producing bitumen in the Barauni Refinery also indicated that so long as there is spare capacity in the Coking Unit, the manufacture of bitumen would always be a losing proposition. The operation of the Unit even at its rated capacity would result in a net loss of Rs. 30 lakhs per annum. The Committee take a serious view of the defective planning in the setting up of this Unit.

6.84. The Committee also find that the Corporation imported 3,000 tonnes of drum sheets and purchased 1,026 tonnes of indigenous sheets for the fabrication of drums for bitumen. The Committee regret to observe that as the production of bitumen did not come up as anticipated, the fabrication of drums had to be kept in abeyance and 1,900 tonnes of imported sheets had to be disposed of after about one year from the date of its purchase at a loss of Rs. 2.71 lakhs. The Corporation had also to incur a further loss of Rs. 7.12 lakhs upto 31st December, 1971 by way of interest charges and godown charges.

6.85. The Committee are informed that it is now proposed to restart the Unit using residues from imported crude after carrying out modifications at a cost of Rs. 40 lakhs which are likely to be completed by 1975. The Committee are surprised that modification would result in reduction of the existing capacity, though it is claimed that the margin of profit

would be Rs. 2.33 lakhs. The Committee are not sure whether these economics of the Project would be realised particularly in the context of increase in the price of imported crude. The Committee would like Government to closely examine the economics of the proposed conversion to ensure that it is in the best interest of the Corporation and larger public interest before investing any further amounts.

6.86. The Committee recommend that the entire matter regarding the setting up of Bitumen Unit at Barauni Refinery should be investigated by a high level Committee in order to pin point the lapses and fix responsibility for the huge loss suffered by the Corporation.

6.87. The Committee would like to be informed of the concrete measures taken to obviate recurrence of such costly lapses in investment and tying up of collaboration arrangements.

J. Coke Calcination Plant

6.88. With a view to meet the requirement of calcined coke in this country and to increase the profitability of the Refinery, the Government of India sanctioned on 27th June, 1967 the installation of a Coke Calcination Plant at Barauni. An agreement was entered into with M/s. Engineers India Ltd.—another Government Undertaking, on 5th July, 1968 for the design, engineering, supply, erection and commissioning of the plant at a total cost of Rs. 55.70 lakhs (including foreign exchange component of Rs. 3.65 lakhs). The plant was scheduled to be completed on 6th May, 1970 but was put on trial runs in the middle of 1971 when some operational problems and equipment failures were noticed. After modifications/repairs the plant was restarted for test runs in November, 1971 but had to be shut down after about a week due to difficulty in operating the bagging and stitching section to the designed capacity and defects in equipment and instruments. The unit was again started in January, 1972 but was shut down as the refractory line of the burner started falling.

6.89. The plant was finally taken over from Engineers India Ltd. on 28th June, 1972. The total expenditure upto March, 1973 was Rs. 62.20 lakhs.

6.90. As regards the effect of delay in completion of this plant on the overall operation/profitability of the refinery the Ministry have stated in a written reply as follows :—

> "The profitability of the refinery was reduced by about Rs. 70 lakhs due to delay in completion. This related to the value of loss of non-production of about 31,600 tonnes of calcined coke due to delay in the completion of this project. The

Refinery suffered a further loss of about Rs. 27 lakhs due to shortfall in production during the period July, 1971 to February, 1972 on account of malfunctioning of the equipments. The shortfall during this period was estimated at 12,600 tonnes of calcined coke."

6.91. During evidence, the Committee enquired about the reasons for delay in the completion of the Unit, the Managing Director, IOC stated as follows:—

"It is true that there has been a delay in the completion of the plant by about 1½ years. This plant has been designed and built by Engineers India Limited, a public sector undertaking. Out of this 1½ years delay, the delay of one year was beyond their control because of the strike that was going on in the plants where their equipments were being manufactured. Once it was commissioned, there was some problem or defect, because of which, the plant was down again for six months."

6.92. Asked whether there was any penalty clause in the agreement with M/s. Engineers India Limited, it was stated there was no penalty clause, since it is also a public undertaking. But it was agreed that if there is any dispute, it will be referred to the Ministry of Petroleum and Chemicals for settlement.

6.93. About the present utilisation of coke calcination unit it was stated as follows:—

"The coke calcination unit has gone on regular production; but, not at full rated capacity. The plant was designed for 60,000 tonnes of oil coke. Last year (1972) we did about 52 per cent. The reason for this low capacity was that, we did not have enough market last year. This is because, calcinated petroleum coke is mainly used by the aluminium industry and there was a power crisis. So, the aluminium industry was not in a position to use much of this coke."

6.94. The Committee find that M/s. Engineers India Ltd. were entrusted with the task of design, engineering, erection and commissioning of the Coke Calcination Plant at Barauni Refinery at a total cost of Rs. 55.70 lakhs. The Plant was scheduled to be completed by 6th May, 1970. It was, however, finally made over to IOC in June, 1972 after a delay of two years. The delay of one year was stated to be due to strike in the plants where M/s. Engineers India Ltd. were getting the equipments manufactured. Another one year was taken in rectification of the defects noticed after the trial runs of the plant. The Committee are surprised to

find that the agreement with M/s. Engineers India Ltd., did not even contain provision for levy of penalty for delay in completion of work. The Committee are informed that consequent on the delay the cost of the plant went up by Rs. 6.50 lakhs and the profitability was reduced by about Rs. 70 lakhs due to delay in the completion and commissioning of the Plant and of a further amount of 27 lakhs due to shortfall in production during July, 1971 to February, 1972, on account of malfunctioning of the plant.

6.95. The Committee recommend that the reasons for delay in the completion of the plant and its defective working after commissioning should be thoroughly investigated so as to pinpoint lapses and in order to fix responsibility for the huge loss.

K. Sale of Raw Petroleum Coke

6.96. On 21st April, 1966 an agreement was entered into with M/s. India Carbon Limited, Gauhati for a period of five years for sale of the following quantities of raw petroleum coke produced at the Barauni Refinery:—

1966	16,000	tonnes
1967	36,000	tonnes
1968	20,000	tonnes
1969	10,000	tonnes
1970	10,000	tonnes

6.97. The production of petroleum coke at the Refinery during the years 1966-67, 1967-68, 1968-69 and 1969-70 was 37,239 tonnes, 65,263 tonnes, 71,647 tonnes and 90,159 tonnes respectively. But the agreement for the sale of lesser quantities as mentioned above was made on account of the fact that the coke calcination plant with a capacity of about 60,000 tonnes per annum was proposed to be set up and that the plant was expected to be completed within 2 years from the date of its sanction by the Government. The sanction was accorded in June, 1967 but the plant commenced production in June, 1972.

6.98. In a written note the Management have, however, stated that besides India Carbon Ltd., raw petroleum coke from Barauni was also being sold to other consumers like carbide, aluminium manufacturers etc.

6.99. The table below indicates the production and despatches of raw petroleum coke during the years 1966-67 to 1972-73:—

Year	Production	Despatches
1966-67	37,239	28,057
1967-68	65,263	76,624
1968-69	71,647	81,672
1969-70	90,159	89,326
1970-71	98,961	58,439
1971-72	80,677*	98,779
1972-73	58,035*	69,165

*Excludes 8045 MT and 31330 MT of raw petroleum coke transferred to Coke Calcination Unit during 1971-72 and 1972-73 respectively.

6.100. During evidence the Committee enquired whether the price charged was uniform for the various parties to whom raw petroleum coke was being sold. The representative of IOC stated that "it was not the same for all. The reason was that we had to sell it at a lower price. It was distress sale because we did not have coke calcination unit. It was piled up in the refinery. That is why in the case of some parties, it had to be lowered."

6.101. About the production of raw petroleum coke in excess of the quantity required it was stated as folows:—

> "Our production of raw coke in the Barauni Refinery is about 90,000 tonnes and the capacity of the calcination unit is 60,000 tonnes. There is some surplus to be disposed off. Secondly, we had accumulated coke to the extent of 80,000 tonnes which had also to be disposed off."

6.102. About the fixation of price of raw petroleum coke the Management informed the Committee that the sale of Raw Petroleum Coke ex-Barauni Refinery to the general trade commenced from the 3rd quarter of 1964. Initially raw petroleum coke was marketed in three grades and the prices were as under:—

O. to 8 mm :	Rs. 130 MT	Exclusive of bagging charges, duties taxes etc.
Above 8 up to 25 mm :	Rs. 150 MT	exclusive to bagging charges, duties taxes etc.
Above 25 to 150 mm:	Rs. 160 MT	exclusive of bagging charges duties taxes etc.

6.103 In the beginning there was a very limited market and in view of the inability of the Corporation to sell adequate quantities of raw petroleum coke, the aforesaid prices had to be slashed down to Rs. 105/MT. Rs. 130/MT and Rs. 140/MT respectively the market of raw petroleum coke to the general trade was limited to the extent of 1000 MT per month supplied to calcium carbide and other miscellaneous industries. The only alternative for the disposal of huge stocks of raw petroleum coke accumulating in the Barauni Refinery at that time were—(i) export and (ii) India Carbon Ltd. India Carbon Ltd. had a calcination plant at Gauhati and were capable of uplifting huge quantities of raw petroleum coke to the extent of 3,000/4,000 metric tonnes per month. Towards the end of 1965, an approach was made to India Carbon Ltd. for the sale of bulk quantities of raw petroleum coke ex-Barauni on an *ad hoc* basis as well as avenues for exporting raw petroleum coke were explored. The export offer made by Messrs. Capexil Agencies Pvt. Ltd., Calcutta at that time was only for Rs. 50 MT F.O.R. Barauni and another export offer was for a net back as low as Rs. 36 MT F.O.R. Barauni. Therefore, in the absence of attractive export offers in order to dispose of huge stocks of raw petroleum coke accumulated in the Refinery, it was decided to enter into an agreement with India Carbon Ltd. for the sale of huge quantities of raw petroleum coke. When the question of price arose, M/s. India Carbon Ltd. wanted the supply of raw petroleum coke ex-Barauni at a price which could match the price of raw petroleum coke at their plant from Gauhati, such a price worked out to about Rs. 80 M.T. F.O.R. Barauni as shown below:—

The then obtaining price of Raw Petroleum Coke ex-Gauhati	Rs.	124/— MT
Less Railway freight from Barauni to Gauhati	Rs.	39.08/— MT
Less 5% moisture rebate	Rs.	4.25/— MT
		80.67/— MT

say Rs. 80/— MT

6.104. An agreement was entered into with India Carbon Ltd. for the sale of 92,000 MT's as per details given below:—

1966-16,000 MT-Rs. 80/— MT
1967- 36,000 MT Rs.80/— MT
1968-20,000 MT-Rs.80/— MT

MT Plus 50% applicable railway freight between Gauhati and Barauni. Approximate railway freight between Gauhati and Barauni was about Rs. 40/—MT. Aforesaid Price applicable for supplies despatched on freight to pay basis.

1969-10,000 MT-Rs. 80/— MT -do-

1970-10,000 MT-Rs. 80/— MT -do-

6.105. A further contract was executed with India Carbon Ltd. on 12th July, 1967 for supply of 30,000 MTs of raw petroleum coke at the rate of Rs. 80 per MT F.O.R. Barauni plus 50 per cent railway freight plus other taxes to be borne by India Carbon Ltd.

6.106. The exports of raw petroleum coke arranged during 1966, 1967 and 1968 through State Trading Corporation and private parties ex-Barauni are as follows:—

Year	Quantity	Rate	Remarks
1966	4,400	Rs. 93.33/—MT for Barauni	
1967	30,000	Rs. 80/—MT for Barauni	Out of this, for 15,000MT the Refinery got a net back of Rs. 63/—MT F.O.R. Barauni from M/s. Capexil Agencies.
1968	10,600	Rs. 80/— MT For Barauni	

6.107. From November 1968 onwards the price applicable to India Carbon Ltd. was the same as the price applicable to general trade. The price of raw petroleum coke from November, 1968 was as follows:—

November 1968	—Rs. 120/—	MT	F.O.R	Barauni
1.10.1969	—Rs. 165/—			—do—
4.8.1971	—Rs. 195/—			—do—
1.8.1973	—Rs. 260/—			—do—

6.108. During evidence the Chairman, IOC stated as follows:—

> "Earlier, when we started depending on availability and demands from various people from time to time, we had to offer it at different rates; but now, a uniform price has been fixed for this product and it is made available to all at the same price. But there is another problem. We have no long-term arrangements now, because we ourselves cannot supply large quantities, as and when the demands for the calcined coke picks up and our own plant picks up, substantial quantities will be calcined. Today we ensure that if there is to be any increase in the price of crude oil, even within two or three months, it will be reflected in refinery price of raw coke."

6.109. The Committee note that the Barauni Refinery had to make a distress sale of Raw Petroleum coke at a price of Rs. 80 per metric tonne to dispose of the large accumulated stock in the Refinery and no alternate adequate market for the same could be found. The agreement entered into with M/s. India Carbon for a period of five years in 1966 was for the sale of lesser quantities of petroleum coke than what was produced.

The Committee were informed that this was on account of the fact that the Coke Calcination Plant with a capacity of 60,000 tonnes per annum was proposed to be set up in the Barauni Refinery and to be completed in June, 1969. The plant, however, commenced production in June, 1972.

6.110. The Committee regret to note that on the one hand, the Corporation failed to find adequate market for raw petroleum coke, on the other hand the completion and commissioning of the Coke Calcination Plant was delayed by about 3 years. The Committee have already commented earlier about the undue delay in the commissioning of the Coke Calcination Plant.

6.111. The Committee have also earlier commented about the sale of Raw Petroleum Coke to M/s. India Carbon Ltd. ex-Gauhati. They recommend that the distress sale of this product ex-Barauni and the total loss suffered by the Refinery as result of fixation of much lower price for the product should also be thoroughly investigated in order to pinpoint the lapses, if any.

6.112. The Committee also stress that Corporation should see that the price of raw petroleum coke should be fixed realistically keeping in view the current rise in price of crude and the latest demand for the product.

L. Operating Efficiency—Atmospheric Vacuum Unit I & II Atmospheric Unit III

6.113. According to the Project Report, each of the Atmospheric Vacuum Units I and II and Atmospheric Unit IIII is to operate for 330 days per annum.

The following table indicates the actual operating days in respect of each unit during 1966-67 to 1972-73:

Year	AVU-I		AVU-II		AVU-III	
	Actual operating days	Under shut-down/ repair/ maintenance/ idleness	Actual operating days	Under Shut down/ repair/ maintenance/ idleness	Actual operating days	Under shut down/ repair/ maintenance/ idleness
1966-67 .	328	37	130	235		
1967-68 .	302	64	326	40		
1968-69 .	330	35	298	67	11	52
1969-70 .	280·5	84·5	299·5	65·5	118·5	246.5
1970-71 .	360·5	4·5	351·5	13·5	..	365·0
1971-72 .	341·0	25·0	330·5	35·5	57·5	308·5
1972-73 . .	340·0	25·0	346·0	19·0	111·5	253·5

6.114. The following are the main reasons for the shutdown/repair/maintenance period being in excess of the designed period:—

(i) Bottlenecks in the downstream units, such as the Coking Unit, Lube Oil Complex and Bitument Unit.

(ii) The Atmospheric Vacuum Unit I was under shut down for 19 days during 1967-68 due to build up of high stock of M.S., S.K. and H.S.D. besides another 19 days in March, 1968 due to pollution of River Ganga.

In 1969-70, the increased period of shutdown was due to leak in the overhead condensors of K-2.

(iii) The AVU II was not operated for 154 days during 1966-67 as during the 1st stage operations of the Refinery it was found that the designed capacity of the Coking Unit was less and required extensive modifications. The Unit was also under shutdown for 51 days from 18th October, 1966 in order to build-up ullage for storage of reduced crude while carrying out modifications in the Coking Unit.

Less utilisation of the Unit during 1967-68 to 1969-70 was mainly due to shortage of feed stock and non-availability of space for reduced crude.

The Unit was also shutdown for 13 days in March, 1968 due to pollution of River Ganga.

(iv) Failure of equipment and utilities, the important one being the leak in the transfer line of AVU I resulting from deficiency in design. For vacuum sections, lines of bigger diameter were supplied free of cost by the Russian collaborators. As a further corrective measure, the transfer lines on the atmospheric side were replaced and also increased at a cost of Rs. 3.10 lakhs.

(v) AU III was operated for less number of days due to limited availability of crude and the limitations of product off-take.

6.115. The Committee find that according to the Project Report each of the Atmospheric Vacuum Units I and II and Atmospheric Unit III was to operate for 330 days per annum. The actual operating days during some of the years were much less than that provided in the Project Report. Atmospheric Vacuum Units I and II were under shutdown/repair/maintenance/idleness for 64 days and 40 days respectively during 1967-68, 35 days and 67 days respectively during 1968-69 and for 84 days and 65 days respectively during 1969-70. Bottlenecks in the downstream Units such as the Coking Unit, Lube Oil Complex and Bitumen Unit, failure of

equipment and utilities have been cited as the reasons for low level of responsibility for the loss.

6.116. The Committee regret to note that, due to deficiency in design in the transfer line of Atmospheric Unit I there was leakage and its replacement cost the Refinery Rs. 3.10 lakhs. The Committee recommend that the reasons for defect in design should be investigated in order to fix responsibility for the loss.

6.117. The Committee also recommend that the Central Service Organisation which has been formed in order to improve the service factor of the Refineries of IOC should go into the technical details in order to suggest measures to improve the operating efficiency of the Refinery.

6.118. The Committee further note that Atmospheric Unit III was operated for less number of days due to limited availability of crude. The Committee hope that with the processing of imported crude in the Barauni Refinery the operating efficiency of the Unit would improve.

M. Operating Efficiency—Kerosene Treating Unit I

6.119. The Unit was designed to operate for a period of 330 days in a year. The table below indicates the actual operating days during the seven years ending 31st March, 1973:—

Year	Actual Operating days	Under Inspection and maintenance	Idle
1966-67	290	22	53
1967-68	333	16	17
1968-69	192	39	134*
1969-70	303 1/2	32½	29
1970-71	359·5	5·5	
1971-72	314·0	52·0	
1972-73	300·0	65·0	

Note :1.

*Includes a period of 23 days when the unit was under circulations splitter operation.

2. A number of critical equipments from the Kerosene Treating unit II, which is lying idle were utilised to provide facilities for the treatment of A. T. F. to make it possible that it passes the silver strip test.

6.120. The period of inspection and maintenance/idleness was more except in 1967-68 and 1970-71 than that envisaged in the Project Report. The main reason for the plant remaining under maintenance/idle for long periods during 1968-69 were lack of feed stock and shortage of SO_2 The loss of revenue for each day of shut down was estimated at Rs. 10,000.

6.121. In regard to lack of feed stock it has been stated that the crude oil supply to Barauni Refinery remained suspended from 5th October to 20th October, 1968 due to damage to the crude oil pipeline because of floods in the Teesta river. As a result the distillation Unit had to be shut down and the feed stock for kerosene treating unit was not available.

6.122. About the low SO_2 inventory the management have furnished the following reasons:—

(1) In 1968 the SO_2 plant of the Fertilizer and Chemicals Travancore Ltd., the supplier of SO_2 to Barauni refinery remained shut-down from 10th April to 3rd May, 1968. Due to certain technical difficulties their plant could not go into full production till about middle of June, 1968.

(2) Moisture content of SO_2 production at FACT often exceeded the prescribed limit during this period, thereby resulting in further restrictions on supplies.

(3) Transportation difficulties and poor turn-round of cylinders due to the long lead between Barauni and FACT.

(4) Limited number of cyclinders which were put in service by FACT for SO2 supplies to us. All possible sources of supply were explored, but it was possible to get only small quantitie of SO2 from M/s. Excel Industries, Bombay, even after paying much higher price of Rs. 1500 per tonne as against Rs. 950 per tonne paid to FACT ex-Factory through the intervention of the Ministry of Petroleum and Chemicals, the FACT was persuaded to put more cylinders for IOC's service.

6.123. It had been added that "IOC had entered into long term arrangement with Associated Industries, Assam who had set up their plant at Gauhati for supply of SO2 to our two refineries. Their plant, after short operation period, on account of certain technical problems, was shut down in 1964. They were continuing their efforts to recommission it but they could not overcome the problems."

6.124. As regards the shut down during 1971-72 and 1972-73 the Management have stated as under:—

"The longest shut down from 24th February, 1972 to 26th April, 1972 for a period of 56 days—37 days falling in 1971-72 and

'19 days in 1972-73.' The shut down of the unit during 1971-72 was originally planned to be taken up sometime during September, 1971. This shut-down could not however be taken up as per plan due to the emergency conditions prevailing in the country then and to meet the demands of products for Defence needs. Since this shut-down was taken up after a long time the actual period of shut-down was also longer than the normal which is of the order of 20 days.

In the month of August, 1972 the unit had to be shut-down due to low inventory of SO2 and this shut-down was for 41 days. This together with the shut-down during April, 1972 indicated above were mainly responsible for less constream days during this year."

6.125. The loss of revenue for each day of shut down during the period has been estimated at Rs. 7000 approximately.

6.126. The Committee find that Kerosene Treating Unit I was designed to operate for a period of 330 days in a year. The operating efficiency in some of the years was extremely low. The Unit remained idle for 134 days and under inspection and maintenance for 39 days during the year 1968-69. Lack of feed stock and shortage of sulphur dioxide have been cited as the reasons for remaining under maintenance/idle for longer period. The loss of revenue for shut down has been estimated at Rs. 10,000 per day.

6.127. The Committee further note the Unit had to be shut down for 52 days and 65 days during 1971-72 and 1972-73 respectively. While the shut down during 1971-72 was longer due to delay in taking up maintenance on account of emergency conditions, the Committee find that law inventory of Sulphur dioxide was the main cause for the shut down for 41 days during 1972-73. The loss of revenue during the period has been estimated at Rs. 7000 per day.

6.128. The Committee fail to understand as to why the Corporation should not plan their requirement of sulphur dioxide well in advance and ensure the availability of adequate quantities thereof in time so that need for shut down due to shortage of sulphur dioxide and consequential loss of revenue is avoided. The Committee recommend that this matter should be gone into with a view to taking remedial action to avoid recurrence of such situations in future.

N. Operating Efficiency—Coking Unit

6.129. The table below indicates the actual operating days of the Unit as against the designed 300 days per annum during 1966-67 to 1972-73:—

Year	Actual operating days	Under shut-down maintenance/repairs
1966-67	237	128
1967-68	293	73
1968-69	329	36
1969-70	321·5	43·5
1970-71	331	34
1971-72	314	52
1972-73	316	49

6.130. The lesser number of operating days during 1966-67 were mainly due to the major modifications carried out during the year.

O. Processing Costs—Kerosene Treating Unit—I

6.131. The table below indicates the fixed and variable expenses per tonne of feed stock processed during the seven ended 31st March, years 1973:—

Iutake	1966-67		1967-68		1968-69		1969-70		1970-71		1971-72		1972-73	
	Tonnes 1,85,531		Tonnes 2,91,071		Tonnes 2,04,058		Tonnes 2,86,341		Tonnes 3,56,202		Tonnes 3,20,808		Tonnes 3,08,940	
	Value	Rs./t	Value	Rs/t	Value	Rs./t	Value	Rs/t	Value	Rs/t	Value	Rs/t	Value	Rs/t
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	(Rs. in lakhs)		(Rs. in lakhs)		(Rs. in lakhs)		(Rs. in lakhs)		(Rs. in lakhs)		(Rs. in lakhs)		(Rs. in lakhs)	
Variable expenses														
Chemicals	3·45	1·86	5·27	1·81	6·59	3·23	9·04	3·16	8·05	2·26	10·10	3·15	12·85	4·16
Utilities	29·42	15·86	31·90	10·96	24·56	12·03	33·84	11·82	21·53	6·04	27·93	8·71	24·85	8·04
Maintenance Stores	1·74	0·94	1·58	0·54	3·67	1·80	4·47	1·56	1·71	0·48	2·74	0·86	4·01	1·30
TOTAL	34·6	118·66	38·75	13·31	34·82	17·06	47·35	16·54	31·29	8·78	40·77	12·72	41·71	13·50
Fixed expenses														
Establishment	2·16		1·97		2·94		3·39		4·16		4·73		4·95	
Depreciation	14·61		14·62		12·37		12·23		12·25		12·25		12·27	
Interest	9·95		9·88		7·13		6·67							
Overheads	15·82		11·38		14·99		20·97		0·39 (Insurance)		0·68 (Insurance)			
TOTAL	42·54	22·92	37·85	13·00	37·43	18·34	43·26	15·10	16·80	4·72	17·66	5·50	17·22	5·57

NOTE I.—Rs./t—Rupees per tonne.

NOTE II.—Interest and overheads are applied to finished products and not to process units from 1970-71 onwards.

6.132. The consumption of chemicals and utilities in physical terms is given below:—

(Consumption per tonne of intake)

	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73
A. Intake (tonnes)	1,85,531	2,91,071	2,04,058	2,86,341	3,56,202	3,20,808	3,08,940
B. Consumption of Chemicals							
(a) Caustic Soda (Kg)	0·222	0·156	0·244	0·333	0·364	0·232	0·249
(b) Rock Salt (Kg)	0·038	0·082	0·058	0·057	0·050	0·066	0·038
(c) Calcium Chloride (Kg) (Unhyderous)	0·088	0·118	0·072	0·091	0·097	0·088	0·099
(d) Chlorine (Kg)	..	..	0·018	0·064	0·029	..	..
(e) Liquid So2 (Kg)	0·887	0·894	1·459	1·359	0·807	1·118	1·445
Consumption of Utilities							
(a) Power (KWH)	33·22	28·13	24·78	27·98	25·63	23·97	27·98
(b) Recirculating Water (M3)	38·93	34·92	31·44	34·11	35·16	28·03	27·73
(c) Steam 30ata/40ata (MT)	0·15	0·12	0·15	0·16	0·10	0·20	0·17
(d) Steam 13 at a (MT)	0·28	0·21	0·12	0·14	0·15	0·24	0·22
(e) Compressed Air (M3)	1·61	2·35	7·72	6·67	3·57	5·39	9·78

6.133. It as been stated that the consumption of SO2 during 1971-72 was high due to unsteady operations of the unit during January, 1972 and February, 1972 resulting in a shut down of the unit from 24th February, 1972. During 1972-73, the consumption was high due to leaks developed in mechanical seals and other equipments.

