E. C. No. 85

ESTIMATES COMMITTEE

1957-58

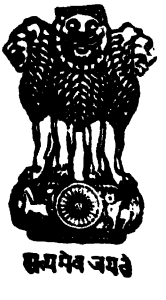
TWENTY-SECOND REPORT

(SECOND LOK SABHA)

MINISTRY OF STEEL, MINES AND FUEL

DEPARTMENT OF MINES AND FUEL
OIL DIVISION

Oil and Natural Gas Commission,
Oil Refineries, etc.



LOK SABHA SECRETARIAT
NEW DELHI
April, 1958

CORRIGENDA

TWENTY-SECOND REPORT OF THE ESTIMATES COMMITTEE (SECOND LOK SABHA) ON THE MINISTRY OF STEEL, MINES & FUEL (DEPARTMENT OF MINES & FUEL - OIL DIVISION).

Page 4, lines 7-8: *for* 'Ministry of Natural Resources & Scientific Research' *read* 'Ministry of Steel, Mines & Fuel'.

line 12 *for* 'Minister of Natural Resources & Scientific Research' *read* 'Minister for Mines & Fuel'.

line 24 *for* 'may' *read* 'might'.

Page 5, para 12, line 4 *Insert* 'of' *between* members' and non-officials'

Page 6, para 16 line 3 *Insert* of *before* Geology

para 17, line 2 *for* 'Geology' *read* Geologist'.

line 3 *for* 'Geophysics' *read* Geophysicist'.

Page 8 para 23 line 5 *for* 'reconstitutions' *read* reconstitution'.

para 25, last line *for* 'considered' *read* reconsidered'

Page 9, para 29, penultimate line *Insert* have' *between* who' and studied'.

Page 12, para 36, sub para, line 8 *for* twelve folds' *read* twelve fold'.

Page 14, para 39, Table, item 4 *for* '(10,000)' *read* '(10,000')'

para 40, line 4 *for* absence' *read* absence

P T O

Page 21, para 57, Table: *for* 'Bicetic logging' *read* 'Electro-logging'.

for 'topo-geocetical' *read* 'topo-geodetical'.

Page 25, para 64 last line: *for* 'and 1955, 1956-57' *read* 'and 1955-56-57'.

Page 26, para 65, penultimate line: *for* 'party' *read* 'parties'.

Page 32, para 79, line 3 from bottom: *for* 'half-year' *read* 'half yearly'.

Page 34, line 2: *Insert* 'Paris' *after* 'M/s. Krebs & Cie'.

472-L S.R.P. - 1,700.-20.6.58

CONTENTS

MEMBERS OF THE ESTIMATES COMMITTEE, 1957-58

1. Shri Balvantray Gopaljee Mehta—*Chairman.*
2. Shri S. A. Dange
3. Shri Jogendra Singh
4. Shri Mahavir Tyagi
5. Shri Satyendra Narayan Sinha
6. Shri Radha Charan Sharma
7. Shri Ranbir Singh Choudhari
8. Shri Gopalrao Khedkar
9. Shrimati Sucheta Kripalani
10. Shri R. R. Morarka
11. Shri M. Thirumala Rao
12. Shri J. Rameshwar Rao
13. Shri C. R. Narasimhan
14. Shri Amjad Ali
15. Shri R. Ramanathan Chettiar
*16. Shri Ahmed Mohiuddin
17. Shrimati Renuka Ray
18. Shri Uma Charan Patnaik
19. Shri Raghubir Sahai
20. Pandit Dwarka Nath Tiwary
21. Shri Govind Malaviya
22. Shri R. L. Jangde
23. Shri N. C. Kasliwal
24. Shri Dodda Thimmaiah
25. Shri M. L. Dwivedi
26. Shri A. E. T. Barrow
27. Shri V. P. Nayar
28. Shri R. K. Khadilkar
29. Shri B. K. Gaikwad
30. Shri Shraddhakar Supakar.

SECRETARIAT

Shri S. L. Shakdher—*Joint Secretary.*
Shri A. R. Shirali—*Deputy Secretary.*
Shri R. K. A. Subrahmanya—*Under Secretary.*

*Ceased to be a member on his appointment as Deputy Minister w.e.f. 2-4-1958.

INTRODUCTION

I, the Chairman, Estimates Committee, having been authorised by the Committee to submit the Report on their behalf, present this 22nd Report on the Ministry of Steel, Mines and Fuel (Department of Mines and Fuel—Oil Division)—Oil and Natural Gas Commission, Oil Refineries etc.

2. A statement showing an analysis of the recommendations contained in this report is also appended (Appendix IV).

3. The Committee wish to express their thanks to the Officers of the Ministry of Steel, Mines and Fuel (Department of Mines and Fuel—Oil Division), Oil and Natural Gas Commission, Executives of the Indo-Stanvac Project, Calcutta, Messrs. Burmah Shell Refineries Ltd., Bombay, Standard Vacuum Refining Company of India Ltd., Bombay and Caltex Oil Refining (India) Ltd., Visakhapatnam for placing before them material and information in connection with the development of the Oil Industry. They also wish to thank Sarvashri W.B. Metre (Senior Geologist, Assam Oil Co., Ltd.), P. Govindakrishnayya (Burmah-Shell Ltd., Bombay) D. D. Lohia (Member, State Planning Advisory Board, Assam) for giving evidence and making valuable suggestions to the Committee.

NEW DELHI;
The 22nd April, 1958.

BALVANTRAY G. MEHTA
Chairman,
Estimates Committee.

OIL & NATURAL GAS COMMISSION

I

INTRODUCTORY

A. General

1. This century has been described as the 'Oil Age'. It was acknowledged by Mr. Winston Churchill at the close of the First World War that "the allies floated to victory on the wave of oil". As early as in the twenties, President Coolidge of U.S.A. had stated that the supremacy of a nation might be determined by the possession of available petroleum and its products. The end of the Second World War saw a beginning of unprecedented changes in the world oil picture. As a result, between 1951 and 1955 alone, the world production of oil rose by 30% from 609 million metric tons to 786 million metric tons, while the petroleum consumption in the U.S.A. in 1955 was approximately 70% above the 1946 level, being well over 8 million barrels daily. In keeping with this trend, in India also the consumption of petroleum products increased from 203 lakhs of barrels in 1948 to 398 lakhs of barrels in 1956.

2. The heavy demand for oil since the war is mainly due to the expanded energy requirements of various industries, more particularly the growing defence industries, the expansion of transport services, particularly air, the mechanisation of agriculture, the high rate of conversion from coal to oil-burning for production of energy, etc. Thus, in America nearly 76% of all energy used at present comes from oil. In many other countries also, oil enjoys an equally dominant position and in fact it has influenced world politics a great deal smce the last war. The strategic importance of oil to the national economy, therefore, requires that this country should also give due importance to oil in its developmental plans. An important step in this direction was taken in 1948 and repeated in 1956 when in the Industrial Policy Resolution it was specifically provided that the future development of oil in the country shall be the exclusive responsibility ot the State but without excluding the scope for co-operation by private enterprise.

B. Historical

3. The history of oil in India dates from 1865 when the first attempts to explore oil were made on the recommendations of the Geological Survey of India in Upper Assam. Before India achieved Independence only two foreign firms, namely, the Assam Oil Company and the Attock Oil Company in Punjab did prospecting in this country. The Assam Oil Company which was later incorporated with the

Burmah Oil Company started work on the Digboi wells in 1883, struck oil in 1892 and now it has in the length of about 2½ miles nearly 500 oil wells which supply about 8% of India's oil requirements. To this Company also goes the credit of installing the first Oil Refinery in India about 36 years ago. The bulk of the oil and petroleum requirements of the country, however, continued to be imported from abroad.

4. In 1945, the Government of India, realising that some governmental effort was necessary to explore the possibility of finding oil and natural gas in the different sedimentary regions of India, initially created the post of a Petroleum Geologist in the Geological Survey of India. During the period 1947-55, he and his staff carried out some reconnaissance and mapping in some districts of Punjab. Some 42 reports on oil exploration were prepared but were not published. One of them related to Jwalamukhi where a recommendation for drilling was made. No action is reported to have been taken on any of these reports until after 1956.