6.134. The Committee enquired whether there were any norms fixed for the consumption of chemicals and utilities and how the control on their consumption was exercised. In a written note the management stated as follows:—

"The designers have fixed the norms for the consumption of these items, which are being used at present as a guideline. The Technical Audit Cell, established recently, however, will be going into these norms more critically and will establish new standards/norms wherever required. It is true that the consumption of chemicals and utilities has been varying from year to year. In any process unit, the actual consumption is bound to vary. However, in case of chemicals like sulphur dioxide, even the designers have indicated that the consumption can vary between 1 and 2 Kg. per tonne of feed-stock processed. This is because of the peculiar nature of this process and the chemicals used for the extraction."

P. Consumption of utilities—Coking Unit

6.135. The consumption of utilities (Steam, compressed Air and re-circulating water) in the Coking Unit was substantially more than that provided for in the detailed project report. The value of excess consumption during the six years ending 31st March, 1972 works out to Rs. 13.57 lakhs as per details given below:—

Name of the Utility	Quantity consumed in excess of design	Rate at marginal cost *Rs.*	Amount *Rs.*
Steam at 13 atm in tonnes			
1966-67	18,927·25	8·305	1,57,190·81
1967-68	28,134·47		2,33,656·77
1968-69	31,794·15		2,64,050·42
1969-70	16,930·55		1,40,6c8·22
1970-71	18,387	8·305	1,52,704·04
1971-72	10,931		90,781.96
			10,35,992.22
Comperssed Air (In M3)			
1966-67	3,81,451	0.018	6,866.12
1967-68	8,14,125		14,654.25

Name of the Utility	Quentity consumed in excass of design	Rate at marginal cost Rs.	Amount Rs.
1968-69 .	. 19,53,773	0·018	35,167·91
1969-70 .	. 18,33,288		32,999·18
1970-71 .	. 25,15,811	0·018	45,284·60
1971-72 .	. 33,78,236		59,008·25
			1,93,980·31
Re-circulating Water (in M3)			
1966-67 . .	. 43,34,077	0·030	1,30,022·31
1967-68 . .	. 8,02,781		24,083·43
			1,54,105·74
	GRAND TOTAL :		13,87,078·27

6.136. Consumption of re-circulating water during 1968-69 to 1971-72 was less as compared to the designed capacity.

6.137. In a written note the Ministry have stated that the figures of consumption of utilities could not be precisely calculated in the absence of adequate metering system. It may be stated that Designers have provided a number of instruments for checking up of the utilities but these were not adequate for a complete balance. The action for procurement and installation of balance meters has already been taken up.

6.138. The Committee pointed out that the Coking Unit went into operation in October, 1964. They enquired as to why action in this regard could not be taken earlier. It has been stated that in the initial years, the efforts were directed towards stabilisation of the unit operations and optimisation of the product pattern, so as to maximise the refinery throughput. Since the overall consumption of the utilities for the whole refinery was reasonably comparable to the designed norms, attention was not diverted towards rigorous control of the utilities in the individual unit. After the stabilisation of the refinery operations, this aspect is also being looked into and the action has been initiated after the establishment of the Technical Audit Cells.

6.139. The Committee find that the Consumption of Chemicals and utilities in the Barauni Refinery has been widely varying from year to year without indicating any set pattern. The value of excess consumption of

utilities in the Coking Unit during the six years ending 31st March, 1972 was about Rs. 13.87 lakhs. The Committee are surprised to find that though the Unit went into operation as far back as 1964 the management have not considered taking action to instal adequate metering equipments for regulating consumption of utilities and it is only now that the Technical Audit Cell is stated to be going into the norms for consumption critically. The Committee recommend that the management should take steps to ensure that the metering equipment are installed without further delay.

6.140. The Committee need hardly emphasise the need for control on consumption of utilities with reference to norms in the interest of economising the processing cost.

6.141. The Committee also hope that the Technical Audit Cell would work out realistic norms for the consumption of utilities to enable the management to control the consumption with reference to such norms timely and to take suitable remedial measures to arrest excess consumption.

6.142. The Committee have already observed elsewhere in the Report that without any accurate system of recording the consumption of utilities it was not possible to make use of the system of costing as an instrument of control and also work out the processing cost on a realistic basis.

Q. Loss of Finished Products

6.143. During storage of finished products and in the process of their loading from the storage tanks to tank wagons/lorries products of the value of Rs. 25.36 lakhs were lost during the seven years ended 31st March, 1973.

6.144. The Management stated that the losses of finished products could arise on account of the following factors:—

(1) Evaporation losses

(2) Dipping errors

(3) Migration of products

(4) Leakage, spillages, etc. during the loading operations

(5) Accounting errors arising out of wrong calibration charts, conversion tables etc.

6.145. It has been stated that "the figures of losses indicated may be the cumulative effect of one or more of these factors. While the refinery has a system of collection of part of the spillages, leakages etc. by way of slopes which are reprocessed, the other losses due to evaporation, dipping errors, accounting errors etc. cannot be recovered. Losses due to migration in one tank may normally be compensated by gains in other products.

The arithmetical or dipping errors may also result in gains also being recorded in the books."

6.146. The Committee pointed out that no norms for these losses had been fixed by the Management and enquired about the reasons for the same and also the steps taken to reduce the losses. In a written reply, the Management stated as follows:—

> "By proper training, we have been trying to reduce the losses due to dipping errors or accounting errors so also the spillages, overfilling etc. By proper maintenance, leakages and migrations are being reduced. Certain norms have been fixed by the Central Excise Department, which are being used as guideline. The Technical Audit Section is studying these losses to suggest ways and means to reduce such losses.

6.147. During evidence the Managing Director further informed the Committee as under:—

> "In certain cases we have found that Central Valves which were provided in the beginning were not giving satisfactory service. They leaked and there was loss. We have taken a gradual process of changing these for a better quality."

6.148. The Committee regret to note that finished products of the value of Rs. 24.36 lakhs were lost during 1966-67 to 1972-73 in the Barauni Refinery during storage and in the process of their loading from the storage tanks to the tank wagons/lorries. The Committee are informed that by proper training, the Management are trying to reduce the losses due to dipping errors or accounting errors, spillages and overfilling. The Technical Audit Cell has also been asked to suggest ways and means to reduce the losses. The Committee fail to understand as to why Management could not have taken timely action to locate the deficiencies in the equipment to plug the loopholes. The Committee are of the opinion that if training programmes had been initiated much in advance, and schedules for maintenance drawn up and adhered to, the Refinery would not have been forced with this huge loss. The Committee hope that with the measures now being taken, the loss of finished products during storage and also in the process of loading etc. would be reduced to the minimum. The Committee also recommend that the Refinery should with the assistance of Technical Audit Cell fix realistic norms for such loss and ensure that these norms are strictly adhered to.

R. Flaring of Gas

6.149. According to the Revised Project Report, 183,360 tonnes of fuel consisting of 67,360 tonnes of fuel oil and 1,16,000 tonnes of gas produced in the various Units to be used in the Refinery at a throughput of two million tonnes.

6.150. The gas actually utilised as fuel was, however, much less than the gas produced as is indicated in the following table:—

Year	Gas produced	Gas used as fuel	Gas flared
1966-67 .	70,768	40,288	30,480
1967-68 .	1,08,705	56,098	52,607
1968-69 .	80,663	53,257	27,406
1969-70 .	89,681	71,805	17,876
1970-71 .	96,512	81,393	15,119
1971-72 .	95,034	76,915	18,119
1972-73	90,653	73,935	16,718

6.151. A quantity of 10-12 tonnes of gas is required to sent to flare to maintain a positive pressure in the Unit and to prevent any possibility of air mixing with the fuel gas leading to explosive hazards. Had the total gas produced (less the minimum quantity of gas required for flaring) been used as fuel in the refinery, fuel of worth Rs. 1.56 crores would have been saved during the years 1966-67 to 1972-73.

6.152. A study made by the Refinery authorities in January 1969 revealed that although there was enough scope to increase the firing of gas in Thermal Power House it could not be done as the Thermal Power House was not equipped to get timely warning for gas failure. Further because of ullage problems the Refinery was occasionally required to burn a higher volume of coking fuel oil and to send the gas to flare. The first difficulty regarding the pressure of gas could be overcome by installation of the pressure indicator with electrical transmission at site and pressure record with low pressure signalling at the boiler control, while the second difficulty could be overcome by increasing the sale of coking fuel oil/Low Sulphur Heavy Stock blend.

6.153. In a written reply the Management informed the Committee that the necessary equipments *i.e.*, Pressure Indicator, etc. were installed in the year 1971. As the Refinery was facing the problem of disposal of reduced crude and as such the liquid fuel was being burnt in preference to gas, the implementation was not taken as a priority scheme in 1969. When the situation with respect to the reduced crude disposal improved from 1970-71, the scheme was re-examined, modified and implemented.

6.154. It was stated that the gases going to flare had considerably reduced as would be noticed from the figures below:—

1966-67	43·1%
1967-68	48·4%
1968-69	34·2%
1969-70	20·0%
1970-71	15·7%

6.155. During evidence the Managing Director stated that the problem of flaring of gas had been redured to the minimum.

6.156. The Committee note that the Refinery had to resort to flaring of gas to maintain a positive pressure in the Refinery and to prevent possibility of air mixing with fuel gas leading to explosive hazards. Moreover, there was the problem of disposal of reduced crude. The percentage of gas flared was to the extent of 43.1 per cent in 1966-67, 48.4 per cent in 1967-68, 34.2 per cent in 1968-69 and 20 per cent in 1969-70. In subsequent years it was less than 20 per cent. The Committee are given to understand that had the total gas produced (less the minimum quantity required for flaring) been used as fuel in the Refinery, fuel oil worth Rs. 1.56 crores could have been saved during the years 1966-67 to 1972-73. It was only in January, 1969 that a study was made by the Refinery authorities which revealed that there was enough scope to increase the firing of gas in the power house. Thereafter steps were taken in 1971 for installing a pressure indicator with the electrical transmission at site and a pressure recorder with low pressure signalling at the boiler control. The Committee were informed that the problem of disposal of coking fuel oil| low sulphur heavy stocks has also since been overcome and the flaring of gas has been reduced to the minimum. The Committee are not happy about the failure of the Management to take action in time to instal the pressure gauge equipments, dispose of reduced crude in order to obviate loss on account of flaring of gas. The Committee recommend that the matter should be examined in depth with the assistance of Technical Audit Cell and in the light of the experience of Refineries elsewhere in order to reduce losses on account of flaring of gas to the absolute minimum.

6.157. The Committee would like to be informed of the concrete measures taken by Government/Corporation in pursuance of the above recommendation.

S. Effluent Treatment/Disposal

6.158. On 3rd March, 1968 there was a blaze in the river Ganga near Monghyr. The enquiries made by the Central Government revealed that

the accumulation of oil content of the effluent matter in the sandy part of the river bed beyond the discharge point was the cause of the fire. In order to have full investigation in the matter, to fix responsibility and to devise steps to guard against such events in future, the Government of India appointed a commission on 20th April, 1968 which submitted their report in July, 1969. The Commission *inter alia* recommended (i) Construction of approach road and (ii) discharge of final effluent into the mainstream of the river Ganges. They also recommended fixation of responsibility of Officers of the Refinery who were responsible for failure to ensure efficient treatment of the afluent and to discharge it in a proper manner into the river.

6.159. I.O.C. stated in March, 1972 that they were unable to implement the first two of the above recommendations made by the Commission. The reasons given by IOC were as follows:—

(i) *Construction of approach road*:—

It is not necessary to build a pucca road along the route of pipeline carrying effluent from the refinery to Ganges firstly because the pipeline is mostly underground and patrolling along the line will not be of much use and secondly because it is easier to inspect the out fall in the Ganges along the river bank from the bridge.

(ii) Discharge of Final effluent into main stream of the river.

"The Commission recommended that the refinery should ensure that the final effluent falls into the main stream of Ganges and gets properly dispersed in the river stream immediately after admission. The Commission suggested that any one of the four methods suggested by them or any other alternative techno-economically feasible method may be adopted."

6.160. IOC stated that by improving the performance of existing effluent treatment facility, Barauni Refinery had already succeeded in bringing down the phenol and oil content in the effluent within the permissible limits as laid down by ISI. It was proposed to reduce the oil content further to below 5 P.M. level and additional facilities were being installed for this purpose. With the installation of these facilities, the effluent from the refinery would even be suitable for irrigation purposes.

6.161. In view of this, IOC's view was that implementation of these two recommendations made by the Commission was not necessary.

6.162. The Ministry were not quite satisfied with the views expressed by IOC with regard to the implementation of these two recommendations and suggested reconsideration of their views. In January, 1973 IOC again **beads, balls, silicon crystal and epoxy compound, the entrepreneurs are**

reported that they had made a detailed study of the issue and stated that any scheme for the effective dispersal of the effluent into the river would involve huge expenditure of the order Rs. 1 to 2.5 crores and therefore they felt that the matter would have to be gone into in depth after consultation with specialised agencies like CWPC. IOC had been advised to take the expert opinion and also to take suitable action even if it be a little expensive, to ensure that there was no pollution of the river. IOC were also advised that they should satisfy the public health authorities of the State of Bihar that the measures being taken to prevent pollution of the river were adequate. The matter was stated to be under consideration by the IOC in consultation with CWPC.

6.163. As regards the fixation of responsibility and departmental action against the officers of the Refinery who were held responsible by the Commission, it was stated as follows:—

> "Out of the 3 top officers of the Refinery who were held responsible by the Commission of Inquiry for failure to ensure efficient treatment of the effluent and to discharge it in a proper manner into the river, one officer belonged to the All India Services. After inquiry, this officer has been exonerated. The other two are senior officers of the IOC. After preliminary inquiry against these two officers, IOC reported certain legal difficulties in proceeding with the inquiry and suggested that the cases would be disposed off by administering a warning to the officers in writing. The matter is under consideration in consultation with the Central Vigilance Commission.
>
> As regards the remaining 4 officers of the IOC departmental enquiry against them has since been completed. The Enquiry Officer's Report together with the proceedings of the enquiry have been submitted as per the prescribed procedure to the Central Vigilance Commission for the Commission's advice as to the further course of action. The Commission have since considered the Enquiry Officer's Report and advised that the report be accepted and the charges against the 4 officers be dropped."

6.164. The Committee take a serious note of the fact that although the Commission appointed by Government to go into the question of blaze in the river Ganga near Monghyr in March, 1968 due to accumulation of oil content of the effluent matter in the sandy part of the river bed beyond the discharge point, submitted their report in July, 1969, no final decision has yet been taken by Government/Corporation on the important recommendation made by Commission about discharge of effluent in the main stream of the River Ganges as it would involve heavy capital

expenditure of over Rs. 1 crore. IOC have instead improved the treatment of effluents before disposal so as to reduce the oil content to a safe level. The Committee feel that the problem of pollution of the river should have been tackled with all seriousness in consultation with C.W.P.C. and all others concerned in the interest of health of the inhabitants of that area. The Committee would like to be informed of the final decision taken in the matter by Government and the progress made in implementation thereof, within six months.

T. Variation in Throughput and Product Pattern

6.165. The actual throughput and the product pattern obtained in the refinery were not the same as envisaged in the design of the Refinery. The table below shows the effect of these variations during 1966-67 to 1972-73:—

(Rs. in lakhs)

Year	Capacity variance	Pattern variance	Total
1966-67	(—) 20·78	(—) 32·31	(—) 53·09
1967-68	(—) 13·74	(—) 74·12	(—) 87·86
1968-69	(+) 3·49	(=) 193·26	(—) 189·77
1969-70	(+) 48·79	(—) 235·75	(—) 186·96
1970-71	(+) 100·94	(—) 173·15	(—) 72·21
1971-72	(+) 151·98	(—) 153·18	(—) 1·20
1972-73	(+) 128·06	(—) 171·91	(—) 43·85
	(+) 398·74	(—) 1033·5	(—) 634·94

Notes :

1. The losses mentioned elsewhere in the chapter on account of capacity varian according to design are not included here.
2. The valuation of finished products as envisaged in the project Report and those actually produced has been done on the basis of average cost of production.
3. The yield pattern of AU III when processing Assam crude has been assumed to be the same as that of AVUs I& II in view of small percentage of Assam crude processed in AU-III.
4. The products of AU III when processing of imported crude has been deducted from the total production of various products to compare the design with the actuals when processing Assam crude.

6.166. These variations have been attributed by the Management (April, 1972) to the following reasons:—

(i) Production of naptha which was not contemplated in the project report had to be undertaken to meet the requirement of Fertilizer industry thereby resulting in reduced realisation of Rs. 175 lakhs during years 1966-67 to 1969-70.

According to the Ministry the price of naphtha was not fixed on import parity basis but was deliberately fixed low as it is an important raw material for production of fertilizers. It has further been stated that if the Refinery had produced motor spirit instead of naphtha, most of it would have had to be moved out to distant regions leading to under-recoveries on account of freight as the demand for motor spirit in Barauni region is small.

(ii) Production of JP-4 and aviation gasoline was restricted to actual requirements, necessitating the downgrading of components and their disposal as MS/SK. This resulted in reduction of profit to the extent of Rs. 162 lakhs and Rs. 34 lakhs respectively.

(iii) Production of LPG was restricted to what could be marketed with consequent reduction of profit by Rs. 50 lakhs.

(iv) Production of ATF was regulated according to actual demand as a result of which the refinery lost about Rs. 28 lakhs.

(v) The balance variations were caused by other factors such as change in crude quality, operational problems in coking unit and market demand.

6.167. The Committee enquired whether any change in the product pattern is envisaged due to tight position of crude and in what way the profitability of the Refinery was going to be effected by such variation in the product pattern. In a written reply the Management stated as follows:—

"Due to the tight position of the crude, the Government's policy is to reduce the consumption of Motor Spirit for which the price and duty has been increased on 3rd November, 1973. This was intended to cut down consumption of Motor Spirit by about 25 per cent so that the Naphtha thus released could

be diverted for the production of fertilizers. Due to lower production of Motor Spirit and resultant increase in Naphtha production the profitability of this Refinery will be reduced to the extent of the price differential between MS and Naphtha which is about Rs. 122 per tonne with effect from 3rd November, 1973. The precise impact of this policy on Motor Spirit/ Naphtha production will, however, be known in due course of time."

6.168. About the fixation of price of Naptha the Ministry stated as under:—

"The price of bulk refined petroleum products is being fixed by the Government on the decisions taken on the recommendations of the Shantilal Shah Committee Report. When the Shantilal Shah Committee gave its report in October, 1969, Naphtha was a surplus product in the country and the Committee did not consider it appropriate to fix the price of naphtha on the import parity basis, since it was being exported at very low prices. The position has subsequently changed and price of imported naphtha has steadily increased and the country has also become deficit in naphtha. To bridge the large gap between the high import price and low indigenous price, ad hoc increase in the price of naphtha of Rs. 40 per tonne and Rs. 60 per tonne respectively, have been given at two occasions in June, 1973 and August, 1973.

The suggestion that different prices of naphtha may be charged to different users raises wider issues. A new oil pricing committee is being set up to review the existing pricing arrangement for petroleum products and this suggestion would be remitted for consideration to this committee.

6.169. The Committee find that the actual thoroughput and the product pattern obtained in the Refinery were not the same as envisaged in the design of the Refinery as a result of which the Refinery suffered cumulative loss of about Rs. 635 lakhs during the period from 1966-67 to 1972-73. The loss would be much more if the losses on account of variances in capacities from the design are also taken into account. The Committee recommend that a technical committee should examine all aspects relating to the product-mix of the Barauni Refinery in order to suggest measures to reduce the losses due to variations in the product-pattern.

U. Liquified Petroleum Gas

6.170. (a) According to the revised Project Report, 65,400 tonnes of liquified petroleum gas per year, as detailed below, could be obtained from the Atmospheric Vacuum Units I & II and the coking Unit:—

In tonnes

Hydrocarbons	AV. Us	Coking unit	Tota·
C_3 . . .	12,200	4,800	17,000
C_4 . . .	38,200	10,200	48,4c0
	50,400	15,000	5,400

6.171. Out of the total quantity of 65,400 tonnes of LPG, 10,000 tonnes were to be transferred to the gas filling station, 18,000 tonnes could set into gasoline and the balance quantity of 37,400 tonnes was to be discharged to the fuel gas system. The Atmospheric Vacuum Unit I went an stream on 22nd July, 1964 but the production of LPG was started from 5th August, 1965 due to non-availability of cylinders.

6.172. No LPG was obtained from the Coking Unit due to unsteady operation of its stabilisation section. In this connection, the Management have stated as follows:—

"There was no loss due to non-production of LPG from the Coking Unit as the LPG production from the distillation units was sufficient to meet the requirements of LPG as indicated by Marketing Division. It may be mentioned that as per the recent assessment of market demand, it may not be necessary to produce LPG from the Coking Unit for another 3-4 years. It may also be mentioned that the gas from the Coking Unit is presently being used as refinery fuel thereby improving the availability of LSHS, a low sulpnur fuel needed by steel industry.

6.173. The table below indicates the quantity of LPG obtained from the two AVUs during the years 1966-67 to 1972-73:—

(In tonnes)

Year	Quantity obtained
1965-66	239
1966-67	1298
1967-68	2891
1968-69	4427
1969-70	7006
1970-71	9745
1971-72	10720
1972-73	14729

6.174. The quantity of LPG obtained from the Atmospheric Vacuum Units was much less than the designed capacity.

6.175. The shortfall in production of LPG from the AVUs was mainly on account of the following reasons:—

(i) Production of Off-specification LPG in earlier years due to non-provision of caustic and water washing facilities in the A.V.U's. for L.P.G.

(ii) Inadequate shortage capacity for LPG;

(iii) Inadequate number of weigh scales and of filling points at LPG shed;

(iv) Frequent interruptions in the cylinder filling operations due to poor performance of the weigh scales and leakages from the filling guns and irregular off-take of filled cylinders;

(v) Non-availability/short and interrupted supplies of LPG cylinders.

6.176. The Management stated (July, 1971) that "the production/off take of LPG has to be correlated with the availability of cylinders and development of market. This is a gradual process."

6.177. In a written note the Management informed the Committee as follows:—

"The various handicaps mentioned pertain mainly to the initial years when the quality of LPG production and the filling operations were being stabilised. Most of these limitations are of

a general nature and corrective steps were taken from time to time, as otherwise it would not have been possible to improve the production and filling rates year to year.... It may be mentioned that the problems of the leakages from the filling guns and other minor interruptions in other equipments do come up at times but this does not necessarily affect the production levels adversely.

However, with a view to improve the flexibility of operations two more filling points were added in the year 1971 and action on provision of additional storage capacity is in advance stage of implementation.

We feel that the production of LPG could have been increased if cylinder availability was better. The filling capacity could have been increased by operating the filling facilities for extra hour sas been done from time to time."

6.178. The Committee enquired whether the comparative economics of importing the steel and thereby increasing the sale of LPG *vis-a-vis* the saving in other domestic fuels like kerosene oil that would have accrued and in turn resulted in the saving of foreign exchange being spent on its import were considered by the Management. The Management stated as follows:—

"The issue of importing steel and thereby increasing the sale of LPG, which, *inter-alia* would result in saving in consumption of kerosene was taken up by IOC with the Ministry of P. & C. on several occasions. However, due to the difficult foreign exchange position prevailing during the year 1966-67 and onwards, IOC's request for foreign exchange from free sources could not be agreed to by the Government. However, Import licence from rupee sources was made available to IOC but steel against this could not be imported, as procurement of special quality of steel for LPG cylinders from rupee sources involves switch deal. Normally rupee sources countries supply LPG quality steel by procuring from free sources countries and routing the supply through them. In such a switch deal, the Manufacturers' original certificate for the quality of steel is not available. In absence of such a certificate, it becomes difficult to accept the steel for fabrication of LPG cylinders, for which very rigid specifications are to be applied.

In late 1966 and early 1967, Hindustan Steel Rourkela had indicated to Iron & Steel Ministry that they would be able to produce LPG quality steel for fabrication of LPG cylinders In

the light of this, Iron and Steel Ministry advised P. & C. Ministry not to import steel if indigenous supplies could be made available. It may be mentioned that apart from taking up the question of getting the increased indigenous availability of steel suitable for LPG cylinders, the Corporation has also taken up the question of release of foreign exchange for importing LPG steel for meeting the shortfall required for the year 1973-74 and 1974-75."

6.179. As regards the action taken by Government to realise the requisite foreign exchange for importing steel the Ministry have in a written note informed the Committee as follows:—

"900 MTs of imported steel was utilised for cylinder fabrication during the period 1965 to 1967. Thereafter there has been no import of steel on IOCs account till the current year as it was anticipated that the indigenous production of steel would be sufficient to meet IOC's requirements. Indigenous production of steel has been continuously increasing since 1967-68. This has, however, still been below the IOC's requirements and the indicated production targets. Import of steel was not asked for by the IOC during these years in anticipation of increase in the availability of indigenous steel but since indigenous production has consistently remained below the anticipated production targets, application for import were processed again in 1972 and import of 5,000 tonnes of steel has been allowed again during 1973-74."

6.180. The Committee note that though the Project Report envisaged the potential of 50,400 tonnes of liquified petroleum gas per year from the Atmospheric Vacuum Units I and II and 15,000 tonnes per year from the Coking Unit of the Barauni Refinery, no LPG was obtained from the Coking Unit due to unsteady operation of its stabilisation section. There was also delay of about one year in starting the production of LPG in Atmospheric vacuum Unit I due to non-availability of cylinders. The Committee also note that in spite of the gradual increase in the production of LPG from 239 tonnes in 1965-66 to 14,729 tonnes in 1972-73, it is still much short of the potential envisaged in the DPR. Production of off-specification LPG in the earlier years due to non-provision of caustic and water washing facilities in the Atmospheric Units, inadequate storage capacity for LPG, inadequate number of weigh scales and of filliing points at LPG shed, frequent interruptions in the cylinder filling operations due to poor performance of weigh scales and leakages from filling guns and irregular off-take of filled cylinders and non-availability/short and interrupted supplies of LPG cylinders have been cited as the reasons for the shortfall in the production of LPG. The

Committee are informed that corrective steps had been taken from time to time to solve these problems. It has, however, been stated that the production of LPG could have been increased if cylinder availability was better.