5. In late 1955, a Directorate for Natural Gas and Oil was set up under the Ministry of Natural Resources and Scientific Research. During the 8-9 months it functioned, a few reconnaissance surveys were carried out, but the efforts were mainly directed towards the recruitment and training of 52 geologists and 70 geophysicists to enable systematic and intensive work to be undertaken in the various sedimentary regions of the country.

C. Malaviya Delegation & After

6. In 1955 in pursuance of a decision of the Government of India to intensify the prospecting for oil in the country a delegation of technical personnel under the leadership of Shri K. D. Malaviya, Minister of Natural Resources, visited the U.S.S.R. Sweden, the U.K., the Netherlands, Switzerland, Rumania, France and West Germany to study the status of the oil industry in these countries and to ascertain the availability of equipment and facilities for training Indian personnel in oil exploration work to be done in India.

7. Among the Delegation's recommendations were :—

(i) Extensive exploration for oil and natural gas by Government of India as a *National Enterprise* in areas not covered by lease, etc.;

(ii) The setting up of a high-powered Commission or Trust for the purpose; and

(iii) To invite immediately a team of oil experts from the U.S.S.R. to advise on the programme of exploration for oil.

8. Later, a team of Soviet oil experts headed by Mr. N. A. Kalinin was invited to India as recommended by the Delegation. In addition, other foreign experts, *e.g.*, Dr. A. I. Levorsen from the U.S.A., Dr. Bentz from West Germany and M. Giraud from France also came to India under the various aid schemes examined the oil potentialities of the country and submitted reports. All the foreign experts

generally agreed regarding the prospects of finding oil in areas recommended by the Indian geologists. While the reports of the American and German experts mainly dealt with the technical aspects, the Soviet experts report submitted in April, 1956 furnished a detailed and integrated plan for the Second Five Year Plan period for undertaking exploration work. It also recommended the setting up of a high-powered Oil and Gas Commission for the purpose.

II

ORGANISATIONAL SET-UP

A. Status of Commission

9. The Oil and Natural Gas Commission (O.N.G.C.) was set up by Government in August, 1956 to undertake geological, geophysical and other oil exploration work, to establish production when oil is found etc. on the basis of the recommendations made in the reports of the delegation which went to U.S.S.R. etc. and of the Soviet oil experts. It functions, however, as a subordinate office of the Ministry of Natural Resources and Scientific Research even though the Malaviya Delegation as well as the Soviet oil experts had recommended that it should be a high-powered and in effect an autonomous body. It is invested with most of the powers of a Head of a Department only, though the Minister of Natural Resources and Scientific Research is himself at the head of it and a representative of Finance is its Member, though in certain matters such as administrative approval to schemes etc. it has been given larger powers. *The Committee feel that if the O.N.G.C. is to function efficiently as an industrial body, it must be armed with sufficient powers and given sufficient status so as to provide flexibility in administration as well as operation.* They understand that the present procedures, particularly in regard to recruitment and financial matters, have at times hampered the efficient progress of work of the O.N.G.C. The Committee were informed in this connection that a proposal to convert the Commission into a statutory organisation with wider delegation of powers was under consideration but that it may take some time. Meanwhile, the question of delegating additional powers to the Commission was under consideration. *The Committee fail to understand why there should be any delay in taking a decision on such an important organisational matter on which the successful and effective functioning of the venture to find oil in the country depends to a considerable extent. They recommend that an early decision be taken to convert the Oil and Natural Gas Commission into an autonomous body with suitable provision for control by Parliament.**

B. Composition of Commission

10. The present composition of the O.N.G.C. is as follows:—

(i) Minister for Mines and Oil—*Chairman.*
(ii) Member-Technical.
(iii) Member-Financial and Non-Technical.

---

*The Committee have since been informed by the Ministry of Steel, Mines and Fuel that the Oil and Natural Gas Commission have since suggested that the question of conversion of O.N.G.C. into statutory organisation should be held in abeyance and the question of delegation of additional powers need not be pursued at this stage as they intend to formulate proposals for reorganisation of the O.N.G.C. on the lines of Atomic Energy Commission recently constituted.

The Committee feel that a Minister should not be burdened with the day-to-day work and management of the Commission and that a Chairman or Vice-Chairman preferably with technical qualifications should be appointed on a full time basis to execute the policies laid down by Government.

11. *The Commission consists of only one technical Member who is expected to carry out all the technical activities of the Commission. This might be satisfactory in the early stages of the exploration work but from a long-term view it does not seem adequate. The absence of experienced technical personnel at the top could lead to wrong direction which considering the magnitude of the expenditure might result in infructuous expenditure. The proposed statutory Commission should, therefore, consist of experienced geologists and geophysicists amongst its technical members, so that the Commission may have the benefit of technical advice from more than one member. The Committee recommend that the O.N.G.C. should be re-constituted particularly in view of the proposed expansion in its activities.*

12. *The Committee further recommend that when according statutory status to the O.N.G.C., care should also be taken to ensure that the top management consists besides the Chairman and technical members non-officials with experience in business and finance but with no financial interest in the industry.*

13. *The Committee are aware that there is a dearth of qualified persons in the country for holding high technical posts. They would, therefore, suggest as a purely temporary measure that it might perhaps be advantageous to employ an experienced and reliable foreign oil adviser to advise the O.N.G.C. in technical matters as well as during discussions with foreign oil concerns with whom the Government and Commission come into contact. For this purpose, the feasibility of seeking assistance from the World Bank or some other similar Agency or under one of the Aid Schemes should be examined.*

C. Functions

14. The functions of the Oil and Natural Gas Commission are as follows:—

(i) Advising the Central Government on matters relating to exploration, exploitation and refining of mineral oil and natural gas resources.

(ii) Undertaking geological and geophysical surveys, drilling and other prospecting operations for exploitation of mineral oil and natural gas.

(iii) Proving and estimating workable reserves of oil and natural gas deposits by conducting drilling and other prospecting operations independently or in conjunction with other Government or private organisations.

(iv) Establishing production of oil including preliminary processing and storage.

(v) Administering and implementing Agreements with oil Companies, inspecting oil fields held by private oil concerns to ensure that there is no wastage and introducing improved methods of recovery.

(vi) Setting up and organising geological and chemical laboratories and geophysical and engineering workshops in connection with the exploration, production or refining of oil.

(vii) Compiling and publication of statistics of the oil and natural gas in India and maintaining information regarding world production, trade, mining rules and other related matters.

(viii) Publication of journals and bulletins on matters relating to oil and gas.

15. Despite this comprehensive list of functions given to the O.N.G.C. so far, the Commission has confined its activities primarily to matters relating to exploration for oil and natural gas resources and that too, in a few selected centres such as Jawalamukhi, Jaisalmer, Cambay, etc. The other functions including that relating to the working of agreements with oil companies for exploration and prospecting, inspecting oil fields held by private oil concern, etc. have not yet been taken up. The question of refining of oil and agreements entered into for the purpose is at present not within the purview of the Commission. *The Committee feel that having set up a technical body to deal with exploration, exploitation and production of oil in the country, it should be given the function and responsibility of administering all the activities pertaining to oil in the country, such as exploration including private participation, exploitation, production, refining, storage, distribution, inspection, conservation etc., so as to deal with the subject comprehensively. They recommend that this aspect should be given due consideration when the question of giving statutory status to the O.N.G.C. is considered.*

D. Administrative set-up

16. The present organisational set-up of the Commission is given in Appendix I. Its present set-up consists of three directorates, namely, Geology, of Geophysics and of Engineering besides the Commission's office under a Secretary. The three technical Directorates are under the charge of the Member (Technical).

17. Each of the three directorates consists of one Director and one or more senior officers like Superintending Geology, Superintending Geophysics, Drilling Engineer etc. It is understood that there is a proposal to create three new posts of Chief Geologist, Chief Geophysicist and Senior Drilling Engineer. The *Committee have recommended earlier that the Commission should consist of a full time Chairman and technical members. Once this is done it should be possible for the members to function as heads of the directorates and it might no longer be necessary to retain the posts of three Directors.*

These suggestions would also be more or less in accord with those made by the various oil experts who visited the country. The Committee, therefore, recommend that these aspects should be borne in mind when reconstituting the O.N.G.C. and also while creating the posts of Chief Geologist, Chief Geophysicist and Senior Drilling Engineer. This is particularly necessary so that the suggested reconstitution itself may not result in more senior officers being engaged than necessary.

E. Branch Offices

18. The Headquarters of the O.N.G.C. are at Dehra-Dun while its present activities in so far as operations are concerned are at Jawalamukhi (Punjab), Jaisalmer (Rajasthan), Cambay (Bombay), Ganga Valley etc. The Commission maintains branch Offices at Jawalamukhi, Jaisalmer, Calcutta and Delhi. There is also a proposal to open a Branch Office at Bombay for attending to the work of Cambay parties and Branches at Hoshiarpur and Baroda.

19. The main reason for the existence of a Branch Office at Calcutta seems to be that the O.N.G.C. Directorate functioned from Calcutta before it was converted into a Commission and shifted to Dehra Dun. Its main functions are to look after receipt of stores from abroad, purchases, liaison with G.S.I., SVOC (who are conducting drilling operations in West Bengal) etc. It is stated that it also acts as the base camp for equipping the Sibsagar Drilling Project and Geophysical prospecting project. The number of staff employed here is near 45 including one Senior Geophysicist, and administrative officer and about a dozen drilling assistants working in drilling locations with headquarters nominally at Calcutta. The expenditure thereon in 1957-58 was nearly Rs. 92,000. This, it was stated, would increase when more staff was posted.

20. The functions of the Delhi Office consist mainly of liaison with various Ministries, Foreign Embassies, Trade Representatives, the D.G.S. & D. in making purchases and the C.P.W.D. in construction work, transport of equipment and reception of foreign visitors, etc. The number of staff employed here is 20 with one Deputy Secretary and a Transport Officer besides the Member (Finance and non-Technical), who is stationed at Delhi. The expenditure thereon in 1957-58 was nearly Rs. 48,000. This, it was stated, would increase when more staff was posted.

21. The Jawalamukhi office employs nearly 100 men including mechanics and drillers involving an expenditure of Rs. 1.34 lakhs mainly at the drilling site while the Jaisalmer Office employs nearly 10 men involving an expenditure of over Rs. 7,000 mainly on custody of stores.

22. ***The Committee feel that the Branch Offices of the O.N.G.C. have grown up in a somewhat haphazard fashion employing technical staff in cities as well as large office staff and lower staff. The Branch Office at Delhi, particularly, seems to have very little justification since***

the work, if any, could be done by the Ministry itself. It employs even a Private Secretary (Rs. 300-400) besides one selection grade stenographer (Rs. 200-300) *attached to Member (Finance). Similarly the Jawalamukhi Office includes a Public Relations Officer who is stated to be mainly concerned with land acquisition etc. Further, the Branch Office at Calcutta might concentrate on work relating to liaison with the Indo-Stanvac Project. The Committee, therefore, recommend that there should be a complete review of the functions of the Branch Offices particularly in regard to the receipt and purchase of stores with a view to their abolition or at least a reduction in their strength.*

23. In the foregoing paragraphs the Committee have suggested a review of the organisational set-up of the O.N.G.C. The Commission have themselves admitted that "we are not yet systematically organised". *The Committee recommend that the Commission, particularly after the suggested reconstitutions, should devote its urgent attention to setting all its organisation affairs on a systematic footing.*

F. Ministry of Steel Mines and Fuel

24. As mentioned earlier the O.N.G.C. is at present only a subordinate office of the Ministry of Steel, Mines and Fuel. Besides the supervision and control which this relationship imposes, the Ministry is also responsible for the supervision of the work relating to the grant of licences and leases for exploration and prospecting, petroleum legislation, production of oil in the public sector, agreements for setting up refineries, etc. At present the staff employed in the Ministry for this purpose consists of the following:—

Joint Secretary	1	
Deputy Secretary	1	
Under Secretaries	4	(including one Deputy Petroleum Officer).
Asstt. Petroleum Officers	2	
Section Officers, etc.	5	

25. The Committee were informed that to cope with increasing amount of policy work at secretariat level, there was a proposal to have one additional Deputy Secretary and two Under Secretaries in the Department of Mines and Fuel, particularly to deal with the various Project Reports connected with the refineries. *While the Committee agree that policy matters on which Government decisions are required have to be dealt with in the Ministry, they feel that with autonomous set-up and with increased functions and responsibility recommended by them for the O.N.G.C., the work undertaken in the Ministry as well as the staff employed thereon should be reduced and handed over to the O.N.G.C. The Committee recommend that meanwhile the proposals for increasing staff in the Ministry be considered.*

26. The Committee understand that a Standing Committee was constituted on the 11th September, 1957, with the following terms of reference:—

(a) To study further the assumptions, the basic data and other factors taken into account by the Refinery Location Committee in recommending refinery location at Calcutta, Barauni and Dhubri, etc.

(b) The most practical method of using, or disposing of, the crude in the national interest.

(c) The best distribution area for the products of the refinery or refineries, based on Assam crude.

(d) To determine to what extent the petroleum products being imported at present could be manufactured in India.

(e) To estimate the country's additional requirements of petroleum products by 1962, and by 1967, and to recommend the additional refining capacity that should be installed in the country so as to attaining self-sufficiency.

(f) To consider the question of appointing consultants to undertake detailed economical project surveys on specific issues concerning the petroleum industry and to advise the Government on matters relating to such issues; and

(g) To advise on any other matter regarding oil and gas which may be referred by Government to the Committee from time to time.

27. The members of the Standing Committee are all officials representing the technical, transport and other Government interests. Even apart from its composition the Standing Committee is so far reported to have met only on two occasions *viz.*, on 19-9-57 and 13-2-58.

28. *The Committee feel that to be an effective advisory body the Standing Committee should be consulted on all important matters relating to the oil industry in India, e.g., exploration, oil and petroleum laws, exploitation, production, refining, collaboration with private concerns, agreements, prices, transport, etc...Its advice should be available to the O.N.G.C. besides the Ministry particularly after the former is given independent status as recommended by the Committee elsewhere.*

29. *The Committee further suggest that the Standing Committee on Oil should be reconstituted and made broadbased so as to give representation on it not only to the various official interests concerned but also the State Governments likely to be interested and non-official members of legislatures who studied the subject, mining interests etc. This broadbased Committee might then form sub-*

Committees to deal with groups of allied subjects so as to make for speedy and businesslike discharge of work.

30. *The Committee feel that, besides the above Standing Committee, it might be desirable to form a Consumers Council to protect the consumer interests of various petroleum products. They, therefore, recommend that this question be expeditiously examined.*

31. *The Committee feel that pursuant to the provisions of the Industrial Policy Resolution of 30th April,* 1956, *which envisaged* inter alia *that workers and technicians should, wherever possible, be associated progressively in management and enterprises in the public sector should set an example in this respect, the Oil and Natural Gas Commission might set up a workers council.*

G. Other Survey Organisations

32. The G.S.I. is the oldest surveying institution in India and as such until the O.N.G.C. was formed, it conducted in a limited way the survey work for exploration of oil also. Later, two bodies, the I.B.M. and the O.N.G.C. were created with a nucleus of staff drawn from the G.S.I. to concentrate on the spheres of activities allotted to them. A statement showing the functions of the three bodies is given in Appendix II.

33. *Whatever the merits of having three separate bodies to deal with the survey and exploratory working in respect of various minerals in the country, it is very desirable that there should be adequate co-ordination among them so as to avoid overlapping and duplication in their activities.* The Committee were informed that for this purpose at present two-monthly meetings are held wherein heads of these three organisations participate. *They feel, however, that the present arrangement of holding two-monthly meetings is not adequate to ensure co-ordination and that liaison Committees at various levels and in various spheres should be constituted for the three organisations, which should meet at regular intervals and ensure that the plans drawn up by the respective organisations do not overlap those of others or involve duplication of work, personnel, purchases, etc. during the same year or over a period of years.*

III

FINANCE & ACCOUNTS

A. Indo-Stanvac Petroleum Project

34. The first item of expenditure under the First Five Year Plan for oil exploration in the country was incurred in December 1953, when an agreement was signed with the Stanvac for joint exploration in the West Bengal Basin with 25 per cent. Government participation in the expenditure upto a limit of Rs. 2½ crores. The year-wise progress of Government expenditure under this project has so far been as follows:—

Year	Govt. Share
1954-55	Rs. 7,65,375
1955-56	Rs. 29,84,461
1956-57	Rs. 30,36,000
1957-58	Rs. 50,87,000
TOTAL	Rs. 118,72,836

B. Expenditure on Exploration

35. Oil exploration in the public sector was first taken up by the Oil & Natural Gas Directorate in 1955-56. The expenditure incurred in that year, however, was insignificant and amounted only to Rs. 75,187. In the Second Five Year Plan, a sum of Rs. 11.5 crores was allocated for this purpose. Later, a revised scheme, which envisaged an expenditure of Rs. 30.54 crores with a foreign exchange quantum of Rs. 12.81 crores during the five year period, based on the recommendation of the Soviet oil experts was drawn up. This envisaged a total expenditure of Rs. 13.13 crores for the first two years ending 1957-58 (Rs. 4.92 crores in 1956-57 and Rs. 8.21 crores in 1957-58). However, the programme for the first two years was later modified so as to reduce the financial outlay to Rs. 8.72 crores spread over as under:—

(figures in rupees crores).