6.181. The problem of non-availability/shortage of a particular type of steel required for LPG cylinders and the consequent shortfall in the production and marketing of LPG have been dealt with in the report of the Committee on IOC (Marketing Division). The committee desire that Government/corporation should take timely action in future about the procurement of steel either through indigenous sources or through imports to see that lack of cylinders does not depress production.

6.182. The Committee also hope that maximum possible production of LPG would be achieved in the IOC Refineries as low production of LPG means wastage of valuable gas in flaring, higher consumption and larger import of kerosene or crude which the country can ill-afford at present when it is faced with the oil crisis.

V. Modernisation of LPG Bottle Filling Plant

6.183. The facilities envisaged in the Project Report provided for manual filling of a limited number of LPG cylinders (2500 per 8 hour shift). The possibility of over-filling/under-filling of cylinders could not, therefore, be ruled out. Besides, the existing facilities did not also meet the following essential requirements:—

(i) Hydraulic testing of cylinders.

(ii) Washing and painting of cylinders.

6.184. With the establishment of LPG market and the stabilisation of its production the necessity to improve the LPG filling and handling facilities was felt. The work for the modernisation of the existing LPG bottle filling plant (design, engineering, supply of equipment and materials, fabrication, erection and commissioning of the plant and equipment) was entrusted on 24th January, 1969 to M/s. Engineers India Limited another Government of India Undertakings, on a single tender basis at a price of Rs. 21.98 lakhs (including foreign component of Rs. 2,25,500). Even after modernisation, the plant will be capable of filling only 2500 domestic type cylinders per 8 hour shift.

6.185. According to the original schedule, the work was to be completed by 31st January, 1970 (except imported items). The date was extended up to 31st May, 1970 on account of changes necessitated by the incorporation of 15 Kgs. cylinders in the modernisation scheme. M/s. Engineers India Limited, however, completed the work in March, 1972 and the plant went into operation after that.

6.186. The Committee pointed out that the production of LPG was started in August, 1965 whereas the work of modernisation of the filling plant was awarded in January, 1969. They enquired as to why timely

action was not taken for the provision of necessary facilities. The management stated as follows:—

> "The LPG cylinders are to be tested, washed and painted once in 5 years. There was, therefore, no unsafe practice followed. The facilities for hydraulic testing, painting, etc. were not envisaged in the original design as these are normally the functions of the Marketing Division. However, to provide an integrated service, these facilities were provided at the Barauni Refinery in the modernisation of LPG filling."

6.187. Asked whether any penalty had been imposed on M/s. Engineers India Ltd. for the delay in the completion of the work, the Ministry have stated as under:—

> "The question of levying penalty for delaying the completion of work by M/s. EIL is still under examination by IOC since EIL have put forth certain reasons covered under force majeure clause as the cause for delay against imposition of penalty."

6.188. The Committee find that the work of modernisation of the LPG bottle filling plant was entrusted to M/s. Engineers India Ltd. in January, 1969. Though the work was scheduled to be completed in January, 1970. It was, actually completed only in March, 1972 i.e. after more than two years during which period the essential facilities such as hydraulic testing, washing and painting of cylinders could not be provided. The Committee are surprised to note that the question of levying penalty on M/s. Engineers India Ltd., for the delay in the completion of the work is still under examination of IOC, even after a lapse of two years.

6.189. The Committee recommend that the reasons for the delay sohuld be investigated by Government and the matter finalised without any further delay.

VII

GUJARAT REFINERY

A. Refinery Capacity

7.1. Following the discovery of oil fields at Ankleshwar in the State of Gujarat, the Government of India decided to set up a third Refinery in the Public Sector in the Gujarat State in technical collaboration with USSR. In terms of the agreement concluded between the Government of India and the Government of U.S.S.R. on the 21st February, 1964, the Soviet Government offered financial and technical assistance for the setting up of this refinery with an initial capacity of 2 million tonnes per year.

7.2. The construction of the Refinery was started in October, 1963. The first phase comprising of one million tonnes per annum capacity of the Refinery was commissioned for trial production in October, 1965 and full production at rated capacity was achieved in December, 1965.

7.3. The second phase of the Refinery comprising of second million tonne per year capacity was ready for operation by the end of June, 1966; but it was not possible to operate it as the Catalytic Reforming Unit was not ready by that time. Both the units, however, started operating from October, 1966.

7.4. The capacity of the Refinery was subsequently expanded to 3 million tonnes per annum.

7.5. The construction work for the expansion was started in April, 1966 and the unit was commissioned in September, 1967. After the start-up of the refinery, continuous efforts were made to increase the capacity by debottle-necking. By operational changes and improvements, it has been possible to increase the capacity of the refinery to 3.6 million tonnes per year. With this achievements, the engineers and technologists of the refinery were all the time engaging their attention to increase the capacity still further by modifications, installation of additional facilities and re-arrangement of the existing equipment etc. By systematically making all these changes and modifications, it has been possible to increase the capacity of this refinery upto 4.3 million tonnes per year. The present operating capacity is, however, approximately 3.8 million tonnes; and due to the non-availability of crude from ONGC, the refinery is not in a position to go up to the attainable capacity. It has been stated that ONGC expects to step up supplies to the level of 4.3 million tonne by 1974-75.

7.6. A major expansion of the Koyali Refinery by 3 million tonnes to raise its total capacity to 7.3 million tonnes per year has been taken up during 1973-74. The Refinery would process imported crude in addition to indigenous crude oil from the Gujarat fields. The expansion project is being handled by Engineers (India) Ltd. The project is expected to be completed initially in the later part of 1976 and finally by April, 1977. The total cost of the expansion is estimated to be Rs. 28.08 crores.

7.7. The Committee find that the Gujarat Refinery was designed for a capacity of 3 million tonnes per annum. The capacity has been increased to 4.3 million tonnes by bringing about operational changes and modifications. The existing utilisation of capacity is, however, 3.8 million tonnes per year because ONGC is unable to supply the full quota of crude. The Committee recommend that ONGC should step up efforts to increase the supply of crude to the Refinery.

7.8. The Committee need hardly point out that any further expansion of the Refinery should be done only after fully ensuring the desired quota of indigenous/imported crude.

B. Processing Unit and Product-mix

7.9. Besides Atmospheric Unit I, II and III, the Refinery has the following processing units.

(a) *Catalytic Reforming Unit*

7.10. Naphtha produced in Atmospheric Units does not meet the Octane specification for the market requirement of motor gasoline. This unit reforms the paphtha stream with Platinum Catalyst to obtain a higher octane reformate for blending into M.S. The Unit also produced feedstock for the Udex Unit. The products of this unit are reformed gasoline and fuel gas for use in the Refinery. The unit has a design capacity of 3,00,000 metric tonnes a year.

(b) *Udex Unit*

7.11. The Udex Unit which is basically an extracting unit for extracting Benzene and Toluene from Aromatics Reformate has an annual capacity of 109,000 metric tonnes of Reformate, producing 33,000 tonnes Benzene and 14,000 metric tonnes Toluene. The capacity of the Udex Plan has been raised to produce 45,000 tonnes of Benzene per year by spending about Rs. 1 lakh for minor modifications.

(c) *Ethyl Blending Plant*

7.12. This unit comprises of storage for TEL drums, facilities for Ethyl blending and dye addition and TEL extraction from TEL wash. A check and change house with a laundry facilities is also incorporated. The Unit has a blending capacity of 1,86,000 tonnes per year. This capacity is based on single shift (6 hrs.) operation and can be increased depending upon the demand for the product. Throughput during 1969-70 was 4,76,353 tonnes.

(d) *LPG Filling STATION*

7.13. The LPG filling station was designed for filling 2000 Indane cylinders per day, amounting to about 10,000 tonnes per year. Production facilities, cylinder filling capacity and bulk loading facilities for LPG have been improved in the Refinery. On account of this the refinery was able to despatch 60,000 tonnes of LPG per year, as could be seen from the Annual Report of the Ministry (1973-74).

7.14. The main products of the Gujarat Refinery are LSHS, HSD, LDO, SK, MS, ATF, Naptha, LPG, Benzene and Toluene. The Refinery has started producing special cut naphtha for the Indian Petro-Chemicals Corporation.

C. Design, Equipment and Material

7.15. The Management have informed the Committee that for the first time in the country's oil sector 40 per cent of the Refinery's design drawings were prepared by Indian Engineers in collaboration with a small team of seven Russians at Baroda itself in a record time of six months. Also working drawing for the expansion of Gujarat and Barauni Refineries have been done 100 per cent by the same design organisation.

7.16. Unlike other earlier Refineries, Gujarat Refinery utilised about 60 per cent of the equipment and material from indigenous sources for the second million tonne and about 75 per cent for expansion to three million tonne capacity. In respect of Udex Plan equipment utilised from indigenous sources was about 70 per cent.

7.17. The expansion of the Refinery from 4.3 to 7.3 million tonnes per annum entails putting of a new distillation unit and secondary processing facilities is being designed and built without foreign collaboration.

7.18. The Committee note that 40 per cent of the Refinery's design drawings were prepared by Indian Engineers in collaboration with a small team of seven Russians, and that the expansion of Gujarat and Barauni Refinery was done 100 per cent by the same organisation. The Refinery utilised about 60 per cent of equipment and materials from indigenous sources and about 75 per cent for the expansion to three million tonnes. The expansion of the Refinery to 7.3 million tonnes is being designed and built without foreign collaboration.

7.19. The Committee hope that Government/Corporation would emulate the example of Gujarat Refinery while planning and executing the expansion/creation of capacity in the country during the Fifth Five Year Plan.

D. Project Cost

7.20. The capital cost for the two million tonnes capacity, was initially estimated at Rs. 27.78 crores (excluding the cost of land for refinery, township and other connected works amounting to Rs. 3.61 crores). This was revised to Rs. 30.99 crores in October, 1963. The actual expenditure incurred up to March, 1973, amounted to Rs. 26.27 crores.

7.21. The actual expenditure on the expansion of the refinery from 2 million to 3 million tonnes was Rs. 2.4 crores as against the estimate of Rs. 2.9 crores.

7.22. The actual expenditure on the Udex Plant was Rs. 2.56 crores as against the estimated cost of Rs. 2.69 crores.

7.23. The expansion of the Refinery to 7.3 million tonnes per annum is expected to cost Rs. 28.08 crores.

7.24. The Committee note with satisfaction that the Corporation was able to effect a saving in the capital cost of the Refinery. The actual expenditure incurred by the Refinery for the two million tonnes capacity was 26.27 crores as against the project estimate of Rs. 30.99 crores. The actual expenditure on the expansion of Refinery from 2 million tonnes was Rs. 2.4 crores as against the estimate of Rs. 2.9 crores. The actual expenditure on the Udex Plant was Rs. 2.56 crores as against the project estimate of Rs. 2.69 crores.

E. Change of organisation structure

7.25. For the first time in the public Sector, the concept of staff and line function was introduced in this refinery about 3½ years ago. Also a new concept "Technical Audit" was introduced. With the introduction of these systems of 'Checks and Balances', there has been vast improvement in the performance of this refinery. The capacity of the refinery has been increased by more than 25 per cent, the plant downtime has been reduced almost to half by proper inspection and preventive maintenance, consumption of utilities, fuels and chemicals, etc. have been substantially reduced. The profitability of this refinery has gone up and one major reason for this could be attributed to the introduction of these new systems.

7.26. The Committee find that the concept of staff and line function was introduced in the Gujarat Refinery about 3½ years ago. The new concept of "Technical Audit" has also been introduced in this Refinery. As a result of proper inspection and prevention maintenance, consumption of utilities, fuels and chemicals have been reduced thereby increasing the yield and reducing the processing cost.

7.27. While the Committee appreciate the steps taken by the Gujarat Refinery they hope that similar steps would be taken in the other IOC refineries in order to bring about improvement in operating efficiency and

effect economies in costs.

F. Agreement with foreign suppliers

7.28. The contract with the U.S.S.R. suppliers provided for the supply of equipment and materials weighing 15,350 tonnes for the setting up of the refinery, having a capacity of 2 million tonnes, at a total CIF value of Roubles 12.5 millions. Additions/replacement of the equipment and materials could, however, be made, without affecting the capacity of the refinery as well as the quality and quantity of the oil products within a limit of 5 per cent without any change in the agreed price of Roubles 12.5 millions. Subsequent to the signing of this contract, equipment and materials to the extent of 204,196 tonnes were deleted from the supply schedule of the contract in terms of the protocol dated 9th October, 1964, as these were available from indigenous sources. The protocol was, however, silent about the possible reduction in the contract price in lieu of the deletion of the quantity from the contracted supplies. The Management stated (July, 1970) that the value of indigenous purchases made in place of deleted items cannot be segregated at this stage as these items were of general utility and were procured as part of overall requirements for construction and operation.

7.29. The quantity of equipment and stores actually supplied by the foreign suppliers was 15,306 tonnes as against the stipulated quantity of 15,146 tonnes (i.e. 15350 less 204 deleted). Of the quantity received, only 13,925 tonnes of materials were consumed on erection, rendering 1,350 tonnes as surplus (31 tonnes were lost/short received) of which 327 tonnes were subsequently used on other works. In regard to the disposal/utilisation of the balance 1023 tonnes of stores valuing Rs. 44 lakhs, the Management have stated (September, 1971) as follows:—

> "This quantity was made up of various items such as pipes, valves, electrical material, cables, bends, bolts, nuts, instruments etc. These items have been subsequently taken on charge on Bin Cards along with similar indigenous materials under various categories of stores in their natural unit of measurements. Thereafter issues transfer to other units of Indian Oil Corporation have taken place. We are having under the category of Russian Stores materials worth only Rs. 3.53 lakhs as on 31-3-1971 which in due course will be transferred to appropriate codified groups. In view of this, it is not possible to work out the quantity and value of the Russian materials that may still be lying in stocks in the refinery."

7.30. In February, 1970, the refinery preferred a claim for Rs. 15.76 lakhs against the foreign suppliers, on account of the value of the deleted

items weighing 204.196 tonnes (Rs. 10.92 lakhs) and due to defective material and other causes (Rs. 4.84 lakhs). The claim has not been accepted by the suppliers so far.

7.31. The Committee enquired as to why action was not taken to work out the quantities of material and list of equipment which could be available indigenously before finalising the list of equipments and materials to be imported under contract. The Ministry stated as follows:—

> "The requirement of equipment/materials was drawn up after detailed discussion with USSR suppliers. The 204,196 M.T. of material which IOC asked them to delete was later identified as not complicated for manufacture indigenously which the suppliers agreed to delete. This exercise of a second detailed scrutiny was carried out very much later keeping in view the then indigenous availability."

7.32. Asked about the reasons for preferring the claim after about six years of the deletion of these items/receipt of defective materials etc. it has been stated that:

> "The claim for reimbursement of deleted items along with various other claims relating to defective materials and other causes could be preferred only after the supplies against the contract with the Russian Suppliers had been completed. Since the supplies were completed, sometimes in 1966 and the details of other claims relating to defective materials etc. could be claimed and prepared in July, 1969, the claims were finally preferred only in February, 1970."

7.33. The Ministry have now informed the Committee that the "suppliers have agreed to re-examine the matter. IOC are pursuing the matter and have not so far sought assistance of Government for the recovery of the claim."

7.34. The Committee find that a contract was signed with the U.S.S.R. suppliers for supply of equipment and materials weighing 15,350 tonnes for the setting up of the Gujarat Refinery. Subsequently, 204,196 tonnes were deleted from the supply schedule of the contract in terms of the protocol dated 9th October, 1964, as these materials were available from indigenous sources. The Committee also note that the protocol was silent about the possible reduction in the contract price in the case of deletion of the quantity from the contracted supply.

7.35. The Committee regret to note that though the supplies under the protocol were completed as early as 1966, it was only in February,

1970 after a lapse of six years from the date of protocol, that a claim for Rs. 15.76 lakhs was preferred against the foreign suppliers on account of the value of deleted items weighing 204.196 tonnes (Rs. 10.92 lakhs) and also for defective materials and other causes (Rs. 4.84 lakhs). This claim has not been accepted by the suppliers so far. The Committee are also surprised that the management has not sought the assistance of Government for the recovery of the claim in spite of the long delay in the settlement of the claim by the foreign suppliers.

7.36. The Committee are now informed that the suppliers have agreed to re-examine the matter. The Committee desire that the matter should be pursued vigorously with a view to effecting an early settlement of the claim.

7.37. The Committee are informed that it was not possible to work out the quantity and value of Russian materials that might still be lying in stock in the Refinery. The Committee fail to understand as to why the materials received under the agreement should not have been kept separately throughout. The Committee recommend that the matter should be investigated to fix responsibility for the lapses. The Committee should be informed of the action taken.

G. Erection and Commissioning of the Units

7.38. The scheduled date of completion and the actual date of completion of the first phase of the refinery consisting of one Atmospheric Unit of one million tonnes and a thermal Power Station, the second phase of the refinery consisting of one million tonnes Atmospheric Unit and the Catalytic Reforming Unit and the third phase consisting of expansion of the refinery from two million tonnes to three million tonnes are indicated below:—

Units of the Refinery	Original date of completion	Actual date of completion
First phase consisting of one million tonne Atmospheric Unit and a Thermal Power Station.	December, 1964	September, 1965
Second Phase cosisting :		
(a) o million tonnes Atmospheric Unit	Middle of 1965	June, 1966
(b) Catalytic Reforming Unit . .	„	October, 1966
Third Phase consisting of Expansion of refinery from 2 million tonnes to 3 million tonnes.	Middle of 1967	September, 1967.

7.39. The delay in the supply of equipment by the Soviet suppliers was one of the causes for the delay in completion of the Units. But no penalty could be levied in the absence of a suitable provision in the agreement.

7.40. In a written note the Management have informed the Committee that apart from the late arrival of the Soviet equipment the delay in the completion of Unit was also due to non-receipt of drawings in proper sequence and according to agreed schedules. In the case of Thermal Power Station and also in other plants of the Refinery there had been abnormal delays in the despatch of drawings.

7.41. There were also delays in laying the Railway siding into the Refinery as the residents of Karachia village through whose land the Railway siding was passing had approached the High Court to secure a writ. Consequent on the delay in laying of the Railway siding the heavy equipment which arrived from the USSR could not reach the working site in time.

7.42. There was also a strike by the employees of the main mechanical contractors lasting for about 2 months which also caused some delay in the construction schedule.

7.43. It has been stated that "it is not easy to apportion the extent of delay precisely to each of the above factors."

7.44. The delay in the completion of first phase of the Gujarat Refinery consisting of Atmospheric Unit of one million tonne and a thermal power station was commented upon by the Committee on Public Undertakings (1966-67) in para 122 of their Thirty Sixth Report (Third Lok Sabha—March, 1967). The Committee observed that "while considering the delays that take place in the construction of refineries one basic fact which has to be remembered is that imports have to be made to meet the demands of refined petroleum products in the country". The Committee, therefore, urged that in planning and executing future refineries and in expanding the present refineries this aspect of the matter should be borne in mind by Government.

7.45. The Committee find that there has been delay of 3 to 12 months in the completion of the various units of the Gujarat Refinery due to delay in the supply of equipment and detailed working drawings by the collaborators. The delay was also stated to be due to occasional strike by the workers of the contractors.

7.46. The Committee reiterate their earlier recommendation in paragraph 122 of their 36th Report (3rd Lok Sabha) that the delay in the execution of schemes regarding creation/expansion of refinery capacity in the country should be avoided at all costs so that import of petroleum products involving huge amount of foreign exchange is reduced to the minimum.

H. Udex Plant

7.47. In July, 1964 Government approved the setting up of an Udex Plant for the manufacture of benzene and toluene from the reformed naphtha.

7.48. According to the delivery schedule stipulated in the contract dated 15th December, 1964 with M/s. Nuovo Pignone of Italy the erection of the Udex Plant was to be completed within 27 months from the date of enforcement of the contract. The date of enforcement of the contract was September, 1965 and accordingly the erection of the plant should have been completed by December, 1967.

7.49. The following table gives the scheduled dates and the actual dates of completion of the various stages of the Project.

	Scheduled date	Actual date	Delay
(a) Supply of basic data by the owners to the contractors-within 45 days of the contract	28-10-1965	January, 1966	3 months
(b) Delivery of purchase specification of materials and equipment 11 months, from the effective date of contract. .	13-8-1966	February, 1967	6 months
(c) Delivery of drawings and specifications 14 months from the effective date of the contract.	13-11-1966	15-2-1967	3 months
(d) Delivery of 90 percent of the materials and equipment—within 22 months of the effective date of the contract. . .	13-7-1967	5-4-1967	..
(e) Completion of the project—27 months from the effective date of the contract.	13-12-1967	December, 1968.	12 months

7.50. The delay has been attributed by the Management to the following factors:—

(i) Although the contract was signed in December, 1964 it came into force only in September, 1965 as the bank guarantee was delayed by about 9 months due to the transfer of the plant from ONGC to the IOC involving amendment of the import licence.

(ii) There was delay of 3 months on the part of foreign suppliers in despatching final specifications and drawings of main civil works resulting in the delay in calling for civil tenders.

(iii) Delay of 3 months on the part of the contractors in supplying the basic data and the Indian standards on account of delay in sending the standards for structural steel by the Company.

7.51. No responsibility for delay could be fixed on the foreign contractors in terms of the contract.

7.52. As regards the issue of bank guarantee and the amendments of import licence, the Ministry have explained the position as follows:—

"As per terms of the contract ONGC was required to obtain a letter of guarantee from the State Bank of India. ONGC in turn approached the Government for issue of counter guarantee. As a special case, counter guarantee of Government of India was communicated in May, 1965. The Koyali refinery was transferred to IOC from ONGC in April, 1965. IOC requested for clarification in May, 1965 as to whether the refinery transferred to them included the Udex Plant. In July, 1965 it was decided that the Udex Plant would form part of the refinery and would therefore be with the IOC. The counter guarantee earlier issued on behalf of ONGC was then transferred in favour of IOC in August, 1965.

On 2nd September, 1965 IOC stated that their import licence dated 12-3-1965 for Rs. 61.24 lakhs was expiring on 12th September, 1965 and they requested the CCI&E for revalidation of the licence up to 15-12-1966. On the same day, Ministry requested CCI&E for revalidation of the licence and the CCI&E revalidated the import licence on 3-9-1965."

7.53. The Committee find that the Udex Plant of the Gujarat Refinery was originally scheduled to be completed by December, 1967 it was, however actually completed in December, 1968. There has been an initial delay of 9 months as the bank guarantee already issued to ONGC had to be transferred in favour of IOC and the import licence had to be revalidated. Consequent on the transfer of the Refinery from ONGC to IOC. The date of contract with the Italian firm was accordingly shifted from December, 1964 to September, 1965. There had also been a delay of one year in supplying of the basic data by the owners to the contractors (3 months), in the delivery of purchase specification and equipment (6 months) and in the delivery of drawings and specifications (3 months).

7.54. The Committee are not happy over such administrative delays which had resulted in delay in the erection and commissioning of the Plant. They hope that such delays would be avoided in future.

L. Designed Capacity and product mix

7.55. The refinery comparises the following main units:—

Unit	Designed capacity	Date of commissioning	Input	Output
Atmospheric re-run units	1 million tonne each	October, 1965, June, 1966 and September, 1967	Crude Oil	Motor Gasoline, aviation turbine fuel Lighting Kerosene, LPG diesel fuel, other solvents
Catalytic reforming Unit	3,00,000 tonnes	October, 1966	SR Gasoline cuts & other cuts from Atmospheric re-run units	To enrich the SR gasoline cuts with required octane specification of motor-spirit
Udex Plant	1,09,000 tonnes,	December, 1968	Catalytic reformate	Benzene, toluene, raffinate
Ethyl blending plant	1,86,000 tonnes	November, 1965	Motor gasoline	To ethylate motor gasoline

J. Production Performance

7.56. The Project Report for the two million tonnes capacity envisaged the production of seven items against which 13 items of finished products are now produced. One of the finished products envisaged in the project report (solvents) is not being produced as the market is fully saturated with the solvents produced by the Private Oil Companies. Seven new products *viz.*, JP-4, Naphtha Benzene, Toluene, L.D.O. (C), L.D.O: and M:S;, (93 RON) have been added.

7.57. The following table indicates the installed capacity of the units and the actual quantities processed there against during the seven years ending 31st March, 1973:—

(In tonnes)

Unit	Designed capacity	Actual quantity processed						
		1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73
1	2	3	4	5	6	7	8	9
Atmospheric Re-run Unit I								
(a) Crude oil and slops processed .	10,00,000	6,03,367	7,84,234	10,26,202	12,28,722	12,01,951	13,05,418	13,48,359
(b) Percentage of crude and slops processed to installed capacity		60·34	78·42	102·62	122·87	120·20	130·54	134·84
Atmospheric Re-run Unit II								
(a) Crude oil and slops processed .	10,00,000	7,83,868	10,04,393	10,33,336	11,79,801	12,36,872	12,22,599	13,98,942
(b) Percentage of crude and slops processed to installed capacity		78·39	100·44	103·33	117·98	123·69	122·26	139·89
Atmospheric Re-run Unit III								
(a) Crude oil and slops processed .	10,00,000		1,36,021	9,12,069	10,08,074	10,44,304	11,35,727	10,02,949
(b) Percentage of crude and slops processed to installed capacity		..	13·60	91·21	100·81	104·43	133·57	100·29
Catalytic Reforming Unit								
(a) Charge stock processed	3,00,000	1,19,380	2,85,511	3,07,469	3,17,198	3,16,569	3,15,928	3,26,981
(b) Percentage of charge stock processed to installed capacity .		39·79	95·17	102·49	105·73	105·52	105·31	108·99
Ethyl blending Plant								
(a) Feed stock processed	1,86,000		3,62,656	5,00,980	4,76,353	4,92,955	4,49,858	3,70,167
(b) Percentage of feed stock processed to installed capacity .	..	..	195·0	269·3	256·1	265·03	241·86	199·01

7.58. The processing capacity of each of the three Atmospheric Rerun Units was found to be 10 per cent more than the installed capacity.