	1956-57	1957-58
Revenue	·59	3·25
Capital	·77	3·30
Total of revenue & capital	1·36	6·55
Civil Works	·19	·62
GRAND TOTAL	1·55	7·17

C. Progress and Trends in Expenditure

36. The actual expenditure incurred by the Oil & Natural Gas Commission in 1956-57 and the latest estimates of expenditure for 1957-58 classified by broad categories are as follows:—

(Rupees in lakhs)

	Actuals 1956-57	Revised estimates 1957-58	Budget estimates 1958-59
Pay of Officers	1·72	8·56	13·91
Pay of establishment	3·73	7·24	18·99
Allowances & honoraria	3·05	10·00	27·75
Other charges	12·69	75·70	149·35
Charges in England	..	·84	7·31
Lumpsum Provision for additional dearness allowance	..	..	1·04
Revenue Expenditure	21·19	102·34	218·35
Capital Expenditure	52·28	123·34	165·00
Civil works	6·20	..	1·70
TOTAL EXPENDITURE	79·67	225·68	385·05

Thus, in the second year of its establishment, the ONGC has incurred expenditure three times of that in the first year while in the third year it would be five times. The major portion of the expenditure is accounted for by capital expenditure, consisting of the purchase of various types of equipment, etc. Another important portion is accounted for by "other charges" which include foreign personnel and operational costs. This item has increased six-fold in the year 1957-58 and is expected to increase twelve-folds in 1958-59. The five times and eight-fold increase under pay of officers and two-fold and five-fold increase under pay of establishment in these two years respectively, show that the staff of the O.N.G.C. is increasing at a very high rate. The Committee will have occasion to refer to these increases in the chapter on Personnel.

37. *It is observed that the total actual expenditure incurred by the O.N.G.C. in the first two years of the Second Plan period has been Rs. 3 crores as against Rs. 13.13 crores, later reduced to Rs. 8.7 crores, envisaged for this period in the scheme costing Rs. 30.54 crores drawn up for the full Second Plan period.* Of the total expenditure of Rs. 3 crores during these years, the expenditure on surveys

and drilling including pay and allowances, depreciation, construction works, etc. was as follows:

(Rupees in lakhs)

	Actuals 1956-57	Estimates 1957-58
Surveys :		
Aeromagnetic	1·25	1·58
Geological	5·34	20·30
Geophysical	7·23	50·82
TOTAL	13·82	72·70
DRILLING	25·08	69·58
TOTAL	38·90 (49% of total expenditure)	142·28 (63% of total expenditure)

Thus, the total expenditure on operational work has so far been Rs. 1.8 crores as against Rs. 8.5 crores recommended by the Soviet Oil Experts for the two years. While the Committee observe a welcome trend in the rising proportion of expenditure on surveys and drilling to the total expenditure, they feel that there is scope for intensifying the work and increasing the proportion especially in the future years. Further, while they also welcome the increasing expenditure on surveys and drilling, they wonder whether at the present rate of expenditure and progress, there is any reasonable prospect of fulfilling the targets within the plan period. It is, therefore, necessary that the O.N.G.C. should give highest priority to the drawing up of comprehensive plans to fulfil the plan targets, both monetarily and physically, during the rest of the plan period.

D. Future Requirements of Funds

38. As stated earlier, the original Second Five-Year Plan contemplated an expenditure of Rs. 11.5 crores for exploration, etc. of oil. This plan was later revised to the one costing Rs. 30.5 crores. It has been estimated by a non-official that the total expenditure required to mobilise the indigenous oil resources may be of the order of Rs. 1,500 crores until 1976 on exploration and production at the rate of Rs. 40 crores per annum until 1966, rising to Rs. 85 crores and Rs. 150 crores per annum during the subsequent plan periods. These are very large amounts and it may strain the country's capacity to bear such expenditure. However, as against this expenditure, the expenditure incurred by the country on imports of oil has to be considered, since the total imports of crude oil and petroleum products into the country were valued at Rs. 65 crores and Rs. 80 crores in 1955 and 1956 respectively. These are likely to rise further to over Rs. 100 crores in the next few years though they might slightly diminish when the Nahorkatiya crude starts flowing out. *Considering the extent of imports, the country has to strive to leave no stone unturned in its attempts to explore every possible source for oil in*

the country. One of the main difficulties in doing so is likely to be how to find the finance required for the purpose. This is likely to be so even after giving a corporate status to the Oil & Natural Gas Commission since it would have no source of revenue. *The Committee would suggest in this connection that the feasibility of setting up an Oil Development Fund by levying a cess on petroleum products or converting a part of an existing excise duty into a cess and of assigning it to the Commission might be considered. The feasibility of obtaining loans from the World Bank or other U.N. agencies or other sources for developing the oil resources in the public sector might also be considered.*

E. Comparison of Operational Costs

39. The following table gives the comparative costs as furnished by the Ministry of Steel, Mines & Fuel of the various survey parties and of drilling undertaken by the O.N.G.C. in India and those in Canada. It also includes figures furnished by the S.V.O.C.

	ONGC	Indo-Stanvac	Canada
1. Gravity-*cum*-Magnetic Party	Rs. 14,000 P.M.	80,000	$5,500 P.M. (Rs. 31,000).
2. Seismic Party average	Rs. 50,000 P.M.	3,25,000	$27,000 P.M. (Rs. 1,23,000).
In difficult areas	Rs. 1,15,000 P.M.	..	$40,000 P.M. (Rs. 1,90,000).
3. Geological Party .	Rs. 14,500 P.M.	35,000	
4. Deep Drilling (10,000)	Rs. 500* per ft. at Jawalamukhi	Rs. 588 - per ft.	Average $22·5 (Rs. 107) per ft and $40 (Rs. 190) per ft. in mountaineous areas.

The Assam Oil Company is stated to have estimated the cost of a seismic party at over Rs. 11,000 a day.

40. *It has thus been represented to the Committee that the unit cost of operation in the O.N.G.C. is very low as compared to that in Canada, so far as exploration is concerned. The Committee feel that such an empirical deduction would not be correct in the absence of full comparative details such as size of party, quantitative and qualitative, output per individual in terms of area surveyed, etc. for the various organisations referred to above.* They also understand

*This figure is based on the cost of drilling of about 5,000 ft. only whereas the Canadian average is based on millions of ft. of drilling. For getting a true picture in India the data from at least a few hundred bore holes will be needed

that costs of O.N.G.C. shown in the above table do not include various overheads such as administrative charges at headquarters and Branch Offices, Civil works expenditure etc. *The Committee would suggest that a fair comparison should be attempted by the O.N.G.C. and the Committee apprised of it in due course.*

41. In connection with the comparison of cost recommended above the Committee would invite attention to the following statement furnished to them:—

> "When the detailed financial implications of the Soviet experts' proposals were worked out by the O.N.G.C., it was found that the total expenditure during the five year period would exceed the figure of Rs. 30·7 crores arrived at by the Soviet experts (the basis on which the Soviet experts had worked out the costs were not understood fully)."

The Committee feel that this clearly leads one to conclude that the costs of exploration according to O.N.G.C. standards are higher than the Soviet experts standards, which would indicate that there is scope for reducing the costs of exploration in India by O.N.G.C. They, therefore, hope that as a result of the review suggested by them, it would be possible to reduce the exploration costs in India.