7.59. The shortfall in production *vis-a-vis* the designed capaciy of AU. I. during 1966-67 and 1967-68, and AU. II in 1966-67 was mainly due to the units remaining idle on account of the problem of marketing the naphtha and low sulphur heavy stock (LSHS).

K. Production Performance—Udex Plant

7.60. The following table shows that actual production in the Plant since its commissioning in December, 1968 as against the rated capacity:—

In tonnes

	Rated Capacity	(Dec., 68 to Mar. 69)	Actual Production			
			1969-70	1970-71	1971-72	1972-73
Benzene	33,000	889	8,829	18,889	22,575	30,342
Toluene	14,000	651	1,561	3,222	3,757	7,580
Raffinate .	60,000	3,709	17,830	28,399	45,507	55,228
Loss . .	2,000	220	274	961	1,481	1,905
Total Throughput .	1,09,000	5,469	28,494	51,471	73,320	95,055

7.61. During the year 1969-70 (one full year after commissioning) the plant produced 28,220 tonnes of products, thus achieving 26 per cent of the installed capacity of 1,09,000 tonnes. The Management stated (July, 1970) as under:—

> "The plant operated depending upon the demand from the market for Benzene and Toluene given by our Marketing Division. Although the Refinery had given sufficient notice to the Marketing Division about the availability of these products, the customers have not come up as earlier expected. It is understood that the Steel Plants have also increased their Benzene production with the result that there is sevère competition in the market for this product and it is not possible to fix customers on a regular basis to the extent of our full production. Gujarat State Fertilizer Corp. were expected to lift about

15,000 tonnes of Benzene for their plant for the manufacture of Caprolactum which is still not ready."

7.62. During evidence the Managing Director explained the position as follows:—

"The decision to set up Udex plant was taken on the basis of expected supply of Benzene to the two major consumers companies, i.e. Caprolactum plant of Gujarat State Fertilizer Corporation and the Hindustan Organic Chemicals. These are the two main consumers, except two or three other consumers. There has been delay in the coming up of the Hindustan Organic Chemicals and the others. That is the reason, why we were not in a position to run the rated capacity."

7.63. The Committee enquired whether the production potential of Benzene, Toluene available in the steel plants of Hindustan Steel Ltd. was duly taken into account while taking the decision to set up Udex Plant in the Gujarat Refinery. It has been stated that:

"The production potential of Benzene, Toluene etc. from the steel plants was taken into account while taking a decision to set up the Udex Plant. The figures of production from the steel plants were very erratic and the supplies available in the market varied widely depending on the operating level of the steel plants and their internal requirements for gas production etc."

7.64. Asked whether the demand for Benzene and Toluene has since improved it was stated:—

"From next year, the demand of Benzene in the country will be such that we will not be able to supply the requisite quantity of benzene from our plant at Gujarat. There will be no problem from next year. The demand will be very high. We have in hand certain other schemes, whereby to produce 25 per cent excess than the designed capacity. We will be able to meet the demand better, if we are successful in that."

7.65. The Committee note that the Udex Plant was set up on the assumption that the Caprolactum Plant of Gujarat State Fertilizer Corporation, the Hindustan Organic Chemicals and two or three other industries would be able to absorb aromatic chemicals such as Benzene, Toluene etc. But the establishment of Caprolactum Plant and the Hindustan Organic Chemicals was very much delayed. The increased Benzene production in the Steel Plants further reduced the sale of Benzene from the Udex Plant. As a result the plant could achieve only 26 per cent of the

rated capacity during 1969-70. It has, however, gradually improved its performance during the subsequent years. During 1970-71, 1971-72 and 1972-73 it achieved 47.22 per cent, 67.27 per cent and 87.21 per cent of its rated capacity.

7.66. The Committee feel that the erection and commissioning of the Udex Plant should have been coordinated with the establishment of factories consuming Benzene and Toluane, so that there might be an assured market for the products of the Plant.

7.67. The Committee are informed that the Management have in hand a scheme to expand the capacity by 25 per cent. The Committee hope that the Corporation would profit by their experience and ensure adequate markets for Benzene and Toluene before undertaking the expansion scheme.

L. Stream Efficiency

7.68. The Project Report envisaged that the processing units would be on stream for 335 days in a year. The following table indicates the time during which the units were 'on stream, 'under maintenance' and 'idle' during the seven years ending 31st March, 1973:—

Year	On stream			Under Maintenance			Idle			On stream	Under maintenance	Idle
	ARU I	ARU** II	ARU** III	ARU I	ARU II	ARU III	ARU I	ARU II	ARU III		CRU*	
1	2	3	4	5	6	7	8	9	10	11	12	13
1966-67 .	227	284	..	3	7		135	16	..	163	4	..
1967-68 .	313·5	343·5	63	33	17·5		19·5	5	..	364	2	Nil.
1968-69 .	336·5	340·5	339	25	24·5	14	3·5		12	349·5	15·5	Nil.
1969-70 .	348·5	343·5	351	16·5	21·5	14	..	..	..	353	12	Nil.
1970-71 .	344·5	360·5	343	20·5	2·5	18		2	4	362	3	..
1971-72 .	357	343	350·5	9	23	15·5		..	..	354	12	..
1972-73 .	356·5	359	322	8·5	6·0	43	..	..	..	360	5	..

*The plant was commissioned in October, 1966.

**Atmospheric Re-run Units II and III were commissioned in June, 1966 and Sept., 1967 respectively.

M. Processing Cost

(a) Atmospheric Re-run Units and Catalytic Reforming Unit

7.69. The processing costs per tonne of crude oil throughput (Atmospheric Unit-wise) and charge stock (for the CRU) processed during the last six years 1967-68 to 1972-73 were as under:—

Year	Particulars	Atmospheric Unit-I	Atmospheric Unit-II	Atmospheric Unit-III	Catalytic Reforming Unit
1967-68	Total expenses (Rs. in lakhs) .	60·68	71·51	12·04	57·14
	Throughput/charge stock (tonnes in lakhs) . .	7·84	10·04	1·36	2·86
	Processing cost/tonne (Rs.) .	7·7	7·1	8·9	20·01
1968-69	Total expenses (Rs. in lakhs) .	66·72	65·96	42·75	58·31
	Throughput/charge stock (tonnes in lakhs.) . .	10·26	10·33	9·12	3·07
	Processing cost/tonnes (Rs.) .	6·5	6·4	4·7	18·97
1969-70	Total expenses (Rs. in lakhs) .	73·74	69·42	46·97	45·74
	Throughput/charge stock (tonnes in lakhs.) . .	12·29	11·80	10·08	3·17
	Processing cost/tonnes (Rs.) .	6·0	5·9	4·7	14·42
1970-71	Total expenses (Rs. in lakhs.) .	75·56	76·17	48·74	43·12
	Throughput/charge stock (tonnes in lakhs.) . .	12·02	12·37	10·44	3·17
	Processing cost/tonnes (Rs.) .	6·29	6·16	4·67	13·62
1971-72	Total expenses (Rs. in lakhs.)	75·35	71·64	50·58	41·19
	Throughput/charge stock (tonnes in lakhs.) . .	13·05	12·23	11·36	3·16
	Processing cost/tonnes (Rs.) .	5·77	5·86	4·45	13·04
1972-73	Total expenses (Rs. in lakhs) .	77·74	79·87	57·42	42·57
	Throughput/charge stock (tonnes in lakhs.) . .	13·48	13·99	10·03	3·27
	Processing cost/tonnes (Rs.) .	5·77	5·71	5·73	13·02

The processing cost per tonne has generally decreased with the increase in the quantum of throughput/charge stock.

Ethyl Blending Unit

7.70. The Project Report envisaged the operating cost of Rs. 8.34 lakhs (including the cost of chemicals estimated at Rs. 1.11 lakhs) for the operation of the plant at its installed capacity of 1.86,000 tonnes per annum.

7.71. The cost of operation, however, has been substantially lower mainly bedause of reduction in the quantity of utilities consumed and other expenses as indicated in the following table:

	As per Project Report		1967-68		1968-69		1969-70		1970-71		1971-72		@1972-73	
	Quantity in lakh tonnes	Cost per tonne	Quantity in lakh tonnes	Cost per tonne	Quantity in lakh tonnes	Cost per tonne	Quantity in lakh tonnes	Cost per tonne	Quantity in lakh tonnes	Cost per tonne	Quantity in lakh tonnes	Cost per tonne		
		Rs.		Rs.		Rs.		Rs.		Rs.		Rs.		
Quantity blended (tonnes) . .	1·86*		3·63		5·01		4·76		4·92		4·50		3·70	
Chemicals consumed (Rupees) .	1·11	0·59	4·34	1·20	15·40	3·07	11·17	2·34	24·12	4·90	24·73	5·50	34·53	9·33
Utilities and other expenses (Rupees)	7·23	3·89	0·89	0·24	0·97	0·19	1·09	0·23	1·41	0·28	1·03	0·23	1·10	0·30
	8·34	4·48	5·23	1·44	16·37	3·26	12·26	2·57	25·53	5·18	25·76	5·73	35·63	9·63

*Capacity is based on singels shi ft (6 hours) operation and can be increased depending upon the demand for the product.

7.72. It has been stated that the cost of operation per tonne during 1967-68 to 1969-70 was lower than the designed level mainly because of reduction in the quantities of utilities consumed and other expenses. The cost of operation during 1970-71 to 1972-73 was, however, higher due to substantial increase in the consumption of chemicals.

7.73. The consumption of chemicals during 1972-73 was more than 250% as compared with 1969-70. This was due to higher consumption of Chemicals (TEL). As catalytic reforming unit operated for higher quantity of udex feed, less reformate was available for MS blending which was compensated by more blending of TEL.

N. Consumption of Utilities

7.74. The requirement of fuel for the operation of the Refinery (about 73,000 tonnes of R.C.O. and 1,15,000 tonnes of fuel gas) is met by the Refinery from its own production. Power is generated in thermal unit of 24 MW capacity. Fresh water required for the operating units and the township is obtained from the nearby Mahi river.

7.75. The actual consumption of utilities and fuel as compared with the design figures in respect of atmospheric units I, II & III and udex plant for the year 1970-71 to 1972-73 are given below in the table:

Units	Fuel consumption % on throughput (standard Refinery Fuel)		Steam consumption MT/MT of throughput		Circulating water M3/MT of throughput		Elect. KWtt/MT of throughput		Compress Air M3/MT of throughput	
	Actual	Design	Actual	Design	Actual	Design	Actual	Design	Act.	Des.
AU I										
1972-73	3·8		0·02		13·82		4·88		1·80	
1971-72	3·8	4·4	0·02	0·044	16·22	22·3	5·32	4·1	1·86	1·4
1970-71	3·8		0·03		15·97		5·39		1·96	
AU II										
1972-73	3·8		0·02		14·44		4·76		1·76	
1971-72	3·8	4·4	0·02	0·044	15·80	22·3	5·05	4·1	1·90	1·4
1970-71	3·8		0·03		13·5		4·95		1·90	
AU III										
1972-73	3·0		0·02		12·68		3·79		1·77	
1971-72	3·0	3·7	0·01	0·090	10·84	16·0	3·76	5·6	1·71	3·5
1970-71	3·0		0·01		12·87		3·95		1·83	
Udex										
1972-73	10·3		0·05		68		18·8		17·12	
1971-72	11·8	9·9	0·06	0·36	64	58	19·2	30·8	17·0	N.A.
1970-71	13·1		0·06		89		24·4		22·6	

O. Production Targets and Achievements

7.76. Annual forecasts for production are made in the budget of the refinery indicating a target for crude input and production pattern for the ensuing year. These forecasts are stated to be based on the product demand intimated by the Marketing Division. The table below compares the actual production during the seven years ending 31st March, 1973 as against the targets set in the budget.

(in tonnes)

Name of the Product	1966-67			1967-68			1968-69			1969-70		
	Budget	Actual	Excess/ shortfall	Budget @	Actual	Excess/ shortfall	Budget	Actual	Excess/ shortfall	Budget	Actual	Excess/ shortfall
1. LPG	1500	..	(—)1500	..	421	..	8500	4553	(—)3947	13272	11098	(—)2174
2. Low octane Gasoline, Naphtha MS & MS 93 RON	372000	321011	(—)50989	..	381586	..	488200	598832	(+)110632	711541	696865	(—)14676
3. Middle distilates, ATF/JP-4, HSD SK and LDC	723600	724188	(+)588	..	987880	..	1441530	1526884	(+)85354	1693959	1708380	(+)14421
4. LSHS	269430	241418	(+)28012	..	360226	..	554370	606085	(+)51715	803383	742910	(—)60473
5. BENSENE & Toluene	..	..	..	..	..	..	14000	1309	(—)12691	17374	9769	(—)7605
TOTAL.	1366530	1286617	(—)79913	..	1730113	..	2506600	2737663	(+)231063	3239529	3169022	(+)70507

1. @Break up not available with the Management.

2. The figures of budgeted production are based on the revised estimats prepared by the company

7.77. The position during 1970-71 to 1972-73 is indicated in the table given be'ow:—

Name of the product	1970-71			1971-72			1972-73		
	Budget	Actual	Excess/ shortfall	Budget	Actual	Excess/ shortfall	Budget	Actual	Excess/ shortfall
1. L.P.G.	18269	18110	(—)159	27300	28253	(+)953	47000	48002	(+)1002
2. Low octane Gasoline Naphtha M.S. and M.S. 93 RON	700706	684208	(—)16498	689200	658885	(—)30315	692300	616111	(—)76189
3. Middle distillates ATF JP4 HSD SK and LDC	1681085	1691247	(+)10162	1787000	1824199	(+)37199	1835600	1852406	(+)16806
4. LSHS	821580	798111	(—)23469	896000	867405	(+)28595	962800	900790	(—)62010
5. Berene & Toluene . .	22981	21530	(—)1451	18600	26009	(+)7	33700	37623	(+)3923
Total .	3244621	3213206	(—)31415	3418100	34c4751	(—)13349	3571400	3454932	(+)116468

P. Variation in Product Pattern

7.78. In the Project Report for the two million tonnes capacity seven items of finished products were envisaged against which 13 times of finished products are now produced. Since the range of products envisaged in the Project Report is not being produced, it is not possible to state as to whether the product pattern now followed is favourable or otherwise as compared to that envisaged in the project report.

7.79. It was explained by the Management that the Refinery is not having any control over its product pattern and that the production is regulated in accordance with the projected demands.

7.80. There were deviations from the product pattern in the revised budget estimates which were prepared after taking into consideration the market demands, actual daily uplifts ullages available in the Refinery, changes in the blending ratios, specifications of the products and the units/parts of units operating in the Refinery at any particular time. The effect of deviation from the budgeted product pattern in terms of revenue gained or lost by the refinery is indicated below:—

Year	(Rupees in lakhs) Loss (—) /Gain(+) of revenue Pattern variance
1966-67	(—)96·90
1967-68	Not Worked out as the break-up of the various finished products provided for in the revised estimates was not available.
1968-69	(—)68·47
1969-70	(+)76·68
1970-71	(—)6·74
1971-72	(+)61·01
1972-73	(—)91 74

Q. Crude Intake

7.81 The crude intake as budgeted and the actual intake thereagainst with reference to installed capacity is given below:—

	1966-67	1967-68	1968-69	1969-70	1970-71	1971—72	1972-73
(1) Installed capacity	1840000	2300000	3000000	3000000	3000000	3000000	3000000
(2) Crude intake budgeted	1500000	1800000	2760000	3445681	3475704	3677000	3805100
(3) Crude actually processed (including sops)	1387235	1924648	2971607	3416597	3483127	3663744	3750250
(4) Increase(+)/decrease(—) over budgeted quantity.	(—)112765	(+)124648	(+)211607	(—)29084	(+)7423	(—)13256	(—)54750

7.82 The actual crude intake was less than the target in 1966-67 and 1969-70. The Management have attributed the following reasons for the shortfall:—

> "Variation from planned budgeted figure in all these years has been due to product demand position. The LSHS off-take from the refinery has been the governing factor in achieving the actual crude intake."

7.83 The shortfall in throughput during 1972-73 as compared to the budget was mainly due to less availability of North Gujarat crude.

R. Yield

7.84 The Project Report for the two million tonne capacity envisaged output of finished products at 89.6% of the intake in the case of Ankleswar curde and at 90% of Kalol crude. The following table indicates the yield percentage for the seven years ending 31st March, 1973:—

in tonnes

	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73
Intake (including slops)	1387235	1924648	2971607	3416597	3483127	3663644	3750250
High Octane gasoline	24467	—	—	—	—	—	—
Furnance Oil	—	5130	7485	7571	5516	3625	6652
Total	1411702	1929778	2979092	3424168	3488643	3667369	3756902
Total Output	1286617	1730113	2737663	3169022	3216980	3397969	3463943
Percentage Yield	91·1	89·7	91·9	92.5	92·21	92·65	92·20

7.85. The actual yeild was generally more than that anticipated in the Project Report. The relatively lower yield in 1967-68 has been attributed to high incidence of process loss which was 3.15% as against 1.73% to 2.04% in other years.

7.86. The Management have stated that in working out the yield in the above total during 1966-67 to 1969-70 the intermediate stock differential has not been included. This is also to be included to get the correct yield. The percentage yield would therefore require to be changed as under:—

1966-67	91·35
1967-68	89·73
1968-69	92·12
1969-70	92·40

7.87. It has been added that the refinery was supplying power to the Gujarat Electricity Board system to meet the shortage of power in the State by utilising the stand-by capacity available in the refinery's Thermal Power Station. The own fuel consumed for generating this extra power would normally have been available otherwise for sale as LSHS. If this is taken into account, the total yield would be as under:

1966-67	91·80
1967-68	90·77
1968-69	93·17
1969-70	93·44
1970-71	92·93
1971-72	93·98
1972-73	93·51

7.88. The reasons for achieving a higher percentage of yield than envisaged in the DPR are stated to be as under:

(1) Economy in the usage of own fuel.
(2) Reduction of power, steam and water and effecting control by technical auditing.
(3) Utilisation of more and more gas as own fuel resulting in less flare.
(4) Watching and controlling the losses arising at various points during storage, handling, loading operations etc.

7.89. The Committee note that Gujarat Refinery has been able to achieve a higher percentage of yield than envisaged in the Detailed Project Report by certain steps like economic in the usage of own fule, reduction of power, steam and water and effecting control by technical auditing, utilisation of more and more gas as own fuel resulting in less flare, watching and controlling the losses arising at various points during storage, handling, loading operation etc. The Committee recommend that the Corporation should consider taking similar measures in the other Refineries also so as to improve the operating efficiency and effect economy.

VIII

FINANCIAL POSITION AND WORKING RESULTS

A. Financial Position

8.1. The table below summaries the financial position of the three refineries under broad headings for the last seven years ended 31st March, 1973:—

(Rupees in lakhs)

	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73
Gauhati Refinery							
Liabilities :							
(a) Head Office account	1344·07	1367·26	1328·88	1267·41	1268·79	1188·46	1102·35
(b) Reserves and surplus	185·33	87·48	79·99	68·13	(—)23·76	37·87	72·78
(c) Borrowings :							
(i) From Govt. of India	..	..	..	..	..	..	..
(ii) Foreign credit	..	..	..	..	..	..	..
(iii) Cash credit	43·27	39·08	15·79	20·03	17·76	5·69	2·24
(d) Fixed deposit	..	0·80	..	..	..		
(e) Current liabilities and provisions (including provision for gratuity)	35·34	46·26	44·73	55·65	72·05	72·79	82·80
Total	1608·01	1536·88	1469.39	1411·22	1334·84	1304·81	1260·17
Assets							
(f) Gross block	1495·58	1514·89	1520·71	1521·69	1535·55	1538·65	1554·67
(g) Less : Depreciation	193·90	262·97	332·34	401·50	473·91	544·59	616·78
(h) Net fixed assets	1301·68	1251·92	1188·37	1120·19	1061·64	994·06	937·89

(i) Capital work-in- progress (including unallocated capital expenditure and material at site)	63·80	57·72	61·07	53·75	50·16	60·87	54·07
(j) Capital goods in store and in -transit	10·44	9·99	4·51	4·02	3·29	4·76	6·97
(k) Construction period expenses pending allocation	..	..	..		..	..	..
(l) Investments	0·53	0·30	0·65	1·05	1·02	0·10	1·10
(m) Current assets, loans and advances (including inter-unit balances).	231·56	216·95	214·79	232·21	218·73	245·02	261·14
TOTAL	1608·01	1536·88	1469·39	1411·22	1334·84	1304·81	1260·17
Capital employed	1497·90	1435·22	1372·46	1313·74	1233·13	1193·81	1149·27
Barauni Refinery							
Liabilities							
(a) Head Office account	4867·41	4717·06	4783·13	4450·97	4309·69	3978·15	4031·83
(b) Reserves and surplus	..	67·20	22·31	172·99	170·54	343·93	277·98
(c) Borrowings :							
(i) From Govt. of India		..	..	..	..	..	..
(ii) Foreign credit	..	..	..	..	..	..	..
(iii) Cash credit	69·84	20·58	28·65	44·23	38·05	19·08	
(d) Fixed deposit	..	1·37		..	..	..	
(e) Current liabilities and provisions (including provision for gratuity).	120·73	165·34	155·03	231·66	274·44	270·9	277·51
TOTAL	5057·98	4971·55	4989·12	4899·85	4792·72	4612·14	4587·32

	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73
Assets							
(f) Gross block .	4166·82	4683·69	4978·79	5071·79	5125·26	5289·42	5340·76
(g) Less : Depreciation	361·63	543·83	756·56	977·01	1201·93	1430·84	1658·11
(h) Net fixed assets . . .	3805·19	4139·86	4222·23	4094·78	3923·33	3858·58	3682·65
(i) Capital work-in-progress (including unallocated capital expenditure and material at site)	439·55	201·66	44·30	121·05	155·80	33·68	27·16
(j) Capital goods in store and in-transit . .	12·40	13·24	16·58	9·73	10·41	8·85	6·28
(k) Construction period expenses pending allocation	159·83	85·42	51·42	22·20	16·83	5.94	0·45
(l) Investments	0·21	0·39	0·61	0·61	0·61	0·28	0·27
(m) Current assets, loans and advances (including inter-unit balances)	562·03	530·98	653·98	651·48	685·74	704·81	870·51
(n) Net loss	78·77						
TOTAL . .	5057·98	4971·55	4989·12	4899·85	4792·72	4612·14	4587·32
Capital employed	4246·49	4514·46	4735·27	4540·76	4375·23	4343·36	4324.24
Gujarat Refinery							
Liabilities							
(a) Head Office account	2841·21	2705 96	2631·46	2386·55	2507·92	1888 .94	1820·25
(b) Reserves and surplus . . .	61·58	220·49	342·13	431·01	168·34	725·43	643·31

(c) Borrowings :							
(i) From Govt. of India							
(ii) Foreign credit							
(iii) Cash credit	102·46	88·91		19·80	19·93	15·63	12·17
(d) Fixed Deposit	..	1·08	..				
(e) Current liabilities and provisions (including provision for gratuity)	121·19	120·20	126·35	118·55	126·97	136·70	148·81
TOTAL	3126·44	3136·64	3099·94	3005·91	2823·16	2766·70	2624·54
Assets							
(f) Gross block	2577·80	2831·53	3038·39	3069·31	3102·64	3104·86	3127·92
(g) Less : Depreciation	153·16	280·00	411·11	550·62	693·15	827 01	960·05
(h) Net fixed assets	2424·64	2551·53	2677·28	2518·69	2409·49	2277·85	2167·87
(i) Capital work-in-progress (including unallocated capital expenditure and material site)	338·14	187·16	14·69	7·02	6·65	17·63	19·22
(j) Capital goods in store and in-transit	11·16	6·69	5·03	11·14	2·48	1·45	1·89
(k) Construction period expenses pending allocation	14·74	17·94	..	..	..	..	..
(l) Investments	1·28	1·98	1·25	1·25	1·25	0·35	0·35
(m) Current assets, loans and advances (including inter-unit balances	336·48	371·34	451·69	467·81	403·29	469·42	435·21
TOTAL	3126·44	3136·64	3099·94	3005·91	2823·16	2766·70	2624·54
Capital employed	2639·93	2804·21	2957·93	2877·70	2703·46	2634·59	2481·76

B. Working Results

8.2 The working results of the three refineries for the last seven years ending 31st March, 1973, are tabulated below:—

(Rupees in lakhs)

	1966—67	1967—68	1968—69	1969—70	1970—71	1971—72	1972—73
Gauhati							
Net profit (before tax)	113·53	77.76	79·99	68·13	(—)23·76	37·87	72·78
Percentage of net profit to capital employed	7·58	5·42	5·83	5·19	Negative	3·17	6·33
Barauni							
Net profit (before tax)	34·07	69·06	22.31	172·99	170·54	343·93	277·98
Percentage of net profit to capital employed	0·80	1·53	0·47	3·81	3·90	7·92	6·43
Gujarat							
Net profit (before tax)	77·28	224·51	342·13	481·01	168·34	725·43	643·31
Percentage of net profit to capital employed	2·93	8·01	11·57	16·72	6·23	27·53	25·92
Total							
(i) Net profit	224·88	371·33	444·43	722·13	315·12	1107·24	994·07
(ii) Capital employed	8384·32	8753·89	9965·66	8732·20	8311·82	8171·76	7955·27
(iii) Percetage of net profit to capital employed	2·7	4·2	4·9	8.3	3·8	13·5	12·5

NOTES :—1. The figures of net profit and the capital employed of the three refineries as mentioned above are exclusive of the figures relating to the purchase and clearing offices at Bombay and Calcutta and the Head Office at New Delhi.

2 The net profit for Gauhati and Barauni refineries for 1969-70 excludes the enhanced price paid for the crude oil supplied by the Oil India Limited during the period from 1st January, 1970 to 31st March, 1970 as a result of Government decision taken in March, 1971 as payment was made only in 1970—71

3 The net working results of the three refineries are based on the price actually paid to the ONGC for the crude supplied and do not take into account the liability that has accrued on account of the fixation of the price finally.

4 The net profits shown above are after adjustment of prior period income and expenditure.

8.3 If the expenses relating to the purchase to and clearing offices at Bombay and Calcutta and the Head Office at New Delhi and also the assets pertaining to them are taken into account the position of the Refinery Division as a whole during the last 7 years would be as follows:—

(Rupees in lakhs)

	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73
Capital employed	10841·19	11416·18	11547·81	11191·84	10398·39	9347·69	6672·62
Net profit before tax	151·06	346·70	412·08	679·26	264·51	1028·86	916·75
Percentage of net profit to capital employed	1·4	3·0	3·6	6·1	2·5	11·01	13·74

NOTE:— The capital employed excludes the expenditure on Haldia Refinery Project under construction.

The percentage share of each refinery in the total net profits and the total capital employed of the Refineries Division during the last seven years is indicated below :—

	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73
Gauhati	%	%	%	%	%	%	%
Capital employed	17·9	16·4	15·1	15·0	14·8	14·6	14·4
Net profit before tax	50·5	20·9	18·0	9·4	(—)7·5	3·4	7·3
Barauni							
Capital employed	50·6	51·6	52·2	52·0	52·7	53·2	54·4
Net profit tax	15·2	18·6	5·0	24·0	54·1	31·1	28·0
Gujarat							
Capital employed	31·5	32·0	32·7	33·0	32·5	32·2	31·2
Net profit before tax	34·3	60·5	77·0	66·6	53·4	65·5	64·7

C. Supply of Crude Oil by Oil India Limited to Gauhati and Barauni Refineries

8.4. The price paid for crude oil by the Indian Oil Corporation Limited is based on import parity price and not the actual price that was paid to the Oil India Limited in accordance with the Agreement with Government of India. In view of the low off-take of crude by the Indian Oil Corporation Limited, from Oil India Limited, the Government of India paid by way of retrospective price adjustment during the years 1962—67 and termed as 'subsidy' a sum of Rs. 1687.38 lakhs. In addition, a sum of Rs. 294.45 lakhs was paid by the Government as sales-tax during the same period. The total of both these amounts is Rs. 2081.83 lakhs. The sales tax is payable by the purchaser of crude oil in accordance with clause 9(D) of the second supplemental Agreement (1961) between the Government of India and the Burmah Oil Company.

8.5. Subsequently, due to increase off-take of crude by the two Refineries of the Indian Oil Corporation Limited during 1967 to 1970, the price discount received by Government from the Oil India Limited for the crude oil purchased by the Government amounted to Rs. 644.09 lakhs. Of this amount, a sum of Rs. 462.48 lakhs was paid as sales tax on crude purchased from the Oil India Limited during 1967-70 and the balance of Rs. 181.01 lakhs was credited to Government account in cash.

8.6. Asked about the position during 1971 to 1973 the Ministry stated as follows:—

> "The accounts of Oil India Ltd. for the years 1971 and 1972 have not been finalised as yet. According to the provisional accounts, Government is likely to receive as price discount from OIL Rs. 424.41 lakhs for 1971 and Rs. 166 lakhs for the year 1972. Of these sums, sales tax amounting to Rs. 122.71 lakhs for 1971 and Rs. 135 lakh for 1972 has already been paid. Out of the balance amount of Rs. 332.70 lakhs, a sum of Rs. 3.25 crores has been received in cash, pending final adjustment of accounts.
>
> It is not feasible to indicate at this stage the amount to be received by the Government as price adjustment for the year 1973. On present indication, this amount would be higher than the amount receivable for the year 1972."

D. Non-settlement of Price of ONGC crude oil

8.7. The Oil and Natural Gas Commission is supplying crude oil from its Ankleswar fields to the Gujarat refinery since the commencement of

production in October, 1965. No agreement could, however, be reached between the Company and the ONGC regarding the price to be paid for the crude oil supplied on account of difference of opinion with regard to escalation, conversion factor, ocean freight and exchange rate. The matter was ultimately referred to arbitration.

8.8. According to the award given on 10th June, 1971, the extra financial burden was as follows:—

(Rs. in lakhs)

Refineries	1966-67	1967-68	1968-69	1969-70	1970-71
Gauhati	--	--	--	0.99	3.95
Barauni	--	--	--	--	16.91
Gujarat	43.44	74.59	46.88	71.53	111.44

8.9. The Committee enquired whether the necessary adjustment on this account had been carried out in the accounts of the respective refineries. In a written reply, the Ministry stated as follows:—

> "Necessary adjustments on this account have already been carried out in the accounts of the respective refineries upto 1970-71.
>
> From 10th June, 1971 onwards, IOC are making payments according to the award. Since the refineries are implementing the award from 10th June, 1971 onward, the question of adjustment from 1971-72 onwards would not arise."

E. Refiners Margin *vis-a-vis* Expenditure Incurred

8.10. The following table indicates the total Refiner's margin, total expenditure incurred, Refiner's margin, expenditure and net profit per tonne of crude processed and the percentage of total expenditure to total Refiner's margin in the three Refineries at Gauhati, Barauni and Gujarat during the years 1966-67 to 1972-73:—

Particulars	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73
A. Gauhati Refinery							
1. Throughput (including slops) . .	7,62,611	8,32,818	8,20,053	7,84,571	6,95,226	8,07,398	8,06,123*
2. Total Refiner's margin (in lakhs of Rs.)	318.32	301.41	317.56	322.25	265.38	301.04	360.30
3. Total expenditure (in lakhs of Rs.)	212.18	232.07	247·00	258·66	289·56	287·40	304.54
4. Refiner's margin per tonne (Rs. per tonne) .	41·74	36·19	38·72	41·07	38·17	37·29	44·70
5. Expenditure in rupees per tonne . . .	27·82	27·86	30·12	32·96	41·65	35·60	37·78
6. Net profit in rupees per tonne (including miscellaneous receipts)	14·89	9·34	9·80	9·46	(—)1·45	4·18	9·51
7. Percentage of expenditure to Refiner's margin	67	77	78	80	109·11	95·47	84·53
F. Barauni Refinery							
1. Throughput (including slops) .	11,46,417	16,58,760	17,90,804	21,11,944	22,18,955	23,09,205	24,26,344
2. Total Refiner's margin (in lakhs of Rs.)	515·32	646·83	670·42	923·35	983·36	1,089·24	1,077·32
3. Total expenditure (in lakhs of Rs.)	491·96	586·85	652·28	748·44	763·48	784·16	849·60
4. Refiner's margin per tonne (Rs. per tonne) .	44·95	38·99	37·44	43·72	44·32	47·17	44·40
5. Expenditure in rupees per tonne . . .	42·91	35·38	36·42	35·44	34·41	33·96	35·02
6. Net profit in rupees per tonne (including miscellaneous receipts) . . .	12·97	4·16	1·62	8·86	10·64	14·45	10·85
7. Percentage of expenditure to Refiner's margin	95	91	97	81	77·64	71·99	78·86

Particulars	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73
C. Gujarat Refinery							
1. Throughput (including slops) . .	14,11,702@	19,29,778**	29,79,092**	34,24,168**	34,88,643**	36,67,369**	37,56,902**
2. Total Refiner's margin (in lakhs of Rs.)	417·13	534·35	718·25	824·01	801·44	1,005·29	1,052·36
3. Total expenditure (in lakhs of Rs.)	360·48	357·60	417·62	415·68	450·89	453·63	515·76
4. Refiner's margin per tonne (Rs. per tonne) .	29·55	27 69	24·11	24·06	22·97	27·41	28·01
5. Expenditure in rupees per tonne . . .	25·54	18·53	14·02	12·14	12·92	12·37	13·73
6. Net profit in rupees per tonne (including miscellaneous receipts) . . .	5·47	11·63	12·28	14·05	11·73	17·71	16·91
7. Percentage of expenditure to Refiner's margin	86	67	58	50	56·26	45·12	49·01

*Excludes 184 tonnes transferred from crude oil tank to reduced crude stock,

@Includes High Octane Gasoline (24,467 tonnes) purchased from M/s. Burmah Shell.

**Includes furnace oil purchased for blending with LDO, during 1967-68 (5,130 tonnes), 1968-69 (7,485 tonnes), 1969-70 (7,571 tonnes) 1970-71 (5,516 tonnes), 1971-72 (3,625 tonnes) and 1972-73 (5,652 tonnes).

8.11. The reasons for variations in the working results of the three refineries are discussed below:—

(a) **Gauhati Refinery**

8.12. It is seen that in Gauhati Refinery the percentage of expenditure to refiner's margin which was showing an upward trend from 1966-67 was the highest in 1970-71 when the actual expenditure even exceeded the refiner's margin. During the years, 1970-71, the Refinery incurred a loss of Rs. 23.76 lakhs as against a profit of Rs. 68.13 lakhs made during 1969-70. The following factors were stated to be responsible for the deteriorating trend in Gauhati Refinery during 1970-71.

"1. The lower throughput during the year 1970-71 the reasons for which are given below:—

(a) Unsteady and interrupted power supply from ASEB when the refinery's turbo-generators were under capital maintenance one by one from April, 1970 to December, 1970.

(b) During July, and August, 1970, there was product upliftment difficulty at Siliguri due to railway strike resulting in ullage problems at the refinery.

(c) Lower supplies of crude oil from OIL during the winter period of the year mainly due to Limitations of plunger capacity at Moran Pump Station. The reduction in profit on account of this is Rs. 33 lakhs.

2. The price of crude oil was increased with effect from 1-1-1970 as a result of adoption of medium range tanker freight rates as against large Range II tanker freight rates adopted by IOC in the price build up. The amount due for the period 1-1-1970 to 31-3-1970 on account of enhanced rate of crude oil was also provided in the accounts for 1970-71. The profit was reduced by Rs. 43 lakhs on these accounts.

3. Import of power from ASEB during the overhaul of turbines (Rs. 6 lakhs).

4. Upward revision in the salaries of officers and staff as a result of agreement (Rs. 26 lakhs)."

8.13. As regards increase in expenditure as percentage of Refiner's margin in 1971-72 and 1972-73 as compared to 1969-70, it was stated that the basis of payment for crude oil changed from 1-1-70 the effect of which was felt from '70-'71 and onwards thus reducing the margin. The increase in establishment expenses due to negotiated settlement was also

effective from 1970-71 onwards. In the circumstances and in the absence of any significant difference in crude throughput, the percentage of expenditure to Refiner's margin was lower in 1971-72 and 1972-73 as compared to 1969-70.

(b) Barauni Refinery

8.14. The Barauni Refinery made a profit of Rs. 277.98 lakhs during 1972-73 as against profit of Rs. 343.93 lakhs during the previous year. About the reasons for the decline in profit the Ministry stated as follows:—

> "During 1972-73 the refinery processed 129,514 tonnes of imported crude, FOB price of which was US $ 1.770 per barrel upto November, 1972 $ 1.97 during December, 1972 and $ 2.041 from January, 1973. The cost of transportation (which incidentally included the cost incurred towards lightening of the vessel to meet Haldia draught and engagement of Daughter vessel) was very much higher than the then prevailing world scale rate adjusted for monthly AFRA. As against this crude price, the product prices applicable during the above period were based on a crude price of 1.48 dollars. This has affected the profitability of the refinery to the extent of about Rs. 90 lakhs."

(c) Gujarat Refinery

8.15. It is seen that there was a sharp increase in the percentage of expenditure to the Refiner's margin during 1970-71 in the Gujarat Refinery. The Refinery made a profit of Rs. 168.34 lakhs during 1970-71 as against a profit of Rs. 481.01 lakhs made during the previous year. In regard to the shortfall in profits during this year, it was stated as follows:—

> "Gujarat Refinery had to provide a liability of Rs. 245 lakhs in the accounts for 1970-71 towards increase in the price of crude oil arising out of an award by the Arbitrator.
>
> If this amount is adjusted against the profits of the respective previous years and 1970-71, the trend will not appear as adverse.
>
> Increase in the salaries of officers and staff as a result of agreements. (Rs. 24 lakhs)."

8.16. If the effect of the prior year adjustment is eliminated in the year 1970-71 percentage of expenditure to Refiner's margin would be 56. The percentage in 1971-72 works out to 45 after eliminating prior year adjustments. The reduction in the percentage of expenditure to Refiner's margin in 1971-72 as compared to 1970-71 is due to increase in the margin arising out of better transfer price, expenditure remaining more or less at the same level.

8.17. The Committee enquired about the reasons for the expenditure per tonne of crude processed in Gauhati and Barauni Refineries being much higher than in Gujarat Refinery and for being highest in Barauni as compared with other Refineries.

In a written reply the Management stated as follows:—

"There are several factors which vitiate interunit comparison. These may be broadly stated as follows:—

(i) Complexity of the refinery—depending upon quality of crude processed, secondary processing units installed and the end products desired.

(ii) Capacity of the Refinery.

(iii) Location of the refinery, and

(iv) Capacity utilisation.

8.18. In addition to the above factors, it was added that the import parity price for crude oil for Gujarat Refinery was based on LRI tanker freight rates while for Gauhati and Barauni, it was on medium range tanker freight rates which was higher."

F. Working of IOC Refineries as compared to other Refineries

The table below indicates the operating cost and the recovered products for 100 tonnes of crude processed in the public and private sector refineries:—

Refinery	Recovered Products (Tonnes)	Operating Cost (Rupees)
Gujarat 1972-73	92·7	1,118
Caltex 1971	91·4	1,833
Cochin 1971-72	94·4	2,802
Burmah Shell 1972	93·8	3,364
Barauni 1972-73	91	3,403
Gauhati 1972-73	90	3,573
Madras 1971-72	88·7	3,536
Esso 1972	95.0	3,597

Note : 1. Source of Data :

(i) The total yield of products per 100 tonnes of crude for refineries other than 100 has been taken from Indian Petroleum & Chemical Statistics of 1972 the publication of Ministry of Petroleum and Chemicals.

(ii) The operating cost data has been tabulated from the Annual Reports of the refineries concerned for the year indicated.

2. Operating cost of MRL, CRL, ESSO, Caltex and Shell includes the cost of packingof Bitumen.

8.19. In this connection the Management stated that:—

"The yield of IOC refineries and Madras Refinery is lower mainly because of the fuel used for own power generation. Gujarat Refinery is also supplying power to State Electricity Board and a part of fuel as used towards production of this electricity. Liquid products recovery at Gauhati is low since a part of the fuel gas has to be flared so that the undisposable residue could be burnt in the furnaces.

Madras Refinery Ltd. and Barauni Refinery have Lube Plant which need high investment and the cost of operation of Lube block leads to higher operation cost of the refinery per 100 tonnes of crude. Gauhati Refinery has high operating cost mainly because of its low capacity."

8.20. During evidence, the Committee enquired about the comperative efficiency between the private sector refineries and IOC refineries. The Managing Director stated as follows:—

"Comparison can be done only on a few points not on profit. I would like to say that the comparison will be telling whether we are running efficiently or not, whether downtime of the units had been reduced, the operational efficiency as regards the yield of the refinery has been increased? If you see all our reports you will find in the last three years our total yield from the refinery has gone up. These are the few factors where we see that we are doing things in the right direction. In the Project Report you will find that for the Gujarat Refinery they have given only 90 per cent recovery whereas we have achieved 93 per cent recovery by taking all the actions. Similarly in Barauni we have improved from 89 per cent. to 91 per cent. recovery by reducing the losses and improving the yields. It is very difficult to answer the other question with regard to the comparison of efficiency with private sector refineries." He, however, added that "it will take a few more years to come to their standards. That I admit."

8.21. As regards scope for improvement in the IOC refineries, the Managing Director stated as follows:—

"I myself do not consider just because we are making profit we are running most efficiently when we find lot of improvements have yet to be done both in operation as well as in maintenance so that we can increase the onsteam days of the plant, we can reduce the break down of the plant as well as we can increase the profitability of the units. We have seen

our main problems—maintenance problem, wrong operation, erosin|corrosion or failure of the metals etc. Our endeavour now is wherever these things have failed we should look into all possible angles and also whether the plants have been run as per the normal procedure and as per normal temperature. We have found that in all our refineries this has been happening. Maintenance problem was created because plant was not run properly, corrosion problem was not tackled in time. The problem of corrosion is such that it will not be noticed in the first one or two years. We are trying to solve this problem more on technological oriented basis than previously done just on crash basis.

We have taken up certain schemes. We have also started a Central Service Organisation to give advice to the units on all problems. There are quite a few problems not known to the local units. Some of the problems are referred to not only from their experience but they get expert advice from outside. We try to give proper advice so that we can take corrective action in time to reduce the breakdown and ultimately we can keep the plants running more than what has been specified in the Project Report.

We have taken a lot of action about the cost control by introducing technical auditing system. That means norms and standard should be fixed and that should be adhered to. We have introduced it only in one refinery and we are gradually introducing the system in other refineries."

8.22. The Committee find that the profitability of the three refineries varied widely from year to year. In some years the fluctuations in the working results are quite disconcerting. Gauhati Refinery suffered a loss of Rs. 23.76 lakhs during 1970-71 as against a profit of Rs. 68.13 lakhs during the previous year. Lower throughput, fixation of higher price for crude due to adoption of medium range tanker freight rates, import of power from the Assam Electricity Board due to capital maintenance of refinery's own turbo-generators are stated to be the reasons for the loss during 1970-71. During 1971-72 and 1972-73 the Refinery made a profit of Rs. 37.87 lakhs and Rs. 72.78 lakhs respectively.

8.23. Barauni Refinery made a profit of Rs. 170.54 lakhs, Rs. 343.93 lakhs and Rs. 277.98 lakhs during the years 1970-71, 1971-72 and 1972-73 respectively. The decline in profit during 1972-73 as compared to 1971-72 was due to higher price paid for the imported crude.

8.24. Gujarat Refinery made a profit of Rs. 168.34 lakhs, Rs. 725.43 lakhs and Rs. 643.31 lakhs during the years 1970-71, 1971-72 and 1972-73 respectively. The shortfall in profits during 1970-71 was due to liability of Rs. 245 lakhs towards increase in the price of crude oil arising out of an award by the Arbitrator.

8.25. The Committee also find that the expenditure per tonne of crude processed in Gauhati and Barauni Refineries was much higher than in Gujarat Refinery. In case of Gauhati Refinery it was Rs. 41.65, Rs. 35.60 and Rs. 37.78 during the years 1970-71, 1971-72 and 1972-73 respectively and for Barauni it was Rs. 34.41 Rs. 33.96 and Rs. 35.02 respectively as against Rs. 12.92, Rs. 12.37 and Rs. 13.73 respectively for the Gujarat Refinery. The operating cost in the Gauhati and Barauni Refinery was also much higher than the Gujarat Refinery. As against the operating cost of Rs. 1,118 per 100 tonnes of crude processed in the Gujarat Refinery during 1972-73, the operating cost in the Gauhati & Barauni Refineries was Rs. 3,573 and Rs. 3,403 respectively. The recovery of products in the Gauhati and Barauni Refineries was 90 and 91 tonnes as compared to 92.5 tonnes in Gujarat Refinery. The yield in the ESSO, Burmah Shell and Caltex Refineries was 95.0, 93.8 and 91.5 tonnes respectively.

8.26. It has been stated that there are several factors which vitiate comparison between different refineries with regard to profitability as it was dependent upon several variable factors such as location and capacity of the Refinery, quality of crude processed, capacity utilisation and the price of crude etc. The Management have, however, admitted that there is need for making lot of improvement in the working of the IOC refineries and that it would take a few more years for the IOC refineries to come to the standard of refineries in the private sector. The Committee are informed that a Central Service Organisation has been set up to give advice on ways and means to improve the service and a Technical Audit Cell is examining the consumption pattern of various fuels, chemicals and utilities in order to fix norms for the different Units in the refineries. The Committee hope that with the assistance of the Technical Audit Cell and Central Service Organisation, it would be possible to effect economies in operating costs, attain maximum recovery and increase the profitability of the refineries in the coming years.

MATERIAL MANAGEMENT AND INVENTORY CONTROL

A. Closing stock of Inventories

9.1 The following table indicates the purchases made during the year, consumption and the closing balance of stores and spares for the last seven years in respect of the thre refineries:—

(a) *Gauhati Refinery*

	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73
1. Closing balance at the end of the year (Rs. in lakhs)	110·96	111·59	116·39	128·22	124·09	128·75	147·43
2. Consumption during the year (Rs. in lakhs)	45·47	37·95	42·57	43·92	49·17	50·11	45·75
3. Closing balance in terms of months consumption	29	35	33	35	30	31	39
4. Purchase (Rs. in lakhs)	35.4	38·58	47·37	50·79	41·02	54·77	64·43

(b) *Barauni Refinery*

	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73
1. Closing balance at the end of the year (Rs. in lakhs)	304·05	302·50	352·72	371·08	355·26	376·40	368·75
2. Consumption during the year (Rs. in lakhs)	72·65	99·88	126·31	131·76	174·06	168·32	170·83
3. Closing balance in terms of months consumption	50	36	34	34	24	24	26
4. Purchases (Rs. in lakhs)	240·78	98·34	176·53	150·12	164·75	211·34	163·12

(c) *Gujarat Refinery*

	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73
1. Closing balance at the end of the year (Rs. in lakhs)	84·42	147·83	176·38	184·49	177·48	195·88	220·98
2. Consumption during the year (Rs. in lakhs)	115·64	81·04	100·00	93·44	76·84	69·44	110·3(
3. Closing balance in terms of months consumption	9	22	21	24	27	34	24
4. Purchases (Rs. in lakhs)	72·13	111·46	118·46	79·64	69·83	87·85	134·08

NOTE :—At Gahauti, the value of stores and spares include that of chemicals. At Barauni, the value of stores and spares includes that of chemicals and loose tools.

9.2. In regard to the existence of stores in excess of the requirement the Management have stated as follows:—

"The refineries were forced to carry over in stock items of left over construction materials which were supplied by the foreign collaborators in excess of our requirements to overcome any eventuality. We are making efforts as part of stores reorganisation work to segregate those materials into items that will be required in the refinery itself, items that are not required but may be used in other refineries which are under construction and items that will not be required and have to be disposed of. As these are in the nature of specialised equipments used in the petroleum refining industry we do not expect many people to purchase these surplus items. Every effort will be made to dispose them of as quickly as possible after the above segregation is over."

B. Surplus Stores

9.3. The position regaring disposal of surplus material as on 31st March, 1973 is as under:—

(Rs. in lakhs)

	Gauhati	Barauni	Gujrat	Total
1. Value of stores disposed of during the last 3 years	0.55	12.18	11.23	23.96
2. Stores transferred to other units	1.25	14.33	7.74	23.32
3. Stores for which disposal action is in progress	3.21	11.73	11.07	26.01
4. Stores which have been recently found surplus for disposal and for which disposal action has yet to be started	10.28	18.06	.....	28.34
	15.29	56.30	30.04	101.63

C. Fixation of Minimum and Maximum Limits

9.4. The position regarding the fixation of minimum and maximum limits in the three refineries as on 31st March, 1973, is as follows:—

Gauhati:—Out of 9978 items on inventory, limits have been fixed for 645 items (spares for pumps, compressors etc. not included).

Barauni:—Out of 16405 items standardised and codified limits have been fixed for 7329 items.

Gujarat:—Out of 11086 items, 5204 have been taken on Inventory Control.

D. Physical Verification of Stores and Spares

9.5. According to the prescribed procedure, all items of stores and spares are required to be verified at least once during the course of a financial year. The position with regard to physical verification of stores in the three refineries during 1970-71 to 1972-73 was, however, as follows:—

Refinery	Year	No. of items on the Inventory	No. of items physically verified	Percentage
Gauhati	1970-71	9858	4199	42·6
	1971-72	10140	2346	23·1
	1972-73	9978	2107	21·1
Barauni	1970-71	17229	Nil	Nil
	1971-72	17305	2989	17·3
	1972-73	16406	258	1·6
Gujarat	1970-71	9239	448	4·8
	1971-72	10090	1084	10·7
	1972-73	11086	6445	58·1

9.6. The Management have fixed (from 1972-73) the following norms for physical verification:—

A Category items	twice every year
B Category items	Once every year
C Category items	Once in three years.

9.7. The Committee enquired whether the physical verification was being done in all the refineries according to the norms fixed by the Management. It was stated that "norms for physical verification of A, B and C items were laid down by Management in August, 1972 and as such it is expected that the progress of this work will be better in the current year."

E. Stores and Purchase Procedure

9.8. The existing stores and Purchase Procedure was adopted by the Board of Directors of the Indian Refineries Ltd. in 1958. With the growth of the organisation of the Indian Oil Corporation Ltd. (Refineries Division) it was considered necessary to streamline Stores & Purchase Procedure so as to remove any lacunas or deficiencies which may have been felt in actual use of existing stores and Purchase Procedure. Besides, the above procedure had been framed to suit the construction work requirements which needed to be changed to meet the operational requirements of the Units. One of the Controllers of Stores and Purchases was accordingly entrusted with the task of compiling draft stores and purchase procedure in October, 1965. He presented his first draft report for discussions in the meeting of controllers of stores and purchases and Chief Accounts Officers held in March, 1968. In this meeting it was decided that Controllers of Purchases of all Units should meet in April, 1968 and frame a common acceptable stores and purchase procedure. The draft was finalised by them sometime in 1969. In January, 1969 a decision had however been taken by the Board of Directors to appoint Messrs. A. R. Palit & Co. as consultants for streamlining of materials Department at Barauni. Later the same firm was appointed to undertake the follow up work on the implementation of their various recommendations. One of the terms of reference of their assignment was to draw up a Purchase Policy and Procedure Manual. In view of the above the procedure prepared by Controller of Purchases was handed over to Messrs. A. R. Palit & Co. for their examination.

9.9. The firm after exchange of views and examining the draft manual submitted finally their draft in September, 1970. This draft was circulated to all the Controllers of Purchases for their views. The views of the Units were received by May, 1971 in which they expressed several points of disagreement with the procedure prepared by M/s. A. R. Palit & Co.