F. Comparison of Estimates and Actuals

42. The following table gives the budget figures under each sub-head of the estimates of the ONGC during 1956-57, 1957-58 and 1958-59.

(Figures in Rupees Lakhs)

S. No.	Sub-heads	Budget Grant 1956-57	Revised estimates 1956-57	Actual expenditure 1956-57	Saving	Budget Grant 1957-58	Revised estimates 1957-58	Saving	Budget Grant 1958-59
I.	*Revenue Expenditure*								
	A. 1 Pay of officers . .	2·10	1·86	1·72	·38	14·86	8·56	6·30	13·91
	A. 2 Pay of Establishment .	3·27	3·74	3·73	(—)·46	19·41	7·24	12·17	18·99
	A. 3 Allowances & Honoraria	4·41	3·02	3·05	1·36	24·60	10·00	14·60	27·75
	A. 4 Other charges . .	49·05	26·90	12·69	36·36	1,98·50	75·70	1,22·80	1,49·35
	B. Lump provision for additional dearness allowances.	..	..	..	..	..	..	..	1·04
	C. Charges in England .	..	..	..	..	0·30	0·84	(—)·54	7·31
	TOTAL . . .	58·83	35·52	21·19	37·64	2,57·67	1,02·34	1,55·33	2,18·35
II.	*Capital Expenditure* . .	86·17	71·35	52·28	33·89	2,00·00	1,23 34	76·66	1,65·00
III.	*Civil Works* . . .	10·00	8·00	6·20	3·8	3·00	..	3·00	1·70
	GRAND TOTAL .	1,55·00	1,14·87	79·67	75·33	4,60·67	2,25·68	2,34·99	3,85·05
					i.e... 48% of budget grant			*i.e.*, 51% of budget grant	

43. *It is thus seen that during the last two years i.e., the first two years of the Second Plan the actual expenditure of the ONGC has consistently fallen short of the budget estimates, the difference being Rs. 75 lakhs in* 1956-57. *The figures of actual expenditure for* 1957-58 *are not available but the revised estimate is less than the budget estimates by Rs.* 2.35 *crores.* Further, the variation between the revised estimates and the actuals of 1956-57 creates a serious doubt as to how the actual expenditure in 1957-58 will compare with the revised estimate. It would also be observed that the variations are particularly heavy under capital expenditure and other charges which include a wide variety of expenditure but are also quite substantial even under an item of expenditure like pay of officers and establishment. The shortfall in expenditure during 1956-57 was explained as due to delay in recruitment of staff, delays in availability of drilling equipment, non-submission of bills of Techno-Experts from the U.S.S.R., non-adjustment of book debits for works already completed by C.P.W.D. etc. The shortfall in expenditure during 1957-58 has been stated to be due to reduction in drilling programme, actual savings, *e.g.*, the cost of equipment being less than was estimated, reduction in the number of vehicles allotted to exploration parties, and reduction in the number of foreign experts, etc. *The Committee are not satisfied that these reasons are an adequate justification for the variations and the shortfalls. They feel that these reveal not only poor budgeting but what is much more serious, poor planning without reference to the availability of resources, personnel, equipment, etc. on the part of an important organisation like the ONGC. These are not matters which will be automatically solved when the ONGC is given autonomous status, as recommended elsewhere. The Committee recommend that these matters should be given topmost attention and every attempt made to improve budgeting as well to draw up realistic plans.*

G. System of Accounts

44. *The Committee feel that one of the reasons for defective budgeting and planning might be the system of accounts followed by the ONGC which is the same as in the case of any Government Department. They considered that the ONGC should maintain accounts in a commercial form like any exploration and mining concern and that they should be available for scrutiny in that form.* They were informed that this would be examined when the Commission was given a corporate status. The Committee fail to understand why the system of accounts should be linked up with the status of the concern when it is desirable to maintain accounts in a particular form. There are many organisations within the Government Departments which in view of the commercial nature of their activities maintain commercial accounts at least in a *pro forma* manner. ***The Committee recommend that the Commission should take immediate steps to draw up and maintain commercial accounts of its expenditure.***

45. *The Committee further recommend that ONGC should develop statistical and analytical techniques for the purpose of realistic budgeting at least insofar as operational expenditure is concerned, instead of basing it merely on certain items of expenditure like wages, stores charges, etc.* They feel that an organisation like the ONGC having a number of field offices, where generally similar activities are conducted at more than one location and administered by different organisational units, budgeting as well as the control of expenditure can be greatly facilitated by a careful analysis and computation of average cost per activity or cost per unit of work so as to enable a proper correlation of expenditure and achievements to be made, and also to ensure that expenditure is being incurred economically and efficiently. This in turn would need an efficient Cost Accounts Organisation. While the Committee understand that a small statistical section has been set up at the headquarters of the Commission and that one of its functions is to analyse the cost performance data of the ONGC field and drilling parties, *they feel that the entire organisation and the system should as early as possible be put on a more satisfactory footing in consultation with the C.C.A.O. of the Government of India as well as other cost accounts experts. The Committee recommend that the ONGC should give early attention to all these requirements.*

46. *The Committee further recommend that simultaneously with the setting up of a Cost Accounts Organisation, action should be taken to set up an internal audit organisation to conduct a continuous audit of transactions and payments particularly at the outstations.*

H. Proposals for Economies

47. As a result of the economy measures initiated in 1957 the following economies were stated to have been effected:—

(i) Saving of about Rs. 120 lakhs effected in the original budgeted expenditure of Rs. 461 lakhs.

(ii) A saving of Rs. 45,821 effected during August to November 1957 (Rs. 43,805 due to posts kept unfilled vacant and Rs. 2,016 saving in contingencies).

48. The Committee understand that these amounts even if made available to the ONGC might not have been spent due to organisational and other shortcomings. They consider it unfortunate that expenditure which could not be incurred should be shown as economies. *However, it may be stated that the Committee have pointed out elsewhere that there is scope for further savings in various directions, particularly in the expenditure and staffing of Delhi and Calcutta Branch offices, the two of which cost over 10% of the total charges of pay of officers and establishment of the ONGC as also in the proposed increases in the Ministry. The Committee recommend that early action to effect these economies so as to secure better use for them should be taken.*

IV

EXPLORATION AND PROSPECTING

A. Oil Consumption in India

49. The Thacker Committee on 'Requirements and Utilisation of Coal' assessed that the total energy consumption of India in 1956 was 225 m. tons (coal equivalent) of which commercial energy accounted for only 20 per cent. Of the remaining 55 per cent or 100 m. tons of coal equivalent were consumed in the form of animal dung, wood charcoal etc., while 45 per cent or 76 million tons (coal equivalent) were accounted for by animate effort. Of the commercial energy, oil met approximately 12 per cent of the country's requirement, coal nearly 83% and hydro-electric power approximately 5 per cent. It is a matter for concern that 100 million tons (coal equivalent) of energy should be accounted for by wood charcoal and dung, since it involves deforestation and waste of good quality manure, which in turn leads to impoverishment of the soil. It is, therefore, evident that the country has to quickly change the pattern of energy utilisation in the interest of the national economy.

50. On a conservative estimate the Thacker Committee (assuming a 10 per cent compound increase in utilisation of commercial energy) assessed the total commercial energy requirements at 396 million tons (coal equivalent) by 1975, of which only 17 per cent would be met from oil from natural or synthetic sources—11 per cent by natural oil produced at home or imported, and 6 per cent from synthetic oil. On this basis, the total natural oil requirements of the country by 1975 would be of the order of 40 million tons which on a conservative estimate would cost over Rs. 400 crores.

51. The present production of mineral oil in India *viz.*, at Digboi amounts to 8 per cent of the present annual requirements of 5 million tons. Full exploitation of Nahorkatiya oil fields would add another 2½ million tons of crude in 1960 meeting another 40 per cent of the country's requirements of 6·6 million tons. Thus the balance of over 50 per cent would remain to be met.

52. On the present basis the following would be the anticipated imports of crude and petroleum products for the period 1958—61:

[The imports of previous 3 years have also been given]

Year	Value in Rs. (crores) at an average of Rs. 200 per ton.
1955	85
1956	81
1957	90
1958	108
1959	118
1960	130
1961	142

The magnitude of the imports of oil required in the economic expansion of the country as well as the foreign exchange required for the purpose would clearly indicate the importance and urgency of making determined attempts to find oil and gas in the country as sources of energy, since the alternative is to slow down the proposed rate of industrial progress.