9.10. The Controller of Purchases suggested holding of a meeting at Delhi to discuss the above procedure in the light of the guidelines of Bureau of Public Enterprises on this subject which also had been received by this time. The meeting could materialise in July, 1972 and the draft finalised in this meeting was submitted to the Board for approval in January, 1973. The Board after consideration of the matter decided that

Managing Director (Refineries and Pipeline) and Finance Director may go into the item and place before the Board any matters of policy involved needing Board's attention and approval. It has been stated that "the matter is presently under examination with Finance Director."

9.11. The Committee find that during the years 1966-67 to 1972-73, the value of the stores held in stock varied between 29 to 39 months consumption, 24 to 50 months consumption and 9 to 34 months consumption in the Gauhati, Barauni and Gujarat Refineries respectively. Purchases have also been in excess of the consumption of stores judged from their value. The Committee find that maximum and minimum limits have been fixed only for 645 items out of 9978 items in Gauhati, 7329 items out of 16406 in Barauni and 5204 items out of 11086 items in Gujarat. The Committee regret to note that even now the construction materials have not been completely segregated from those required for operation and that surplus stores worth Rs. 54 lakhs are still being carried by the refineries. Physical verification of stores was not done in the three refineries according to the prescribed procedures. Though such a verification is required to be done annually, it was not done at all in Barauni during 1970-71 and only 1.6 per cent of the work was done in 1972-73. The Committee are surprised to note that the management fixed norms for physical verification only in August, 1972 and the work of physical verification according to those norms is still in progress.

9.12. The Committee further note that although the Management decided to streamline the stores and purchase procedure in 1965 and the Controller of Stores and Purchases was entrusted with the task of compiling stores and procedure in October, 1965, it was only after three years in 1968 that a draft was produced and even after it was finalised in 1969, a firm of consultants appointed for streamlining the Materials Department at Barauni was asked to draw up a Purchase policy and Procedure Manual. Though a draft manual was given by the consultants in September, 1970 this was finalised in January, 1973 and is now stated to be under the examination of Finance Director to whom it was referred to by the Board. The Committee feel concerned about the inordinate delay of over 8 years in evolving comprehensive stores and purchase procedure. The Committee recommend that the Manual should be finalised without any further delay and the entire procedure of Stores and Stock control should be streamlined, so as to prevent excessive purchases and obviate accumulation of surplus stores.

X

ORGANISATION

A. Manpower Analysis

10.1. The strength as fixed by the Management, actual in position and the difference as on 31st March, 1973 is given below:—

Refineries	Designed capacity to process crude oil (in lakhs tonnes)	As per DPR	No. of Men: As fixed by the Management	No. of Men: In position (31-3-73)	No. of men in excess (5—4)
1	2	3	4	5	6
Gauhati	7·5	578	1,058	1,249	191
Barauni	30·0	1,361	2,083	2,793	710
Gujarat	30·0	1,086	1,332	1,430	98
					999

10.2. The approximate financial liability of the surplus men is of the order of Rs. 4.89 lakhs for Gauhati, Rs. 39.11 lakhs for Barauni and Rs. 6.24 lakhs for Gujarat per annum based on 1972-73 figures.

10.3. The Committee enquired about the justification for the existence of such an excess manpower in all the three refineries particularly in Barauni where the Atmospheric Unit III, Kerosene Treating Unit and Bitumen unit have idle capacities. In a written reply the Ministry stated as follows:—

> "The number of persons in position during 1972-73 in the three refineries has been in excess over the figures indicated in the DPR. It is, however, to be noted that the staff strength indicated in the DPR cannot always be taken as the final figure with regard to the staff strength. The refineries also faced problems such as absorption of workers engaged in the construction of the project, implementation of Arbitration Awards etc. It is also to be noted that in certain cases the under-utilisation of capacity of certain units may not necessarily mean reduction in the number of personnel required."

10.4. During evidence, the Managing Director explained the position as follows:—

> "Barauni Refinery was not completed immediately. Four Units were completed gradually and since construction was going on. Those people who were not considered as construction staff could not be retrenched and the matter was going on for a long time and there was a lot of labour unrest. Ultimately this matter was referred to arbitrator and the arbitrator had given his award. In his award, he said that 700 of these surplus construction people should be absorbed. That is why we have got to keep surplus people. They are mainly unskilled and semi-skilled people."

10.5. About the utilisation of extra staff the Managing Director stated as under:—

> "The labour situation is such that we cannot retrench them even though there is not much work for them. What we have done now is that in refineries like Gujarat & Barauni, we have utilised some of these people for our future plans.....We are trying to train them in some type of job such as loading LPG and petroleum products etc. We are training them. As far as possible we are utilising them for these purposes."

10.6. The Committee find that the number of men in position in the Gauhati, Barauni and Gujarat Refineries as on 31st March, 1973 were 116 per cent, 105 per cent and 31 per cent more than that indicated in the respective Detailed Project Reports of these Refineries. They also note that on 31st March, 1973 about a thousand persons were in excess of the strength fixed by the Management themselves for the three Refineries. The Committee are informed that the norms indicated in the DPR's were not applicable as many of the items were not taken into account at the time of drafting of the DPR's. The refineries were faced with the problem such as absorption of workers engaged in the construction of the project, implementation of arbitration awards etc. and even if the surplus staff is identified the retrenchment of such staff would pose serious problems.

10.7. In the opinion of the Committee, deployment of staff in excess of requirement only reduces the efficiency and increases the overheads. The Committee also feel that surplus construction staff should be gainfully employed in other projects under construction. The Committee recommend that the Government/Corporation should under-take a review of the staff strength in all the three refineries and identify the staff in excess of requirement, and make concerted efforts to absorb the surplus staff gainfully in other Central or State Projects that are coming up in the area.

B. Overtime Payment

10.8. The three refineries have been paying substantial amounts as overtime. The overtime paid during the last six years and its percentage to the total salaries and wages is indicated below:—

Refinery	Year	Crude oil processed (tonnes)	Salaries and wages (Rs. in lakhs)	Overtime paid (Rs. in lakhs)	Percentage of overtime to salaries and wages
1	2	3	4	5	6
Gauhati Refinery .	1967-68	8,11,719	49·08	4·22	8·60
	1968-69	82,650	50·11	4·41	8·80
	1969-70	7,64,795	68·33	8·49	12·42
	1970-71	6,85,750	89·07	8·47	9·51
	1971-72	7,96,029	94·73	11·89	12·55
	1972-73	7,93,135	97·73	13·14	13·45
Barauni Refinery .	1967-68	16,29,625	124·00	Not available	—
	1968-69	17,67,129	108·10	13·56	12·54
	1969-70	20,87,894	142·00	13·85	9·75
	1970-71	21,91,079	176·69	22·22	12·58
	1971-72	22,78,232	188·55	31·28	16·59
	1972-73	23,92,147	197·65	41·82	21·16
Gujarat Refinery .	1967-68	19,18,293	54·41	6·10	11·21
	1968-69	29,58,032	59·05	7·06	11·96
	1969-70	33,97,942	60·32	5·94	9·73
	1970-71	34,63,004	97.00	6·79	7·00
	1971-72	36,42,665	101·01	8·68	8·59
	1972-73	37,83,517	105·07	10·88	10·36
				218·80	

10.9. The Management stated in July, 1971 that ".....efforts are being made to control overtime to the minimum."

10.10. The Committee find that about Rs. 218.80 lakhs had been paid as overtime in the three Refineries during the years 1967-68 to

1972-73. The overtime bill has shown a gradual increase during these years. During the year 1972-73 the percentage of overtime to salaries and wages was 13.45; 21.16 and 10.36 in the case of Gauhati, Barauni and Gujarat Refineries respectively. The Committee are surprised that on the one hand the refineries are facing the problem of surplus staff, on the other hand overtime amounting to several lakhs of rupees is being paid to the employees. Although the Management stated in 1971 that efforts were being made to control the overtime to the minimum, yet the overtime bill goes on unabated.

10.11. The Committee need hardly stress that the overtime payments act as a disincentive to efficiency. They, therefore, recommend that Management should adopt strict measures so as to keep the overtime bill to the minimum and thereby reduce the expenses on overheads and economise in processing costs.

C. Internal Audit

10.12. Prior to 1st March, 1969 the Internal Audit Department was under Financial Controller and reports were put up to him and the Managing Directors only. In their meeting held on the 22nd February, 1968 the Board of Directors approved the reorganisation of the Internal Audit and decided that the Internal Audit Department should function directly under the Finance Director and not under Managing Directors. It was also desired that important points noticed in the internal audit should be circulated to the Board from time to time. The Internal Audit was accordingly reorganised from 1st March, 1969. The important points thrown up by the Internal Audit Department were, however, brought to the notice of the Board of Directors for the first time in the meeting held in August, 1971. In this connection the Ministry have stated as follows:—

> "After reorganisation of Internal Audit with effect from 1st March 1969 the main problem faced by Internal Audit was the non-availability of proper officers and staff for manning the Department and even the Chief Internal Audit Officer posted under Finance Director with effect from 1st March, 1969 could not effectively take over charge of the post as he was not relieved of his duties of the Financial Controller Pipeline which post he was holding prior to 1st March, 1969 and this position continued for more than a year."

10.13. The Committee on Public Undertakings in their Fifteenth Report (Fourth Lok Sabha—April, 1968) on Financial Management in public Undertakings recommended that the functions of the Internal Audit

should include a critical review of the system, procedures and operations as a whole. The Ministry of Finance (Bureau of Public Enterprises) while accepting the above recommendations directed the Public Enterprises in September, 1968 to introduce such a system. The Internal Audit Sections at Gauhati, Barauni and Gujarat refineries which were established in July, 1966, June, 1966 and May, 1966 respectively with a nucleus staff, however, did not conduct any appraisal of the systems and operations of the refineries on the above lines till March, 1972.

10.14. In March, 1972, the Ministry stated that the internal audit manual which was published in July, 1971 after approval by the Board of Directors *inter alia* provided for a critical review of the systems, procedures, operations, etc. The Committee enquired as to whether any such review had been made by the Internal Audit Department. The Management have stated as follows:—

> "After the reorganisation of Internal Audit with effect from 1st March, 1969 the main problem faced by Internal Audit was the non-availability of proper officers and staff for manning the Department. In spite of this a critical review of all production units and utilities was conducted in Barauni Refinery during 1971-72 and a report was rendered to General Manager (Barauni) on 27th August 1971. In respect of Gujarat, and Gauhati Refineries, during the year 1971-72 whenever an audit of a particular Department was conducted, a detailed study of the procedures and systems applicable to the Department concerned was done and points noticed during the Internal Audit were discussed at appropriate level in the Management.
>
> During 1972-73 a review of the system, procedure and operation as a whole of the Gauhati Refinery was done and an appraised report was rendered to General Manager and Managing Director. In Gujarat Refinery also a similar review was conducted in November, 1972 and interesting points were brought to the notice of the Management at appropriate level.
>
> In Barauni Refinery important critical study on (i) LPG production and (ii) utilisation of Coke Calcination plant was undertaken during the year 1972-73 and necessary report was rendered to Managing Director (Refineries).

10.15. The Committee note that the Internal Audit Department was reorganised in March, 1969 and the Board of Directors desired that important points noticed by it should be brought to their notice from time to time. The Internal Audit was also expected to conduct a critical review of systems, procedures and operations of the refineries as a whole. The Committee are surprised to note that it was only in August, 1971 that important

points were brought to the notice of the Boards of Directors for the first time. A Critical review of systems, procedures and operations of the Gauhati and Gujarat Refineries was conducted only in 1972-73. Critical review of production units and utilities in the Barauni Refinery was done during 1971-72 and that of LPG production and utilisation of Coke Calcination Plant was undertaken in 1972-73.

10.16. The Committee need hardly emphasise the importance of Internal Audit as one of the essential tools of management control. They, therefore, recommend that the Corporation should activise and strengthen the Internal Audit Cells in the refineries and make use of the reports of Internal Audit to set right the deficiencies, plug loopholes and cut out wastages in the various Units.

XI

CONCLUSION

The Refineries Division of the Indian Oil Corporation *i.e.* the erstwhile Indian Refineries Ltd. came into being in August, 1958, with 100 per cent equity capital from Government of India and vested with the responsibility of setting up two oil refineries in the Public Sector, one at Noonmati near Gauhati in Assam and other at Barauni in Bihar. The Gauhati Refinery with a processing capacity of 7,50,000 tonnes of crude oil per annum was commissioned on 26th December, 1961. The Barauni Refinery with a processing capacity of 2 million tonnes of crude oil per annum went into trial oprations in July, 1964. Its processing capacity was expanded to 3 million tonnes in January, 1969.

The third Refinery at Jawaharnagar in Gujarat with an initial capacity of two million tonnes per year was commissioned in June, 1966. The capacity was subsequently expanded to three million tonnes in September, 1967.

The construction of the Haldia Refinery with an annual processing capacity of 2.5 million tonnes was entrusted to the Corporation on 18th September, 1967. The fuel-sector of the Refinery is likely to be completed by the middle and the lube sector by the end of 1974.

A new Refinery with a capacity of 6 million tonnes per year is being set up at Mathura in U.P. and it is expected to be completed by 1978.

During the course of examination of the Refineries Division (excluding pipeline section) of the Indian Oil Corporation the Committee find that:—

(i) The three operating Refineries of the Indian Oil Corporation Ltd. have increased their capacity from 5.75 million tonnes per annum to about 8 million tonnes per annum. As against the original capacity of 0.75 million tonnes the operating capacity of the Gauhati Refinery is 0.80 million tonnes. Barauni Refinery has increased its capacity from 2 million tonnes to three million tonnes. The Gujarat Refinery which was designed for a capacity of 3 million tonnes per annum has increased to 4.3 million tonnes by bringing about operational changes and modifications.

(ii) About 40 per cent of the Gujarat Refinery's design drawing were prepared by India Engineers in collaboration with a small

team of seven Russians and the expansion of Gujarat and Barauni Refinery was done 100 per cent by the same organisation. The Gujarat Refinery utilised about 60 per cent of equipment and materials from indigenous sources and about 75 per cent for expansion to 3 million tonnes. The expansion of the Refinery to 7.3 million tonnes is being designed and built without foreign collaboration.

(iii) The processing cost in the Gujarat Refinery is the lowest as compared to all the other Refineries in India both in the public and private sector. This Refinery has also achieved a higher percentage of yield than envisaged in the Detailed Project Report by certain steps like economy in use of fuel, reduction of power, steam and water and effecting control by technical auditing, utilisation of more and more gas as fuel resulting in less flare of gas.

(iv) During the year 1972-73, the Gauhati, Barauni and Gujarat refineries made a profit of Rs. 72.78 lakhs, Rs. 277.98 lakhs and Rs. 643.31 lakhs respectively.

(v) A Central Service Organisation has been set up to give advice to the various units on all problems.

The Committee, however, find that (a) Government|Corporation have not been able to achieve the targets for the expansion/creation of the refining capacity as envisaged in the Fourth Five Year Plan document.

(b) the utilisation of the available capacity of Atmospheric Unit III was held up due to delay in settlement of the rate transportation of crude through Oil India Pipeline and later due to the decision of Government to set up a separate Refinery in Assam. Modifications will now have to be made in the Refinery for processing the imported crude at an estimated cost of Rs. 7.60 crores and a new pipeline would be required to be laid from Haldia to Rajbandh at a cost of Rs. 6 crores. The notional loss incurred by the Corporation as a result of keeping the Unit idle/underutilised has been stated to be Rs. 6 crores per annum in terms of foreign exchange and Rs. 17 lakhs on account of interest and depreciation charges. The under-utilisation of the Atmospheric Unit III has also affected the working of the Kerosene Treating Unit and consequential loss is stated to be of the order of Rs. 15 lakhs during the period 1969-70 to 1972-73.

(c) The financial implications and economics of setting up a new refinery in Assam keeping the third installed Unit of the Barauni Refinery idle/under-utilised had not been worked out.

(d) The setting up of the new refinery in Assam has also been considerably delayed due delay in coming to a final decision by Government;

(e) The construction of the Haldia Refinery has been delayed by about 4 years.

(f) The setting up of the Haldia Refinery was taken up in September, 1967 without a Project Report. Government approved the Project cost estimate of Rs. 67.50 crores only in July, 1972.

Gauhati Refinery—Performance

(g) The utilisation of the Crude Distillation Unit of the Gauhati Refinery was only about 97 per cent, 86 per cent, 99.7 per cent and 99 per cent of the in-built capacity of 8,10,000 metric tonnes during the years 1969-70, 1970-71, 1971-72 and 1972-73 respectively.

(h) The utilisation of capacity of the Kerosene Refining Unit of the Refinery was only about 13 per cent, 19 per cent, 30 per cent, 27 per cent and 53 per cent during the years 1968-69, 1969-70, 1970-71, 1971-72 and 1972-73 respectively.

(i) Coking Unit could not be fully utilised for want of the required quantity of the feed stock.

(j) The LPG Project which was initiated in June, 1964 was completed after about 9½ years.

(k) The Refinery incurred a loss of more than a crore of rupees in the flaring of gas which would have otherwise been used as fuel.

BARAUNI REFINERY—PERFORMANCE

(l) Although the Barauni Refinery was with two million tonnes capacity commissioned in July, 1964, the complete cost of the project has not yet been approved by Government. An amount of Rs. 46.63 crores has already been spent on the Project.

(m) Installed capacity in the Barauni Refinery could not be fully utilised during 1969-70 to 1972-73 due to limited crude availability from Assam fields. In 1972-73 through put was slightly more.

(n) The Kerosene Treating Unit II which was set up in the Barauni Refinery at a cost of Rs. 1.24 crores in December, 1965 was practically idle since its commissioning except for 93 days in 1968-69 and 80 days in 1969-70 when Kerosene Treating Unit—I was shut down. It has now been decided to utilise this unit in the Bongaigaon Refinery which is expected to be commissioned by 1976 and the cost of dismantling and installing the Unit would be Rs. 25 lakhs.

(o) Though the Lube Oil Complex of the Barauni Refinery was originally disigned to produce four lube stocks, it was not possible to produce all the 4 grades of oil because of defects in the crude vacuum unit due to

defective design. Consequently the plant remained under-utilised from 1967-68 to 1969-70.

(p) Compounding facilities for base stock of lubricating oil and additives created at a cost of Rs. 29 lakhs remained under-utilised as only one grade of oil was being produced which did not require blending.

(q) The Bitumen Unit of the Barauni Refinery set up in November, 1966 at a capital cost of Rs. 1 crore, without proper investigation remained idle/under-utilised since its inception. Even after carrying out modifications in 1968 at about a cost of Rs. 4 lakhs the unit could not be started as it could not produce bitumen suitable for road work in plains. The restricted/non-operation of the Unit resulted in the loss of Rs. 1 crore. Modifications proposed for this Unit are expected to Cost Rs. 40 lakhs.

(r) Due to delay in the commissioning of the Coke calcination Plant, Raw Petroleum Coke had to be sold at a distress price of Rs. 80 per metric tonne.

(s) Although there is gradual increase in the production of LPG in the Barauni Refinery from 239 tonnes in 1965-66 to 14,729 tonnes in 1972-73, it is much short of the production envisaged in the Detailed Project Report.

The Committee appreciate that the Refineries Division of the Indian Oil Corporation have been able to help the country in its goal of achieving self-sufficiency in petroleum products. They hope that with the implementation of the programme of further expansion of the refining capacity according to schedules IOC will be able to strengthen the national economy.

SUBHADRA JOSHI,
Chairman
Committee on Public Undertakings

NEW DELHI;
April 26, 1974

APPENDIX

Summary of Conclusions|Recommendations of the Committee on Public Undertakings contained in the Report

S. No.	*Reference to Para No. in the Report*	*Summary of Conclusions|Recommendations.*
1	2	3
1	2.17 to 2.23	The Committee note that the Atmospheric Unit III at Barauni was approved by Government on the basis of an assurance given by ONGC that additional crude would be available from Rudrasagar and Lakwa oil fields and the presumption that it would be transported through the Oil India Ltd. pipline from Barauni to Moran by upgrading its capacity and by expanding the crude oil conditioning plant at Moran. Although the Unit was commissioned in January, 1969, it had to remain idle|underutilised for want of indigenous crude as no reasonable agreement could be reached between the ONGC and the Oil India Ltd. regarding the tariff for transportation of ONGC crude through the crude oil pipeline of Oil India Ltd. Only an interim agreement between ONGC and Oil India Ltd. could be reached in March, 1971 after protracted negotiations lasting for more than 4 years. When the negotiations were still going on, the Government decided in December, 1969 to set up a new refinery in Assam to process the Assam crude and to permit the Barauni Refinery to secure crude for its third unit from other sources including import. As a result, the utilisation of the available capacity was held up and modifications will have to be made in the refinery for processing imported crude at an estimated cost of Rs. 7.7 crores and a new pipeline would be required to be laid from Haldia to Rajbandh at a cost

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of Rs. 6 crores. Meanwhile, processing of the imported crude in the unit had been started from December, 1972 and it could process 5 to 7 lakh tonnes per annum after minor modifications. From December, 1972 to 31st March, 1973, 1.3 lakh tonnes of imported crude had been processed in this unit.

The Committee regret to note that because of the delay in arriving at a decision about the tariff for transportation of crude through the Oil India Pipeline, the Atmospheric Unit III which was commissioned as early as January, 1969 had to be kept idle or under-utilised, resulting in a national loss of the order of Rs. 6 crores per annum in terms of foreign exchange and Rs. 17 lakhs per annum on account of interest and depreciation charges alone. The loss would be more if the cost on account of personnel is also added. The under-utilisation of the Unit had also affected the working of the Kerosene Treating Unit and the consequential revenue loss is stated to be of the order of Rs. 15 lakhs during the period 1969-70 to 1972-73. The Committee were informed that as the quantum of imported Crude increases, the Kerosene Treating Unit I which is at present in operation would become progressively under utilised.

The Committee were informed that as a result of the change over from indigenous to imported crude, there would be a recurring loss of Rs. 85 lakhs per annum on the assumption that the Corporation would be able to get LR-I tankers for transportation of imported crude and in case the existing arrangements for transporting imported crude continue, the Corporation would be losing another Rs. 540 lakhs per annum. The whole economics of utilisation of imported crude is stated to have been worked out taking the price of imported crude at US 2.38 dollars per barrel. The Committee need hardly point out that these economics are bound to be adversely affected because of the latest price spiral of the imported crude.

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		The Committee also regret to note that decision once taken about the expansion of the Barauni Refinery based on utilisation of indigenous crude from Assam was altered in favour of setting up of a new refinery in Assam and the decision taken to process crude from other sources including imported crude in the Barauni Refinery. The Committee fail to understand as to why the financial implications and economics of setting up a new refinery in Assam keeping the third installed unit of Barauni idle/under-utilised had not been worked out before the decision to set up a new refinery in Assam was taken. It was admitted during evidence that the Barauni Unit could have been planned on a more diverse quality and wide range of crude than was done. The Committee feel that had this been done, the Corporation would not have been faced with such a situation as indicated above. The Committee take a serious view of the huge loss suffered by the Government/Corporation as a result of taking up the expansion of the Barauni Refinery first on the basis of indigenous crude and later switching over to imported crude. The Committee recommend that the entire matter should be throughly investigated by a high level Committee so that the shortcomings/lapses at different stages are pin-pointed to obviate such costly lapses in future.
2	2.32	The Committee find that though the Expert Committee constituted by Government to study and report on the techno-economic feasibility of locating the additional refining capacity in Assam had recommended in September, 1969 that it was not necessary to create additional refining capacity of the conventional type for processing the crude oil estimated to be available from Assam and that the processing of imported crude at Barauni would involve considerable cost, Government, in December, 1969 announced their decision to increase the refining capaity in

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		Assam by one million tonnes either by building a new refinery or by expanding the existing refinery at Gauhati and to permit the Barauni Refinery to secure crude for its third unit from other sources including import. In October, 1970, Government decided to set up a one million tonnes refinery at Bongaigaon with a petro-chemical complex and the investment decision thereon was taken in March, 1972. The Committee are constrained to observe that the delay in coming to a final decision on the implementation of the Government's decision regarding the setting up of the additional capacity in Assam had resulted not only in non-utilisation of the capacity available in the Barauni Refinery and the processing of the available indigenous crude in Assam but also delayed the creation of additional refining capacity in the Public Sector. The Committee recommend that these aspects of delays should also be examined by the high level Committee suggested earlier for atmospheric Unit III of the Barauni Refinery so as to eliminate them in future.
3	3.11 to 3.14	The Committee find that one of the considerations for locating the Refinery at Haldia was the easier availability of land at low cost. The Committee were, however, informed that even when the decision to set up the Refinery was taken, land had already been acquired by the Calcutta Port Commissioner and the Corporation was faced with a *fait-accompli* to take over this land on a lease rent of Rs. 3.60 lakhs per year. The undertaking would thus be saddled by a recurring liability. The Committee regret to note that although 335 acres of land was taken as early as 1969, no agreement stipulating terms and conditions of lease has so far been finalised. The Committee recommend that the Government/Corporation should take up the matter at the appropriate level with a view to finalise the agreement without further delay. The Committee understand that one other consideration for locating the Refinery at Haldia was the

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		easier availability of fresh water from the tube wells. The Committee find that this benefit has also not been actually realised. The Site Selection Committee had assumed that each tubewell would yield one million gallon of fresh water per day, and this assumption was stated to be based on the assessment made by the Ground Water Division of the Geological Survey of India. The Committee are surprised to note that Geological Survey of India had, however, indicated in 1969 that half of the area in which the Refinery was to be located would hardly have any suitable acquifer for yielding water while the remaining half might yield 0.5 million gallon per day per tube well sunk in that area. The Committee recommend that the matter regarding conflicting assessments made by the Geological Survey of India may be investigated in order to fix responsibility and avoid recurrence of such wrong assumptions in the framing of project details.
4	3.24 to 3.26	The Committee take a serious view of the fact that Government proceeded with the setting up of the Haldia Refinery without preparation of a Project Report and without a precise idea as to what the project would ultimately cost. The Committee fail to understand as to how Government could assume that the cost of Haldia Refinery would only vary to the extent of 5 per cent from the cost of Madras Refinery when the two projects were based on different collaboration and situated in different locatinos. The Committee find that Government authorised the Company (in 1969) to sanction individual works within an overall limit of Rs. 46 crores. It was only in January, 1970 the Corporation prepared detailed estimates of cost for Rs. 71.44 crores. These estimates were, however, revised to Rs. 67.51 crores, and sent to Government in September, 1970. The Committee find that Government approved the Project Cost estimates of Rs. 67.50 crores only in July, 1972 *i.e.*, after a lapse of about two years. The

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		Committee strongly deplore the delay in processing in the revised estimates and according sanction. The Committee also view with concern that the Corporation was allowed to proceed with the work and incur expenditure thereon without the financial commitments having been properly sanctioned and approved. The Committee fail to understand as to how in the absence of a detailed estimate of cost, effective control and check of expenditure on the projet could be exercised. The Committee were informed that even now the revised estimates as approved by Government are not final and the project cost would go up due to delay in the commissioning of the Refinery, and the extent of revision would be worked out only after the completion of the project. The Committee need hardly stress that revised estimates of the project should not be treated as a mere completion report but should serve as an instrument of financial control. The Committee, therefore, recommend that the Corporation/Government should finalise the revised estimate of the project without any further delay. The Committee stress that the implications of the increased capital investment on the economics of the Project should be critically gone into and brought to the notice of Parliament as recommended by the Committee in paragraph 2.20 of their Thirty-Ninth Report (Fifth Lok Sabha).
5	3.38 3.40	The Committee find that as per the original time schedule proposed in August, 1967 the main Refinery was expected to be completed by the second half of 1970 and the Lube Oil Units by early 1971. The construction schedules have been revised several times. It is now expected that the fuel part of the Refinery would be completed by the middle of 1974 and the lube part of it by the end of 1974. The Committee regret to note that the construction of the Haldia Refinery has been delayed by about 4 years.

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		The Committee would like Government to thoroughly investigate the matter so as to identify the factors which continue to impede the completion of the Project so that the latest estimates for commissioning of the Refinery are adhered to.
		The Committee need hardly stress that any further delay in the construction and commissioning of the Refinery would only accentuate the oil crisis in the country.
6	4.12	The Committee note that the Fourth Five Year Plan envisaged an increase in the Refining capacity in the public sector from 8.25 million tonnes to 17.55 million tonnes per annum. They, however, find that for one reason or other none of the schemes envisaged in the Fourth Five Year Plan could be fully implemented, with the result that the refining capacity likely to be available by the end of the Fourth Plan would be only 18.25 million tonnes per annum. The Committee have already recommended elsewhere in this Report that the delays in commissioning of the Haldia and Bongaigaon Refineries and the under-utilisation of Barauni Refinery should be investigated by Government. The Committee hope that Government Corporation would profit from their past experience and have an integrated approach in drawing up schemes for expansion of refining capacity in the Fifth Five Year Plan keeping in view the availability of indigenous and imported crude.
7	4.24 to 4.26	The Committee find that the private sector refineries have increased their capacity from 8.25 million tonnes per annum to 10.30 million tonnes per annum. The Committee were informed that this increased capacity is being utilised for getting the crude oil supplied by ICO processed and the products taken over by IOC for marketing. It has been admitted that had the Haldia Refinery been ready as scheduled and the Koyali Refinery had its pipeline, the Indian Oil Corporation would not have gone to the private sector companies for refining their crude.

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		The Estimates Committee (1967-68) in their Fiftieth Report on 'Petroleum and Petroleum Products' had earlier expressed their doubt whether the capacity of these private sector refineries could be increased with minor modifications and improvements unless the additional capacity was contemplated and built into the original plant and equipment itself. They recommended that Government should immediately evolve a suitable machinery to ensure that no industrial unit was able to increase its licensed capacity in that manner without prior approval of the Government. The Committee regret to note that in spite of this recommendation of the Estimates Committee and inspite of Government's own categorical assurance, the Government have not investigated into the matter. They are surprised to find that refineries have created a further capacity of more than 25 per cent and are operating at levels higher than those licenced for. The Committee recommend that the Government should make a detailed and thorough investigation without any further delay.
		The Committee note that Government claim that they have been able to increase the refining capacity of the existing refineries by debottlenecking, changing operating conditions etc. in the Koyali, Cochin and Madras Refineries. The Committee, however, find that the percentage of increase achieved in those refineries is much less compared to the increase in the capacity achieved by the private refineries. The Committee recommend that Government Corporation should give the highest priority to this aspect of increasing the refining capacities in the public sector refineries by revamping and debottlenecking etc. so as to achieve maximum results.
8	5.11	The Committee are surprised to note that though the area of 480.22 acres had been acquired by State Government of Assam and handed over to the Refinery during December, 1959 and February, 1964, the deed of conveyance for land has not been executed so far. Earlier in November, 1959, it was decided that the State Government of Assam would be

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		allowed to have financial participation in the Refinery to the extent of the actual expenditure on the acquisition of land. In July, 1962, it was decided that the financial participation should be limited to 15 per cent of the equity capital investment in the refinery and the first issue of shares should be adjusted towards the cost of land and balance subscribed in cash. However, in July, 1969 Government, took the decision that the Central Ministries should desist from approaching the State Government for provision of land and services free of cost or at concessional rates for Central Projects. The Committee regret to note that there has been in inordinate delay to over 14 years even in clinching the issues for settlement and even now the State Government have not paid the cost of development of land. The Committee recommend that Government should take more serious measures and settle the issues with the State Government without any further delay.
9	5.18 to 5.19	The Committee note that though according to agreement with foreign collaborators, the Refinery was to be commissioned by October, 1961, there had been delays ranging from two to six months in the actual completion of various units resulting in overstay of the foreign technicians. Consequently, there had been an increase in the cost of technical assistance from Rs. 28.57 lakhs to Rs. 39.21 lakhs. The Committee regret to note that there had been a delay of over ten months in preferring the claim for reimbursement of extra expenses and the first claim to the tune of Rs. 7 lakhs was preferred only in February, 1963. The Committee were informed that even after protracted correspondence and discussions, an agreement was reached with the collaborators only in August, 1964. The Committee find that after this agreement the Corporation had taken further period of two years to revise their claim and prefer it.

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		The Committee view with concern the inordinate delay on the part of the Management both in preferring the claim and subsequently revising it. Even after a lapse of seven years, the claim is stated to be pending decision and settlement. The Committee recommend that the reasons for this inordinate delay at several stages should be investigated and responsibility fixed. The Committee would like that the question of settlement of the revised claim should be vigorously pursued so as not to lose more time.
10.	5.31	The Committee note that lower supply of crude oil unsteady and interrupted power supply from the Assam State Electricity Board, delay in the overhaul of the Refinery's generators, product upliftment difficulty at Siliguri and shut downs of Coking Unit causing ullage problem for reduced crude and shut down of product pipeline have been the main reasons for the shortfall in the utilisation of capacity of the Crude Distillation Unit. The Committee recommend that Government Corporation should analyse these causes in detail in order to find out as to what extent these problems were avoidable in nature. The Committee have no doubt that had there been a proper scheduling for overhaul and advance planning many of the difficulties could have been avoided and shut downs of the Coking Unit and product pipeline could have been reduced to the minimum. The Committee find that the crude throughput including slops and capacity utilisation were the highest during 1967-68. The Committee hope that in the light of the past experience, Government/Corporation would take appropriate steps to secure an uninterrupted supply of power either through the ASEB or by suitable alternate arrangements. The Committee need hardly stress that in view of the tight position of imported crude, Government should take concerted measures to sustain this high throughput and ensure maximum utilisation of the Gauhati Refinery which is processing indigenous crude.

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11	5.48 to 5.51	The Committee find that the utilisation of capacity of the Kerosene Refining Unit was only 18.90 per cent, 31.84 per cent, 12.61 per cent, 19.33 per cent, 30.2 per cent, 27.2 per cent, and 53.3 per cent of the designed capacity during the years 1966-67, 1967-68, 1968-69, 1969-70 and 1970-71, 1971-72 and 1972-73 respectively. The shortfall in the utilisation of capacity was stated to be due to substantial change in the quality of crude resulting in lower percentage of kerosene production than that assumed at the time of designing the plant. Moreover coke kerosene from the Coking Unit could not be spared for processing in this Unit as the same was required to be blended into diesel oil and fuel oil. The Committee also note that the Unit could not be run continuously on account of problems of corrosion and low inventory of Sulpher dioxide. The Committee are unable to appreciate as to why it is not possible for the Corporation to locate the sources of supply of Sulpher dioxide in time and take action well in advance to arrange for the supply of Sulpher dioxide. The Committee were also informed that the inferior kerosene had a market and it could be produced without using the Kerosene Treating Unit. During the earlier years also there was the problem of finding a market for iomex. From the foregoing, the Committee are led to the conclusion that the Kerosene Refining Unit was set up without assessing the quality and quantity of inputs that would be available for processing in this Unit and without carrying out a detailed market survey for its product yield. The Committee regret to note that variation in the product yield compared to the yield envisaged in the Technical Project Report resulted in the loss of revenue to the extent of Rs. 35.57 lakhs during the years 1966-67 to 1972-73. The Committee recommend that Government should enquire into the circumstances leading to the setting up of this Unit without proper planning and a detailed market survey. The Committee hope

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		that at least now, in the light of the past experience, the Management would take advance action to ensure the availability of adequate quantity of Sulpher dioxide required for the operation of the Unit and avoid recurrence of problems like corrosion etc. so as to ensure continuity in operating the Unit and achieving maximum output of the installed capacity.
12	5.61	The Committee find that the percentage of "gas" and "loss" together was more than that envisaged in the project design. The change in the product pattern from the original design has already resulted in a loss of Rs. 27.2 lakhs during the year 1966-67 to 1972-73 and there would also be a recurring loss of Rs. 10 lakhs per annum. The Committee recommend that the operation of the Unit should be so regulated that the production of gas is reduced to the minimum. They also recommend that Government Corporation should consider seriously the feasibility of converting the gas as fuel for domestic consumption and avoid a recurring loss thereon.
13	5.76 to 5.80	The Committee find that an agreement was entered into with M/so. India Carbon Ltd. (ICL) in June, 1961 for the sale of Raw Petroleum Coke (RPC) ex-Gauhati. The agreement did not contain any penalty clause in order to protect the interest of the Corporation in the case of non-movement of RPC by ICL. On several occasion the firm failed to clear the stock of coke in time with the result that large quantities of coke remained with the Refinery. The Committee further note that as per agreement, the Corporation was to make "RPC available at the Refinery Cokeyard and the party was to uplift the product from the Cokeyard at their expense." The Refinery's railway track, was, however, linked up with the track leading from the Refinery Cokeyard to ICL's plant to enable ICL to load wagons and haul the product to their factory. M|s. India Carbon Ltd. made use of the track but no recovery was made from the firm for using the track. The amount not recovered for the period upto March, 1970 was Rs. 2.50 lakhs.

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The Committee are surprised to note that even while renewing the agreement in 1969 no provision was made for the recovery of railway siding charges and M|s. India Carbon Ltd. continued to enjoy the facility free of cost. According to the Management the existing under-recoveries to the extent of 50 paise per metric tonne continued to be incurred The Committee are further informed that it was not possible to work out the manufacturing cost of raw petroleum coke. The pricing was based on the economics of 'law of supply and demand'. Government had also not fixed any price for the raw petroleum coke as had been done in the case of bulk refined petroleum products. Thus the Corporation was free to negotiate the price from time to time on an *ad hoc* basis. The Committee are surprised to find that the price of coke was not even linked up with the price of crude. There was no clause in the agreement with H|s. Indian Carbon Ltd. for the sale of coke ex-Gauhati to provide for the increase in the price of this commodity during the pendency of the agreement.

Although the price of coke-ex-Barauni has been fixed at Rs. 260 per metric tonne, the sale of coke-ex-Gauhati continued to be at the rate of Rs. 165 per metric tonne upto December, 1973 as per the agreement signed in 1969. National price differential on quantities sold to ICL ex-Cauhati has been calculated at Rs. 30 lakhs;*

The Committee view with concern the manner in which the agreement for the sale of raw petroleum coke from Gauhati Refinery was finalised with M|s. India Carbon Ltd. They therefore, recommend that the whole matter regarding the sale of coke to

*At the time of factual verification the Indian Oil Corporation have stated as follows:—
"The Corporation has since conducted negotiations with M/s. India Carbon Ltd. and they have agreed to pay revised price of Rs. 845 per M.T. with effect from 1.1.74 to match the enhanced crude price of US $ 8.48 BBL. This price is also applicable to coke being sold from Barauni and the price is subject to revision on the basis of crude price. The firm has agreed to the revised price in spite of a fixed price agreement up to June, 1974. This will bring to the Corporation on additional revenue of over a crore of rupees."

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		M/s. India Carbon Ltd., ex-Gauhati should be thoroughly investigated in order to fix responsibility for the huge loss suffered by the Corporation. The Committee further recommend that the price of coke should be realistically fixed by Corporation keeping in view the current increase in crude price and also the latest demand pattern.
14	5.91 to 5.94	The Committee note the wide variations in the consumption of utilities from year to year. One of the reasons is stated to be that utilities for production have not been separated from those for maintenance. The Committee are surprised to find that though the Refinery went on stream in December, 1961, the Management had not installed to ascertain and keep a check over the actual consumption of utilities in the different units. The Committee fail to understand as to why this important aspect was overlooked all along. The Committee stress that the process of installation of meters in the Refineries should be expedited. Norms for various processes had also not been fixed. The Committee need hardly emphasise that without an accurate system of recording the consumption of utilities, it is not possible to make use of the system of costing as an instrument of control and also work out the processing cost on a realistic basis. The Committee also urge that the technical auditing should be intensified so that there should be an effective control on consumption of utilities. The Committee urge that there should be a proper assessment of the consumption of utilities on production and maintenance and determination of costs on a scientific and accurate basis.
15	5.116 to 5.121	The Committee strongly deprecate the inordinate delay in the setting up of the project for the manufacture of Liquified Petroleum Gas (LPG) in the Gauhati Refinery. The Project which was initiated in June, 1964 was completed only now *i.e.* after about 9½ years. It took 2½ years for the Government to take a decision that LPG project need not be entrusted to the Rumanians but could be done

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by IOC. It took another year to decide that the work should be done departmentally instead of giving it to contractors. Order for the supply of vessels was placed with M|s. Triveni Structurals in June, 1968 after another six months, the scheduled date of delivery being 30th September, 1969. M|s. Triveni Structurals could not adhere to the schedule and the contract with them had to be cancelled in December, 1970.

M|s. Triveni Structurals conceded that they could not adhere to the scheduled dates of delivery but for further delay they laid the blame on the IOC who according to them could not arrange the inspection and testing of the storage vessels. IOC on the other hand blamed M|s. Triveni Structurals for having unilaterally changed the inspection authority without even informing them, thus violating the terms of the contract. Conflicting statements had been made by M|s. Triveni Structurals Ltd. and the IOC regarding the events leading to the cancellation of the contract.

The Committee regret to note the delay in the supply of vessels resulted in a loss not only to the Triveni Structurals Limited but to the refinery as during this period the Refinery gases were being flared without converting into LPG. The LPG had to be brought from Barauni Refinery and marketed in Assam area till the production of LPG at Gauhati Refinery started. Even after the cancellation of contract with M|s. Triveni Structurals it took almost 3 years for the completion of the project.

The Committee are concerned to note that the Government|Corporation have not found it necessary to calculate the loss suffered by the Refinery as a result of delay in the commencement of production of LPG.

The Committee recommend that Government should analyse the causes for delay in the setting up of the Project with a view to fixing responsibility and in order to ensure that such lapses are avoided in future.

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		The Committee need hardly stress that the market for LPG should now be developed in the area and the Management should step up production in order to meet the entire demand for the area.
16	5.127 5.128	The Committee regret to note that the Refinery incurred a loss of more than a crore of rupees in the flaring of gas which could have otherwise been used as fuel. It is quite surprising that during the past 12 years, no market had been found for the coking fuel oil which was being used as fuel instead of gas in the Refinery. The Committee would like to know as to why the economic feasibility of setting up a thermal power station utilising the coking fuel oil was not examined by Government earlier. They hope that with the setting up of the Chandrapur Thermal Power Station, the loss in the Refinery would be reduced to the minimum.
17	5.138 5.139	The Committee regret to note that the Gauhati Refinery had to incure a loss of Rs. 33.28 lakhs during the years 1966-67 to 1972-73 on account of movement, spillage leakage dipping errors in the course of loading from the tanks to tank wagons and tank lorries. There has been inordinate delay in the establishment of facilities for reducing this recurring loss. The Committee recommend that the Government should analyse the causes for delay at various stages and at various levels with a view to fix responsibility. The Committee would like to be informed as to what extent it has been possible to reduce the loss as a result of establishment of the facilities.
18	6.10 to 6.12	The Committee take a serious note of the fact that although the Barauni Refinery with two million tonnes capacity was commission for trial runs in July, 1964, the complete cost of the project has not yet been approved by the Government. Sanctions given upto June, 1962 to the extent of Rs. 32 ~~46~~ crores have been accorded by Government to some of the constituents of the Project. Thereafter the estimates have been revised by the Corporation several times and the Corporation continued with

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		the work on the Project in anticipation of Government's approval to the revised estimates. An amount of Rs. 46.63 crores has already been spent on the Project. The Committee are also informed that no feasibility report was prepared. It has been admitted by the Additional Secretary of the Ministry that the correct procedure was not followed. The Committee have been repeatedly emphasising in their *Reports that it is not correct to go ahead with the execution of a project without proper scrutiny of the feasibility Report therefor and an appropriate sanction of the project estimate. The Committee need hardly stress that the revised estimates of the Project should not merely be a completion report of the Project but should serve as an instrument of financial control. They, therefore, reiterate that the total commitments on a project should be prepared as realistically as possible in the beginning and should be available to Government and Parliament before a Project is approved. The Committee highly deplore the delay on the part of the Government/Corporation in finalising the estimates. They would like that the responsibility for the delay should be fixed. The Committee recommend that the revised estimates should be finalised with any further delay. The Committee also reiterate that the implications of the decreased capital investment on the economics of the Project should be critically gone into and brought to the notice of Parliament as recommended by the Committee in paragraph 2.20 of their Thirty-Ninth Report (Fifth Lok Sabha).
19	6.19	The Committee have elsewhere in this Report dealt in detail the question of under-utilisation of the refining capacity at the Barauni Refinery. They would like to stress that all out efforts should be made to fully utilise the available capacity in the Public Sector Refinering and the question of further expansion should be considered only after realisti-

× Please see Eighteenth and Thirty-Ninth Reports of the Committee on Public Undertakings (Fifth Lok Sabha)

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		cally assessing the availability of indigenous and imported crude and after a firm commitment therefor is made.
20	6.31 to 6.33	The Committee regret to note that the Kerosene Treating Unit II which was set up at a cost of Rs. 1.24 crores in December, 1965 was practically idle since its commissioning except for 93 days in 1968-69 and 80 days in 1969-70 when kerosene Treating Unit I was shut down. Government, however, expected that this could be utilised when Atmospheric Unit III went on stream. Even after Atmospheric Unit III started processing imported crude, Kerosene Treating Unit II could not be operated as the kerosene obtained from the Middle East did not require sulphur dioxide extraction. It has now been decided to utilise Kerosene Treating Unit II in the Bongaigaon Refinery which is expected to be commissioned by 1976 and the cost of dismantling and installing the unit at Bongaigaon Refinery would be Rs. 25 lakhs. The Committee feel perturbed that the Kerosene Treating Unit II was set up at a cost of Rs. 1.24 crores without proper planning and without a proper assessment of the feed stock that would be available for processing thus resulting in unnecessary locking up of capital for almost 11 years till the Bangaigaon refinery would be commissioned. The Committee recommend that this matter should be thoroughly investigated with a view to fixing responsibility for the huge loss suffered by the Refinery. The Committee also find that though the Kerosene Treating Unit I was stated to have an in-built capacity over and above its designed capacity its utilisation was only of the order of 68.7 per cent and 75.6 per cent during 1966-67 and 1968-69 respectively. The utilisation during 1969-70 to 1972-73, however, ranged from 106 per cent to 132 per cent. The utilisation in 1970-71 was as high as 132 per cent. The Committee desire that the actual in-built capacity of the Unit should be properly assessed so as to enable the Refinery to utilise it to the maximum and to correctly evaluate the performance.

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21	6.46 to 6.48	The Committee find that after commissioning of the Coking Unit of the Barauni Refinery in October, 1964 it was discovered that it was not possible to produce furnace oil of the specifications laid down in the Detailed Project Report as a result of which major modifications had to be carried out in November-December, 1966 at a cost of Rs. 44.23 lakhs. Even after the modifications, there has been considerable shortfall in the actual yield as against the product yield envisaged in the Detailed Project Report. The loss due to shortfall amounted to Rs. 28 lakhs during 1966-67 to 1969-70. The Unit had to be operated at lower severity in order to restrict the production of gas so as to ensure higher consumption of reduced crude as fuel which otherwise posed a disposal problem. Even the reduced quantity of gas produced could not be utilised as fuel resulting in considerable loss to the Refinery. The Committee would like Corporation to make duced crude should have been developed in time so as to synchronise with production and thereby the huge loss to the Refinery avoided. The Committee would like Corporation to make sure that gas and other by products arising in this Plant were put to maximum productive use and that the gas flared was absolutely in avoidable.
22	6.59 to 6.61	The Committee note that, though the Lube oil Complex of the Barauni Refinery was originally designed to produce four Lube base stocks, it was not possible to produce all the 4 grades of oil because of defects in the crude vacuum unit due to defective design and certain additions are required in the plant. Consequently, the plant remained under-utilised from 1967-68 to 1969-70 resulting in a loss of about Rs. 50 lakhs during this period. The Committee were informed that rectification of defects was not carried out as it involved a huge amount of money and a long period of shut down. What is more surprising is the fact that the Corporation discovered later that the 4 grades of oils planned to be produced were low grade

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		oils and could not meet the specifications of the products which were in demand in the market. It was also found that Digboi Refinery had increased the production of oils which could meet the market demand. As a measure of diversification, the Corporation took up production of 800 pale lube oil in March, 1969. Since 1970-71, the lube complex has achieved production more than the designed capacity. The Committee also regret to note that the compounding facilities for base stock of lubricating oil and additives created at a cost of Rs. 29 lakhs remained under-utilised as only one grade of oil was being produced which did not require blending. It has been stated that the equipments worth Rs. 19 lakhs are being utilised for handling phenol extract, slack wax and rubber processing oil. The Committee take a serious view of this huge loss due to under-utilisation of the Plant and the non-utilisation of facilities which in their opinion could have been avoided if the Complex had been created after a detailed market survey of the demand for products and proper planning. The Committee recommend that the matter should be thoroughly investigated in order to fix responsibility for this serious lapse, and to devise suitable measures to ensure that such costly lapses do not recur.
23	6.83 to 6.87	The Committee regret to note that the Bitumen Unit of the Barauni Refinery was set up in November, 1966 at capital cost of Rs. 1 crore, without proper investigation whether bitumen suitable for plains could be produced from Naharkatiya feed stock. Neither the Indian Standards Institute nor the Central Road Research Institute were consulted in the matter. The Committee are surprised that the ISI specifications already available for producing bitumen with Middle East crude were blindly adopted as a guide for producing bitumen from Assam crude. The result was that the unit remained idle/under-utilised since its inception. Even after carrying out modifications

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in 1968 at a cost of about Rs. 4 lakhs, the Unit could not be started as it could not produce bitumen suitable for road work in plains. Efforts to produce bitumen of grades other than those envisaged in the Project Report could also not succeed as production of bitumen of these grades proved to be uneconomical. The restricted non-operation of the Unit resulted in a loss of about Rs. 1 crore. The economics of producing bitumen in the Barauni Refinery also indicated that so long as there is spare capacity in the Coking Unit, the manufacture of bitumen would always be a losing proposition. The operation of the Unit even at its rated capacity would result in a net loss of Rs. 30 lakhs per annum. The Committee take a serious view of the defective planning in the setting up of this Unit.

The Committee also find that the Corporation imported 3000 tonnes of drum sheets and purchased 1026 tonnes of indigenous sheets for the fabrication of drums for bitumen. The Committee regret to observe that as the production of bitumen did not come up as anticipated, the fabrication of drums had to be kept in abeyance and 1900 tonnes of imported sheets had to be disposed of after about one year from the date of its purchase at a loss of Rs. 2.71 lakhs. The Corporation had also to incur a further loss of Rs. 7.12 lakhs upto 31st December, 1971 by way of interest charges and godown charges.

The Committee are informed that it is now proposed to restart the Unit using residues from imported crude after carrying out modifications at a cost of Rs. 40 lakhs which are likely to be completed by 1975. The Committee are surprised that modification would result in reduction of the existing capacity, though it is claimed that the margin of profit would be Rs. 2.33 lakhs. The Committee are not sure whether these economics of the Project would be realised particularly in the context of increase in the price of imported crude. The Committee would like Government to closely examine the economics of the proposed conversion to ensure that it is in the

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		best interest of the Corporation and larger public interest before investing any further amounts. The Committee recommend that the entire matter regarding the setting up of Bitumen Unit at Barauni Refinery should be investigated by a high level Committee in order to pinpoint the lapses and fix responsibility for the huge loss suffered by the Corporation. The Committee would like to be informed of the concrete measures taken to obviate recurrence of such costly lapses in investment and tying up of collaboration arrangements.
24	6.94 to 6.95	The Committee find that M/s. Engineers India Ltd. were entrusted with the task of design engineering, erection and commissioning of the Coke Calcination Plant at Barauni Refinery at a total cost of Rs. 55.70 lakhs. The Plant was scheduled to be completed by 6th May, 1970. It was, however, finally made over to IOC in June, 1972 after a delay of two years. The delay of one year was stated to be due to strike in the plants where M/s. Engineers India Ltd. were getting the equipments manufactured. Another one year was taken in rectification of the defects noticed after the trial runs of the plant. The Committee are surprised to find that the agreement with M/s. Engineers India Ltd. did not even contain provision for levy of penalty for delay in completion of work. The Committee are informed that consequent on the delay the cost of the plant went up by Rs. 6.50 lakh and the profitability was reduced by about Rs. 70 lakhs due to delay in the completion and commissioning of the Plant and of a further amount of 27 lakhs due to shortfall in production during July, 1971 to February, 1972 on account of malfunctioning of the plant. The Committee recommend that the reasons for delay in the completion of the plant and its defective working after commissioning should be thoroughly investigated so as to pinpoint lapses and in order to fix responsibility for the huge loss.