B. Extent of exploration

53. The search for oil is now considered to be a 'game of calculated venture based on modern science and efficiency'. But with all the modern techniques of surface exploration such as aeromagnetic, geological and geophysical surveys, oil technologists cannot determine where an oil field may be, without tapping the structure deep down the earth with a well. The element of risk involved in such drilling is evident from the fact that in a country like the U.S.A., one drill hole amongst ten put in an area not drilled before may yield oil; one out of 44 wells drilled finds oil which is enough to supply the U.S.A.'s. requirements just for four hours while the odds against finding a 50 million barrel field are 991 to 1.

The difficulties in regard to exploration are particularly bad in this country where underground conditions over vast areas of the Ganga valley, West Bengal, Rajasthan, Punjab and U.P., lower Himalayas, Cambay and even Assam are not known so far to geologists. Inadequacy of authentic geological and geophysical data regarding oil-bearing areas is highlighted by the fact commented upon by the Soviet oil experts that in 1956 only 6!% of the Indian territory had been covered by geological survey out of which only one-third had been covered by detailed mapping used in oil prospecting while the extent of the study of potentially oil-bearing areas covered hardly 17,126 sq. miles out of 370,000 sq. miles which works out to only 4·2 per cent.

54. In spite of the position described above, the Soviet oil experts pointed out that no country had postponed oil and gas exploration till the definite results of the preliminary investigations were avail-

able. However, they warned that it was necessary to give priority in the following years *i.e.*, 1956–61 to the most detailed geological and geophysical investigations.

55. The principal exploration work in the First Five Year Plan was done under the Indo-Stanvac Petroleum project in which there is government participation also and by the A.O.C. in the areas leased out to it for exploration and prospecting. The contribution by the governmental agencies in the exploration of oil-bearing areas was very little. The Committee consider it unfortunate that this important item of work was not given sufficient importance in the First Plan.

C. Strength of exploration parties

56. In 1955-56 when the Soviet oil experts visited India, the number of exploration parties working under governmental agencies were only 7 being as follows:

Geological parties	..	3
Gravity & magnetic parties	..	3
Seismic party	..	1

It was pointed out by the experts that unless the number of parties was increased, it might take anything from 50–165 years to complete the survey of the entire area before any drilling could be attempted. *They also pointed out that it was necessary for the parties to raise their existing rate of output. The Committee consider this latter recommendation as particularly of importance and recommend the need for such a review with reference to the standards in other countries as has already been suggested in paragraph* 40.

57. As a result of these recommendations coupled with the importance given in the Second Plan to the work of exploration and development of the country's oil resources, additional survey parties were sanctioned. Thus, the number of parties at present as compared to those recommended by the Soviet experts are as under:—

Categories of exploration parties	No. of parties at present under the Oil & Natural Gas Commission	No. of parties as recommended by the Soviet experts
Geological	15	14
Gravity-*cum*-Magnetic	8	14
Seismic	6	10
Bieetio ogging	2	3
Structura drilling	4	*8
Deep drilling	2	5
Gas 'oggi ng	3	6
Topo-geoxetical parties	..	3

*Including shallow drilling and reference drilling.

D. Recommendations of Soviet Oil Experts

58. The Soviet oil experts considered the claims of the following potentially oil bearing areas in the country while making their recommendations, but not Assam and West Bengal areas, where the A.O.C. and S.V.O.C. were operating: (i) Punjab with Himachal Pradesh and Jammu and Kashmir, (ii) Rajasthan, (iii) Cambay-Cutch, (iv) Ganga valley, (v) South West-Bengal, (vi) Andhra Coast, (vii) Travancore Coast, (viii) Tripura, (ix) Andamans. The experts considered (not taking into account Assam) Punjab, Rajasthan, Cambay and West Bengal as very promising areas for exploration. While Punjab was believed to be the most promising area, it was thought that Ganga valley might turn out to be one of the biggest sedimentary basins. It was considered essential, however, that geophysical reconnaissance and structural drilling in this area should be accelerated. The tasks for the five year period 1956–61 were summed up as follows:

(i) To concentrate attention on Punjab and Rajasthan (Jaisalmer) since they were the most studied and prospects there were encouraging.

(ii) To carry out geological and geophysical investigations as well as drilling to a small extent in the Ganga valley, Cambay area and Madras coast.

(iii) To cover by geological mapping 11,000 sq. miles by gravity and magnetic surveys, 1,63,000 sq. miles, by seismic survey 16 areas to the extent of 16,000 miles and by core drilling 13 areas for deep test; with 145 wells with a footage of 5,15,000 ft.

(iv) To investigate by deep drilling 5 areas in Punjab (Jwalamukhi, Bahl, Nana, Dharmshala and Janauri) as well as in Jaisalmer (Bandha and Tanot) and to start deep test drilling in Ganga Valley, West Bengal and plains of Punjab, making in all 44 wells with a footage of 5,00,000 ft.

The targets recommended were, however, slightly reduced especially in the first two years partly because of financial difficulties and partly because of personnel difficulties.

E. Progress in exploration

59. The following table shows the extent of the main sedimentary areas in the country with potentialities for oil and gas, the area surveyed or mapped until 1956, the area recommended by Soviet oil experts for survey in 1956-57 and that actually surveyed in that period.

S.No.	Approximate area in square miles	Photographic survey			Aeromagnetic survey			Geological survey			Gravity survey			Seismic survey		
		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
1. The region of Assam including Manipur	20,000+	..	..	..	..	..	..	covered by concessions referred to in para 56.								
2. Travancore-Coast	6,000	..	..	..	..	..	..	1,200	..	..	..	..	..	..	..	..
3. The West Bengal basin (including parts of coastal Orissa and Sundarbans)	30,000*	..	..	..	..	..	..	covered by concessions referred to in para 56.								
4. Punjab (including Himachal Pradesh) and Jammu & Kashmir	50,000	..	4020	..	14,400	..	..	7,700	640	†549	.. (Russian party)	11,000 line miles	1,165	..	700 (Russian party)	230
5. Rajasthan	46,500	..	..	..	17,000	8,100	..	3,100	450	100	800	4,000	1,170	..	600 line miles.	..
6. Cambay-Cutch	68,500	..	..	..	..	..	..	3,950	exact are not given	275	**11,200	4,000	2,136	14	300	..
7. Ganga valley	1,42,000	..	..	..	1,50,000	9,735 linear miles	..	1,750	to be worked out	..	..	7,200	..	..	360	..
8. Madras Coast	17,000	..	..	..	..	..	..	6,500	..	..	255	..	..	..	..	..
9. Andhra Coast	9,500	..	..	..	..	..	..	1,700 & 300	..	..	..	..	..	..	..	..
10. Tripura	10,000	..	..	..	..	..	..		..	..	..	..	..	..	..	..
11. Andaman Islands	3,000	..	..	..	..	..	..	2,000	..	..	..	..	..	..	..	..
	4,02,500	..	4020	..	1,81,400	17,835	..	28,200	1,090	924	12,255	26,200	4,471	14	1,960	230

1. Upto 55-56.
2. Recommended by Soviet Oil Experts for 55-57.
3. Actuals.

+including AOC concession areas.
*Including 10,000 sq. miles SVOC concession ar

**Traversing 24·5 line miles.
†Traversing 468 line miles.

60. *Punjab area.*—This is the area where the O.N.G.C. has concentrated the major portion of its efforts in exploration work and over 50% of its expenditure has been incurred in this area where 8 geological, 2 gravity and 2 seismic parties are operating. A drilling party is in charge of the drilling work. However, the above table shows that the actual work has fallen short of the targets recommended by the Soviet experts.

61. This area was considered as offering first rate prospects of finding oil by the Soviet oil experts and Dr. Levorsen. On the advice of the former drilling was undertaken with effect from 1-4-57. As against the four wells with a footage of 26,000 ft. recommended by Soviet experts the progress since 1-4-57 to date has been 6,000 ft. odd only involving an expenditure of about Rs. 30 lakhs. On an average drilling was only 15 ft. to 20 ft. a day. The slow progress was attributed to the nature of the strata in which very hard sandstones alternate with sticky clays. To accelerate the rate of drilling, it was decided to introduce a process known as turbodrilling four months after the commencement. The progress has, however, continued to be halting due to several accidents such as breaking of the roller-bit with support in August, 1957, and the jamming of the drilling towards the end of January, 1958, as a result of which operations had to be suspended for several days. The infructuous expenditure as a result of the stoppages alone is reported to be over Rs. 3 lakhs so far.

62. In this connection, conflicting views regarding oil potentialities of this area have, however, been expressed. On the one hand it has been brought to the notice of the Committee by an eminent geologist that: "it would appear that the team which located the site for drilling completely ignored the nature of the rocks which have to be drilled through. It should have been obvious to any experienced geologist that the Siwalik sandstones at the site are very much harder than the ordinary tertiary strata through which drilling is done in Assam. The slow progress may also possibly be due to the type of drilling equipment which is used at Jwalamukhi." Another eminent geologist informed the Committee that "it is unfortunate that initial exploratory work by the O.N.G.C. is confined to Jwalamukhi where drilling conditions are very difficult". On the other hand the Soviet oil experts and the American Petroleum Geologist Dr. Levorsen considered this area as one which offered good prospects for oil. There were other encouraging factors such as the gas seepage at the Jwalamukhi Temple, proximity to the West Punjab Oil belt etc.

63. The Committee were informed that there were fair prospects on present indications of finding oil in this area and that if the present well did not reveal oil, another well would be drilled in the neighbouring area.

64. *Cambay area.*—The occurrence of natural gas in this area was first noticed by private individuals some 25 years back. The area was surveyed by the G.S.I. and later some geophysical investigations were also carried out in 1948-49, 1950-51, 1952-53 and 1955, 1956-57. It

was recommended for further exploration by the Soviet experts as well as others. Two geologists and three Gravity parties were operating in this area. The table given earlier shows that the actual work has fallen short of the targets recommended. The expenditure so far has been about Rs. 25 lakhs. The Soviet experts also recommended drilling of six wells with a footage of 20,000 ft. This has so far not been undertaken. However, plans have now been drawn up to undertake drilling in this area but the actual work would await rescrutiny of seismic data already collected so as to pinpoint the drilling site. A drill is also proposed to be sent to the Gogha area. *The Committee recommend that the implementation of the decisions taken in these cases should be expedited so as to prevent further waste of time.*

65. *Other areas.*—Jaisalmer in Rajasthan had been recommended as a promising area, especially if there was a geological line-up, between this area and the oil fields in Pakistan, particularly in Baluchistan. In 1955, the Geological Survey of India had drawn up a five year proposal costing Rs. 4½ crores, spread over 3 phases for this area. This was modified later in the light of the Soviet experts' recommendations. Geological, aeromagnetic, and gravity surveys were carried out as a result, but the progress has been short of the targets. No seismic survey was carried out as recommended by Soviet experts. The expenditure so far has been over Rs. 10 lakhs in the last two years. Two geological, one gravity and one seismic party are operating in this area.

66. It is seen from the statement given earlier that so far not much work has been undertaken in the Ganga Valley though it was recommended by the various experts. The Committee have been informed that two Seismic parties are conducting investigations in Ganga Valley since November, 1957 and some results have also been obtained. Details are lacking. In this connection, *the Committee would point out the views of an eminent geologist that this area is potentially oil-bearing and that if oil is found in this area it would be in quantities which would be commercially profitable. The Committee suggest that this view may be given due consideration.*

67. In Assam, a private company, *viz.*, the A.O.C. is operating at present. The largest and the most detailed survey and mapping in the country are reported to have been done by the company in this area in the last 6 years. Recently, Government have also decided to enter this area. One Seismic party has been allotted to it. The work so far done, however, is not significant. Certain licences for exploration with Government participation have also been given. Apart from the oil field at Digboi, recently oil has also been struck at Nahorkativa and Moran in commercial quantities. *In view of these various encouraging factors, the Committee recommend that Government with or without association of A.O.C. should attempt at greater exploration for oil in this area than has been the position so far.*

68. In West Bengal the S.V.O.C. and Government are operating in a joint venture over an area of 10,000 sq. miles. So far the attempts at drilling have not been successful and two wells have been abandoned. The Committee understand that the S.V.O.C. experts are very optimistic of finding oil. *The Committee also understand that West Bengal was considered a promising area by the Soviet and other experts. They therefore hope that these views would be taken into account in determining the exploration policy for future and that measures would be taken to explore the oil potentialities of this region.*

F. Suggestions for future exploration

69. *It is evident from the foregoing that the progress in regard to the survey and exploration of even the potentially oil-bearing areas in the country has been very tardy and has fallen far short of the targets recommended by the Soviet oil experts.* The Committee realise that the attempts for exploration of oil had to start almost from a scratch with insufficient geological data, equipment and experienced personnel. While appreciating the pioneering effort that has been made in the last two or three years in making bold plans for the future in training freshers from the universities and in undertaking different types of investigation of a highly specialised nature, the Committee nevertheless consider the slow progress as unfortunate, particularly in view of the importance of finding oil, of making explorations for the purpose and of the vast ground that still remains to be covered. *They, therefore, recommend that the O.N.G.C. should give special attention towards preparing and executing a dynamic programme for the surveys, mapping and exploration of potential oil-bearing areas in the country, in as short a period as possible.* The programme should take cognizance of the need to give priority to those areas where greater exploration has been done or where if oil is found it will be in commercial quantities. Further, while in implementing the programme the existing survey parties should be worked more intensively and extensively than hitherto with particular reference to the review suggested in para 39, the full cooperation of the older institution of G.S.I. in respect of personnel, equipment, etc. should also be secured in the search for oil. The expansion of and increase in the number of parties should also be given attention. As regards the resources for the purpose, the Committee have already recommended certain measures in para 38.

70. Besides the measures suggested above, *the Committee would recommend that the cooperation of the private sector may also be obtained in the task of the exploration of oil within the framework of the Industrial Policy Resolution of 30th April, 1956 under which the expansion of the existing privately-owned units or the possibility of the State securing the cooperation of private enterprise in the establishment of new units when the national interests so require is not excluded and the State has to ensure in such cases either through majority participation in the capital or otherwise, that it has requisite powers to guide the policy and control the operation of the undertakings.*

G. Licences and Leases

71. The grant of oil exploration, prospecting, etc. licences is governed by the Mines & Minerals (Regulation and Development) Act, 1948, and the Petroleum Concession Rules, 1949. The Committee were informed that under these rules in the last 10 years, three exploration licences, 23 prospecting licences, of which 18 had since expired, and 2 mining licences had been granted by Government. Of these in the case of three prospecting licences and one mining lease given to the A.O.C. in Assam, certain conditions were also imposed, mainly with a view to facilitating Governmental participation and/or control over future operations.

72. The Committee understand that applications made by oil concerns for licences or lease have not received attention at the hands of Government for long periods and that several applications made by them were pending with Government. *In this connection, they were informed by the Ministry that the rules mentioned in the foregoing para were being revised so as to bring them in line with the Industrial Policy Resolution and that pending this revision, it was decided by Government in January, 1955, not to grant any fresh petroleum concessions. The Committee regret to observe that the Petroleum Concession Rules which were then under revision and consideration have not still been finalised. The policy not to grant licences has thus been in force for nearly 3½ years and what is more, none of the oil concerns seems to be aware of it. The Committee feel that the question of exploration and prospecting and even mining of oil has to be viewed from practical considerations and expediency. As pointed out elsewhere, at present the resources and know-how of the O.N.G.C. are limited and not all its personnel are sufficiently experienced. A liberal policy should, therefore, be adopted in this matter as has in fact been done in several other countries. While direct exploration etc. by Governmental Agencies should continue and in fact should steadily expand, for some years to come, private concerns should to the extent possible be given licences to undertake exploration work, with or without Government participation, depending on the availability of resources, subject, of course to the requirement of the Industrial Policy Resolution. Further, the policy should be flexible to suit each case but not one of vacillation or of inaction. The Committee recommend that early decisions should be taken in all these matters and that they should be announced to prevent any misapprehension in any quarters.*

73. Even in regard to the exploration and prospecting work to be undertaken by Government, the Committee would suggest that instead of undertaking it directly by a governmental agency in all cases, it might be advantageous to employ some contractors, particularly for drilling work, who, they understand, have done such work in a number of countries and even in India are doing so for the S.V.O.C. and A.O.C. *The Committee feel that the employment of a number of such agencies would hasten the work and also enable proper comparison to be*

made of the expenditure incurred by different agencies so as to control and economise the cost.