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25	6.109 to 6.112	The Committee note that the Barauni Refinery had to make a distress sale of Raw Petroleum coke at a price of Rs. 80/- per metric tonne to dispose of the large accumulated stock in the Refinery and no alternate adequate market for the same could be found. The agreement entered into with M/s. India Carbon for a period of five years in 1966 was for the sale of lesser quantities of petroleum coke than what was produced. The Committee were informed that this was on account of the fact that the Coke Calcination Plant with a capacity of 60,000 tonnes per annum was proposed to be set up in the Barauni Refinery and to be completed in June, 1969. The plant, however, commenced production in June, 1972. The Committee regret to note that on the one hand, the Corporation failed to find adequate market for raw petroleum coke, on the other hand the completion and commissioning of the Coke Calcination Plant was delayed by about 3 years. The Committee have already commented earlier about the undue delay in the commissioning of the Coke Calcination Plant. The Committee have also earlier commented about the sale of Raw Petroleum Coke to M/s. India Carbon Ltd. ex-Gauhati. They recommend that the distress sale of this product ex-Barauni and the total loss suffered by the Refinery as result of fixation of much lower price for the product should also be thoroughly investigated in order to pinpoint the lapses if any. The Committee also stress that Corporation should see that the price of raw petroleum coke should be fixed realistically keeping in view the current rise in price of crude and the latest demand for the product.
26	6.115 to 6.118	The Committee find that according to the Project Report each of the Atmospheric Vaccum Units I & II and Atmospheric Unit III was to operate for 330 days

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		per annum. The actual operating days during some of the years were much less than that provided in the Project Report. Atmospheric Vacuum Units I and 11 were under shut-down/repair/maintenance/ idleness for 64 days and 40 days respectively during 1967-68, 35 days and 67 days respectively during 1968-69 and 84 days and 65 days respectively during 1969-70. Bottlenecks in the downstream Units such as the Coking Unit, Lube Oil Complex and Bitumen Unit, failure of equipment and utilities have been cited as the reasons for low level of operating efficiency. The Committee regret to note that, due to deficiency in design in the transfer line of Atmospheric Unit I there was leakage and its replacement cost the Refinery Rs. 3.10 lakhs. The Committee recommend that the reasons for defect in design should be investigated in order to fix responsibility for the loss. The Committee also recommend that the Central Service Organisation which has been formed in order to improve the service factor of the Refineries of IOC should go into the technical details in order to suggest measures to improve the operating efficiency of the Refinery. The Committee further note that Atmospheric Unit III was operated for less number of days due to limited availability of crude. The Committee hope that with the processing of imported crude in the Barauni Refinery the operating efficiency of the Unit would improve.
27	6.126 to 6.128	The Committee find that Kerosene Treating Unit I was designed to operate for a period of 330 days in a year. The operating efficiency in some of the years was extremely low. The Unit remained idle for 134 days and under inspection and maintenance for 39 days during the year 1968-69. Lack of feed stock and shortage of sulphur dioxide have been cited as the reasons for remaining under maintenance/idle for longer period. The loss of revenue

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		for shut down has been estimated at Rs. 10,000 per day. The Committee further note the Unit had to be shut down for 52 days and 65 days during 1971-72 and 1972-73 respectively. While the shut down during 1971-72 was longer due to delay in taking up maintenance on account of emergency conditions, the Committee find that low inventory of Sulphur dioxide was the main cause for the shut down for 41 days during 1972-73. The loss of revenue during the period has been estimated at Rs. 7,000 per day. The Committee fail to understand as to why the Corporation should not plan their requirement of sulphur dioxide well in advance and ensure the availability of adequate quantities thereof in time so that need for shut down due to shortage of sulphur dioxide and consequential loss of revenue is avoided. The Committee recommend that this matter should be gone into with a view to taking remedial action to avoid recurrence of such situation in future.
28	6.137 to 6.142	In a written note the Ministry have stated that the figures of consumption of utilities could not be precisely calculated in the absence of adequate metering system. It may be stated that the Designers have provided a number of instruments for checking up of the utilities but these were not adequate for a complete balance. The action for procurement and installation of balance meters has already been taken up. The Committee pointed out that the Coking Unit went into operation in October, 1964. They enquired as to why action in this regard could not be taken earlier. It has been stated that in the initlal years, the efforts were directed towards stabilisation of the unit operations and optimisation of the product patterns so as to maximise the refinery throughput. Since the overall consumption of the utilities for the whole refinery was reasonably comparable to the designed norms, attention was not diverted towards rigorous control of the utilities in the individual unit.

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		After the stabilisation of the refinery operations, this aspect is also being looked into and the action has been initiated after the establishment of the Technical Audit Cells.
		The Committee find that the consumption of Chemicals and utilities in the Barauni Refinery has been widely varying from year to year without indicating any set pattern. The value of excess consumption of utilities in the Coking Unit during the six years ending 31st March, 1972 was about Rs. 13.87 lakhs. The Committee are surprised to find that though the Unit went into operation as far back as 1964 the management have not considered taking action to instal adequate metering equipments for regulating consumption of utilities and it is only now that the technical audit cell is stated to be going into the norms for consumption critically. The Committee recommend that the management should take steps to ensure that the metering equipment are installed without further delay.
		The Committee need hardly emphasise the need for control on consumption of utilities with reference to norms in the interest of economising the processing cost.
		The Committee also hope that the Technical Audit Cell would work out realistic norms for the consumption of utilities to enable the management to control the consumption with reference to such norms timely and to take suitable remedial measures to arrest excess consumption.
		The Committee have already observed elsewhere in the Report that without any accurate system of recording the consumption of utilities it was not possible to make use of the system of costing as an instrument of control and also work out the processing cost on a realistic basis.
29	6.148	The Committee regret to note that finished the products of the value of Rs. 25.36 lakhs were lost during 1966-67 to 1972-73 in the Barauni Refinery

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		during storage and in the process of their loading from the storage tanks to the tank wagons/lorries. The Committee are informed that by proper training, the Management are trying to reduce the losses due to dipping errors or accounting errors, spillages and overfilling. The Technical Audit Cell has also been asked to suggest ways and means to reduce the losses. The Committee fail to understand as to why Management could not have taken timely action to locate the defeciencies in the equipments to plug the loopholes. The Committee are of the opinion that if training programmes had been initiated much in advance and schedules for maintenance drawn up and adhered to, the refinery would not have been forced with this huge loss. The Committee hope that with the measures now being taken, the loss of finished products during storage and also in the process of loading etc. would be reduced to the minimum. The Committee also recommend that the Refinery should with the assistance of Technical Audit Cell fix realistic norms for such losses and ensure that these norms are strictly adherd to.
6.156 6.157		The Committee note that the Refinery had to resort to flaring of gas to maintain a positive pressure in the Refinery and to prevent possibility of air mixing with fuel gas leading to explosive hazards Moreover, there was the problem of disposal of reduced crude. The percentage of gas flared was to the extent of 43.1 per cent in 1966-67, 48.4 per cent in 1967-68, 34.2 per cent in 1968-69 and 20 per cent in 1969-70. In subsequent years it was less than 20 per cent. The Committee are given to understand that had the total gas produced (less the minimum quantity required for flaring) been used as fuel in the Refinery, fuel oil worth Rs. 1.56 crores could have been saved during the years 1966-67 to 1972-73. It was only in January, 1969 that a study was trade by the Refinery authorities which revealed that there was enough scope to increase the firing of gas in the power house. Thereafter steps were taken in 1971 for installing a pressure indicator with the electrical transmission at

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		site and a pressure recorder with low pressure signalling at the boiler control. The Committee were informed that the problem of disposal of coking fuel oil/low sulphur heavy stocks has also since been overcome and the flaring of gas has been reduced to the minimum. The Committee are not happy about the failure of the Management to take action in time to instal the pressure gauge equipments, dispose of reduced crude in order to obviate loss on account of flaring of gas. The Committee recommend that the matter should be examined in depth with the assistance of Technical Audit Cell and in the light of the experience of Refineries elsewhere in order to reduce losses on account of flaring of gas to the absolute minimum. The Committee would like to be informed of the concrete measures taken by Government/Corporation in pursuance of the above recommendation.
31.	6.164	The Committee take a serious note of the fact that although the Commission appointed by Government to go into the question of blaze in the river Ganga near Monghyr in March, 1968 due to accumulation of oil content of the effluent matter in the sandy part of the river bed beyond the discharge point, submitted their report in July, 1969, no final decision has yet been taken by Government/Corporation on the important recommendation made by Commission about discharge of effluent in the main stream of the River Ganges as it would involve heavy capital expenditure of over Rs. 1 crore. IOC have instead improved the treatment of effluents before disposal so as to reduce the oil content to safe level. The Committee feel that the problem of pollution of the river should have been tackled with all seriousness in consultation with C.W.P.C. and all others concerned in the interest of health of the inhabitants of that area. The Committee would like to be informed of the final decision taken in the matter by Government and the progress made in implementation thereof, within six months.

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32	6.169	The Committee find that the actual throughput and the product pattern obtained in the Refinery were not the same as envisaged in the design of the Refinery as a result of which the Refinery suffered cumulative loss of about Rs. 635 lakhs during the period from 1966-67 to 1972-73. The loss would be much more if the losses on account of variances in capacities from the design are also taken into account. The Committee recommend that a technical committee should examine all aspects relating to the product-mix of the Barauni Refinery in order to suggest measures to reduce the losses due to variations in the product-pattern.
33	6.180 to 6.182	The Committee note that though the Project Report envisaged the potential of 50,400 tonnes of liquified petroleum gas per year from the Atmospheric Vacuum Units I and II and 15,000 tonnes per year from the Coking Unit of the Barauni Refinery, no LPG was obtained from the Coking Unit due to unsteady operation of its stabilisation section. There was also delay of about one year in starting the production of LPG in Atmospheric vacuum Unit I due to non-availability of cylinders. The Committee also note that inspite of the gradual increase in the production of LPG from 239 tonnes in 1965-66 to 14,729 tonnes in 1972-73, it is still much short of the potential envisaged in the DPR. Production of off-specification LPG in the earlier years due to non-provision of caustic and water washing facilities for LPG, inadequate number of weigh scales and of filling points at LPG shed, frequent interruptions in the cylinder filling operations due to poor performance of weight scales and leakages from filling guns and irregular off-take of filled cylinders and non-availability/short and interrupted supplies of LPG cylinders have been cited as the reasons for the shortfall in the production of LPG. The Committee are informed that corrective steps had been taken from time to time to solve these problems. It has, however, been stated that the production of LPG could have been increased if cylinder availability was better.

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		The problem of non-availability/shortage of a particular type of steel required for LPG cylinders and the consequent shortfall in the production and marketing of LPG have been dealt with in the Report of the Committee on IOC (Marketing Division). The Committee desire that Government/Corporation should take timely action in future about the procurement of steel either through indigenous sources or through imports to see that lack of cylinders does not depress production. The Committee also hope that maximum possible production of LPG would be achieved in the IOC Refineries as low production of LPG means wastage of valuable gas in flaring, higher consumption and larger import of kerosene or crude which the country can ill-afford at present when it is faced with the oil crisis.
34	6.188 6.189	The Committee find that the work of modernisation of the LPG bottle filling plant was entrusted to M/s. Engineers India Ltd. in January, 1969. Though the work was scheduled to be completed in January, 1970. It was, actually completed only in March, 1972, i.e. after more than two years during which period the essential facilities such as hydraulic testing, washing and painting of cylinders could not be provided. The Committee are surprised to note that the question of levying penalty on M/s. Engineers India Ltd., for the delay in the completion of the work is still under examination of IOC, even after a lapse of two years. The Committee recommend that the reasons for the delay should be investigated by Government and the matter finalised without any further delay.
35	7.7 7.8	The Committee find that the Gujarat Refinery was designed for a capacity of 3 million tonnes per annum. The capacity has been increased to 4.3 million tonnes by bringing about operational changes an modifications. The existing utilisation of capacity is, however, 3.8 million tonnes per year because

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		ONGC is unable to supply the full quota of crude. The Committee recommend that ONGC should step up efforts to increase the supply of crude to the Refinery.
		The Committee need hardly point out that any further expansion of the Refinery should be done only after fully ensuring the desired quota of indigenous/ imported crude.
36	7.18 7.19	The Committee note that 40 per cent of the Refinery's design drawings were prepared by Indian Engineers in collaboration with a small team of seven Russians, and the expansion of Gujarat and Barauni Refinery was done 100 per cent by the same organisation. The Refinery utilised about 60 per cent of equipment and materials from indigenous sources and about 75 per cent for the expansion to three million tonnes. The expansion of the Refinery to 7.3 million tonnes is being designed and built *without* foreign collaboration.
		The Committee hope that Government/Corporation would emulate the example of Gujarat Refinery while planning and executing the expansion/creation of capacity in the country during the Fifth Five Year Plan.
37	7.24	The Committee note with satisfaction that the Corporation was able to effect a saving in the capital cost of the Refinery. The actual expenditure incurred by the Refinery for the two million tonnes capacity was 26.27 crores as against the project estimate of Rs. 30.99 crores. The actual expenditure on the expansion of Refinery from 2 million tonnes was Rs. 2.4 crores as against the estimate of Rs. 2.9 crores. The actual expenditure on the Udex Plant was Rs. 2.56 crores as against the project estimate of Rs. 2.69 crores.
38	7.26 7.27	The Committee find that the concept of staff and line function was introduced in the Gujarat Refinery about 3½ years ago. The new concept of "Technical Audit" has also been introduced in this Refinery. As a result of proper inspection and prevention maintenance, consumption of utilities, fuels

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		and chemicals have been reduced thereby increasing the yield and reducing the processing cost. While the Committee appreciate the steps taken by the Gujarat Refinery they hope that similar steps would be taken in the other IOC refineries in order to bring about improvement in operating efficiency and effect economies in costs.
39	7.34 to 7.37	The Committee find that a contract was signed with U.S.S.R. suppliers for supply of equipment and materials weighing 15,350 tonnes for the setting up of the Gujarat Refinery. Subsequently, 204.196 tonnes were deleted from the supply schedule of the contract in terms of the protocol dated 9th October, 1964, as these materials were available from indigenous sources. The Committee also note that the protocol was silent about the possible reduction in the contract price in the case of deletion of the quantity from the contracted supply. The Committee regret to note that though the supplies under the protocol were completed as early as 1966, it was only in February, 1970 after a lapse of six years from the date of protocol, that a claim for Rs. 15.76 lakhs was preferred against the foreign suppliers on account of the value of deleted items weighing 204.196 tonnes (Rs. 10.92 lakhs) and also for defective materials and other causes (Rs. 4.84 lakhs). This claim has not been accepted by the suppliers so far. The Committee are also surprised that the management has not sought the assistance of Government for the recovery of the claim in spite of the long delay in the settlement of the claim by the foreign suppliers. The Committee are now informed that the suppliers have agreed to re-examine the matter. The Committee desire that the matter should be pursued vigorously with a view to effecting an early settlement of the claim. The Committee are informed that it was not possible to work out the quantity and value of Russian

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		materials that might still be lying in stock in the Refinery. The Committee fail to understand as to why the materials received under the agreement should not have been kept separately throughout. The Committee recommend that the matter should be investigated to fix responsibility for the lapses. The Committee should be informed of the action taken.
40	7.45 7.46	The Committee find that there has been delay of 3 to 12 months in the completion of the various units of the Gujarat Refinery due to delay in the supply of equipment and detailed working drawings by the collaborators. The delay was also stated to be due to occasional strike by the workers of the contractors. The Committee reiterate their earlier recommendation in paragraph 122 of their 36th Report (3rd Lok Sabha) that the delay in the execution of schemes regarding creation/expansion of refinery capacity in the country should be avoided at all costs so that import of petroleum products involving huge amount of foreign exchange is reduced to the minimum.
41	7.53 7.54	The Committee find that the Udex Plant of the Gujarat Refinery was originally scheduled to be completed by December, 1967 it was, however, actually completed in December, 1968. There has been an initial delay of 9 months as the bank guarantee already issued to ONGC had to be transferred in favour of IOC and the import licence had to be revalidated, consequent on the transfer of the Refinery from ONGC to IOC. The date of contract with the Italian firm was accordingly shifted from December, 1964 to September, 1965. There had also been a delay of one year in supplying of the basic data by the owners to the contactors (3 months) in the delivery of purchase specification and equipment (6 months) and in the deilvery of drawings and specifications (3 months). The Committee are not happy over such administrative delays which had resulted in delay in the

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		erection and commissioning of the Plant. They hope that such delays would be avoided in future.
42	7.65 to 7.67	The Committee note that the Udex Plant was set up on the assumption that the Caprolactum Plant of Gujarat State Fertilizer Corporation, the Hindustan Organic Chemicals and two or three other industries would be able to absorb aromatic chemicals such as Benzene, Toluene, etc. But the establishment of Capro-lactum Plant and the Hindustan Organic Chemicals was very much delayed. The increased Benzene production in the Steel Plants further reduced the sale of Benzene from the Udex Plant. As a result the plant could achieve only 26 per cent of the rated capacity during 1969-70. It has, however, gradually improved its performance during the subsequent years. During 1970-71, 1971-72 and 1972-73 it achieved 47.22 per cent, 67.27 per cent and 87.21 per cent of its rated capacity. The Committee feel that the erection and commissioning of the Udex Plant should have been co-ordinated with the establishment of factories consuming Benzene and Toluene, so that there might be an assured market for the products of the Plant. The Committee are informed that the Management have in hand a scheme to expand the capacity by 25 per cent. The Committee hope that the Corporation would profit by their experience and ensure adequate markets for Benzene and Toluene before undertaking the expansion scheme.
43	7.89	The Committee note that Gujarat Refinery has been able to achieve a higher percentage of yield than envisaged in the Detailed Project Report by certain steps like economy in the usage of own fuel, reduction of power, steam and water and effecting control by technical auditing, utilisation of more and more gas as own guel resulting in less flare. watching and controlling the losses arising at various points during storage, handling, loading operation, etc. The Committee recommend that the Corporation should consider taking similar measures in the other

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		Refineries also so as to improve the operating efficiency and effect economy.
44	8.22 to 8.26	The Committee find that the profitability of the three refineries varied widely from year to year. In some years the fluctuations in the working results are quite disconcerting. Gauhati Refinery suffered a loss of Rs. 23.76 lakhs during 1970-71 as against a profit of Rs. 68.13 lakhs during the previous year. Lower throughout, fixation of higer price for crude due to adoption of medium range tanker freight rates, import of power from the Assam Electricity Board due to capital maintenance of refinery's own turbo-generators are stated to be the reasons for the loss during 1970-71. During 1971-72 and 1972-73 the Refinery made a profit of Rs. 37.87 lakhs and Rs. 72.78 lakhs respectively. Barauni Refinery made a profit of Rs. 170.54 lakhs, Rs. 343.93 lakhs and Rs. 277.98 lakhs during the years 1970-71, 1971-72 and 1972-73 respectively. The decline in profit during 1972-73 as compared to 1971-72 was due to higher price paid for the imported crude. Gujarat Refinery made a profit of Rs. 168.34 lakhs, Rs. 725.43 lakhs and Rs. 643.31 lakhs during the years 1970-71, 1971-72 and 1972-73 respectively. The shortfall in profits during 1970-71 was due to liability of Rs. 245 lakhs towards increase in the price of crude oil arising out of an award by the Arbitrator. The Committee also find that the expenditure per tonne of crude processed in Gauhati and Barauni Refineries was much higher than in Gujarat Refinery. In case of Gauhati Refinery it was Rs. 41.65, Rs. 35.60 and Rs. 37.78 during the years 1970-71, 1971-72 and 1972-73 respectively and for Barauni it was Rs. 34.41, Rs. 33.96 and Rs. 35.02 respectively as against Rs. 12.92, Rs. 12.37 and Rs. 13.73 respectively for the Gujarat Refinery. The operating cost in the Gauhati and Barauni Refineries was also much higher than the Gujarat Refinery. As against

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		the operating cost of Rs. 1,118 per 100 tonnes of crude processed in the Gujarat Refinery during 1972-73, the operating cost in the Gauhati and Barauni Refineries was Rs. 3,573 and Rs. 3,403 respectively. The recovery of products in the Gauhati and Barauni Refineries was 90 and 91 tonnes as compared to 92.5 tonnes in Gujarat Refinery. The yield in the ESSO, Burmah Shell and Caltex Refineries was 95.0, 93.8 and 91.5 tonnes respectively. It has been stated that there are several factors which vitiate comparison between different refineries with regard to profitability as it was dependent upon several variable factors such as location and capacity of the Refinery, quality of crude processed, capacity utilisation and the price of crude, etc. The Management have, however, admitted that there is need for making lot of improvement in the working of the IOC refineries and that it would take a few more years for the IOC refineries to come to the standard of refineries in the private sector. The Committee are informed that a Central Service Organisation has been set up to give advice on ways and means to improve the services and a Technical Audit Cell is examining the consumption pattern of various fuels, chemicals and utilities in order to fix norms for the different Units in the refineries. The Committee hope that with the assistance of the Technical Audit Cell and Central Service Organisation, it would be possible to effect economies in operating costs, attain maximum recovery and increase the profitability of the refineries in the comings years.
45	9.11 9.12	The Committee find that during the years 1966-67 to 1972-73, the value of the stores held in stock varied between 29 to 39 months consumption, 24 to 50 months consumption and 9 to 34 months consumption in the Gauhati, Barauni and Gujarat Refineries resepctively. Purchases have also been in excess of the consumption of stores judged from their value. The Committee find that maximum and minimum limits have been fixed only for 645 items out of

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		9,978 items in Gauhati, 7,329 items out of 16,406 in Barauni and 5,204 items out of 11,086 items in Gujarat. The Committee regret to note that even now the construction materials have not been completely segregated from those required for operation and that surplus stores worth Rs. 54 lakhs are still being carried by the refineries. Physical verification of stores was not done in the three refineries according to the prescribed procedures. Though such a verification is required to be done annually, it was not done at all in Barauni during 1970-71 and only 1.6 per cent of the work was done in 1972-73. The Committee are surprised to note that the management fixed norms for physical verification only in August, 1972 and the work of physical verification according to these norms is still in progress. The Committee further note that although the Management decided to streamline the stores and purchase procedure in 1965 and the Controller of Stores and Purchases was entrusted with the task of compiling stores and procedure in October, 1965, it was only after three years in 1968 that a draft was produced and even after it was finalised in 1969, a firm of consultants appointed for streamlining the Materials Department at Barauni was asked to draw up a Purchase Policy and Procedure Manual. Though a draft manual was given by the consultants in September, 1970 this was finalised in January, 1973 and is now stated to be under the examination of Finance Director to whom it was referred to by the Board. The Committee feel concerned about the inordinate delay of over 8 years in evolving comprehensive stores and purchase procedure. The Committee recommend that the Manual should be finalised without any further delay and the entire procedure of Stores and Stock control should be streamlined, so as to prevent excessive purchases and obviate accumulation of surplus stores.
46	10.6	The Committee find that the number of men in position in the Gauhati, Barauni and Gujarat Refineries as on 31st March, 1973 were 116 per cent,

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		105 per cent and 31 per cent more than that indicated in the respective Detailed Project Reports of these Refineries. They also note that on 31st March, 1973 about a thousand persons were in excess of the strength fixed by the Management themselves for the three Refineries. The Committee are informed that the norms indicated in the DPR's were not applicable as many of the items were not taken into account at the time of drafting of the DPR's. The refineries were faced with the problem such as absorption of workers engaged in the construction of the project, implementation of arbitration awards, etc. and even if the surplus staff is identified the retrenchment of such staff would pose serious problems. In the opinion of the Committee, deployment of staff in excess of requirement only reduces the efficiency and increases the overheads. The Committee also feel that surplus construction staff should be gainfully employed in other projects under construction. The Committee recommend that the Government/Corporation should under-take a review of the staff strength in all the three refineries and identifiy the staff in excess of requirement, and make concerted efforts to absorb the surplus staff gainfully in other Central or State Projects that are coming up in the area.
47	10.10 10.11	The Committee find that about Rs. 218.80 lakhs had been paid as overtime in the three Refineries during the years 1967-68 to 1972-73. The overtime bill has shown a gradual increase during these years. During the year 1972-73 the percentage of overtime to salaries and wages was 13.45, 21.16 and 10.36 in the case of Gauhati, Barauni and Gujarat Refineries respectively. The Committee are surprised that on the one hand the refineries are facing the problem of surplus staff, on the other hand overtime amounting to several lakhs of rupees is being paid to the employees. Although the Management stated in 1971 that efforts were being made to control the overtime to the

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		minimum, yet the overtime bill goes on unabated. The Committee need hardly stress that the overtime payments act as a disincentive to efficiency. They, therefore, recommend that Management should adopt strict measures so as to keep the overtime bill to the minimum and thereby reduce the expenses on overheads and economise in processing costs.
48	10.15 10.16.	The Committee note that the Internal Audit Department was reorganised in March, 1969 and the Board of Directors desired that important points noticed by it should be brought to their notice from time to time. The Internal Audit was also expected to conduct a critical review of systems, procedures and operations of the refineries as a whole. The Committee are surprised to note that it was only in August, 1971 that important points were brought to the notice of the board of Directors for the first time. A Critical review of systems, procedures and operations of the Gauhati and Gujarat Refineries was conducted only in 1972-73. Critical review of production units and utilities in the Barauni Refinery was done during 1971-72 and that of LPG production and utilisation of Coke Calcination Plant was undertaken in 1972-73. The Committee need hardly emphasise the importance of Internal Audit as one of the essential tools of management control. They, therefore, recommend that the Corporation should activise and strengthen the Internal Audit Cells in the refineries and make use of the reports of Internal Audit to set right the deficiencies, plug loopholes and cut out wastages in the various Units.

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