H. Petroleum Laws

74. As regards the various petroleum concession and other laws in the country, it is observed that at present there are at least four different Acts and Rules which regulate the oil industry, *e.g.*, Petroleum Act, 1934, Mines and Minerals (Regulation and Development) Act, 1948, Petroleum Concession Rules, 1949, Mines Act, 1952, etc. Each of them was intended to serve a specific purpose which became expedient at the time it was framed with the result that there is no composite law governing the industry. It has been mentioned earlier that the present laws are under revision and consideration of Government. Even then, the intention is to have two sets of rules, *viz.*, Petroleum and Natural Gas (Leases and Licences) Rules and the Petroleum and Natural Gas (Regulation and Development) Rules. The Committee understand that considerable study into the laws in various countries has been made before the drafting of these rules was undertaken. They learn, however, that the position in this respect in some of the major oil-bearing areas particularly in the Middle East has been changing considerably in the last few years. *The Committee recommend that the rules should take cognizance of all these changing patterns abroad as well as of the liberalized policies recommended earlier and that they should be such as would make possible a flexible, rather than any rigid, approach. While making provisions for payments of royalties, taxes, etc., the rules might also provide for the rendering of all information to Government and the supervision over the activities to ensure that the areas are investigated intensively and that there is no waste of resources. Finally, the Committee recommend that the issue of these revised rules pending for the last three or more years should be expedited.*

I. Arrangements for checking data

75. The procedure hitherto followed by the O.N.G.C. in regard to the scrutiny and checking of the various types of data collected during exploration, etc.. is as follows:—

"a. Aeromagnetic survey results furnished by the Canadian team for the Rajasthan and Indo-Gangetic plains. Independent review computations and interpretation were carried out by the Geophysics Directorate of the Commission.

b. Gravity Survey carried out by the Soviet team in Punjab. A test profile was run with an American instrument by the Commission's Geophysicists across the main features suggested by the Soviet survey, to check up the data. Computations were also carried out independently.

c. The seismic data obtained by the G.S.I. in Cambay area is being recomputed and checked independently by the Soviet team and a batch of Geophysicists of the Commission."

In addition, geological and geophysical data were also stated to have been shown at times to certain foreign experts during their visits to India.

The Committee were informed that the Commission themselves were not satisfied in regard to the present arrangements for getting the data checked. They consider that this is an important aspect of oil exploration and active steps should be taken to train staff for this purpose and to give them the necessary experience under experts. Further, they understand that oil companies in India and abroad have often found it necessary and advantageous to invite outside consultants for alternative interpretations of the survey data. *They suggest that the data collected by ONGC may also be got examined on a regular basis by independent foreign as well as Indian experts. For this purpose, they would suggest that the feasibility of setting up a panel of such consultants and/or a technical advisory committee of independent experts might be examined.*

V

PRODUCTION AND REFINING

A. Present production

76. The oldest oil production unit in the country is located at the oil fields at Digboi (Upper Assam). Even today these are the only oil fields in India which are actually being exploited. A refinery was established at Digboi in 1920 with an all indigenous crude oil intake of 0·35 million tons per year, and meets about 8% of the coumtry's requirements. It produces a number of petroleum products including kerosene (both superior and inferior categories), diesel oil, high speed diesel oil, motor spirit, etc.

In December, 1951 agreements were signed by the Government of India with the Standard Vacuum and the Burmah-Shell group of companies whereby they agreed to set up a modern refinery each in Trombay near Bombay. This was followed by an agreement with Caltex on the 28th March, 1953, for setting up a refinery in Visakhapatnam on the east coast. The three refineries went on stream in late 1954, in 1955 and in April, 1957 respectively. Their aggregate capacity is about 4·37 million tons of petroleum products per annum as against India's current requirements of just over 5 million tons, Burmah-Shell, Stanvac and Caltex each accounting for 2:3, 1:4 and 0·67 million tons respectively. As a result of discovery of oil at Nahorkatiya, two refineries are likely to be set up shortly. Their estimated capacity would be about 2 million tons.

The requirements of petroleum products are believed to be increasing at the rate of 10% annually, but in view of the considerations pointed out in para 52 the actual demand might well be considerably more. Further the extent of imports during the period 1955-60 would be Rs. 314 crores for crude and Rs. 315 crores for other products. It is evident, therefore, that the problem of meeting the demand (besides that of finding the crude) is urgent and has to be continuously faced.

77. *Formation of Oil India (P.) Ltd.*—During the exploration and prospecting by the A.O.C. in Assam, oil was struck in commercial quantities in 1953, the reserves being estimated to produce annually 2½ million tons. However, it was only in the beginning of 1958, after protracted negotiations that an agreement was signed with the A.O.C. for the formation of a company known as Oil India (Private) Ltd., to exploit the oil reserves at Nahorkatiya. *The Committee consider it unfortunate that as a result of the delay in reaching an agreement for*

five years the country has had to import petroleum products of the value of about Rs. 40-50 crores a year which might have been manufactured with the Nahorkatiya crude, besides the royalty and other charges lost as a result of non-exploitation of the fields. It was explained that the protracted negotiations which preceded the agreement were due to the desire of the Government to get reasonable terms from the A.O.C. to exploit the reserves. *The Committee hope that the lessons learnt from these negotiations would be kept in view when similar negotiations are entered into in future.*

78. The agreement with the A.O.C. for the setting up of Oil India (P.) Ltd. provides for one-third investment by Government and two-third investment by A.O.C. The Burmah Oil Co. have agreed to advance a sterling loan to the extent of £ 10 million. The agreement also provides that the new company shall pay to and reimburse the A.O.C. all cost of or in connection with the surveys and explorations under the licence relating to the Nahorkatiya oil field, etc. and it is reported that the Assessment Committee consisting of 2 representatives each of the two parties has nearly completed its work in the field and is now busy in the final phase of deliberation. In addition, the A.O.C. will be entitled to receive from the Oil India (P.) Ltd., in each year 1/24th of oil and natural gas produced by the company on payment of production costs and royalty for the first million tons, 1/48th for the second million tons and 1/96th for the third million tons.

79. The Oil India (P.) Ltd. will undertake production of oil and will also arrange for the construction in two stages and operation of a pipeline for the transport of crude upto the refinery sites. The timings for the two stages are to be determined by Government. The International Petroleum consultants on the project for the 600 mile pipeline from the Nahorkatiya-Hugrijan area to the refinery sites are reported to have already submitted an interim report to the Government. The oil produced will be sold to two refineries sponsored by Government and to be established in the public sector. The delivered price is to be either the lowest delivered at Calcutta from or by any source or the cost to the company together with a fair return, whichever is lower, the price being fixed by company with the approval of Government after examination of costs and half-year review. Whether this is advantageous to the country or not, will depend upon what return will be considered fair.

80. *It would be observed that the agreement includes certain undesirable features.* However, it provides for the appointment of a Special Director on the Board of Directors. *The Committee hope that an energetic officer with suitable qualifications will be appointed at an early date to take proper care of the country's interests. They also hope that all the projects* (i.e., *production, transport of crude, refining, transport of refined products in respect of the Nahorkatiya oil fields, as also of Moran oil fields (where oil is reported to have been struck) will be executed expeditiously keeping in view the volume of imports which delays in production involve.*

81. *The Committee would suggest that the Government policy in regard to the distribution of petroleum products after the refineries in the public sector go into operation should also be determined at an early date to enable action to be initiated sufficiently early for its implementation.*

82. *Proposal for setting up refineries.*—The Committee understand that in the last few years, two proposals were received from Indian entrepreneurs, one from Madras and the other from Bhavnagar for establishing refineries in India. Of these, the former proposal was rejected by the Government as the proposal had 'several inherent draw-backs' while consideration of the latter has been kept pending for over two years partly because full details regarding Nahorkatiya crude were not available and partly because negotiations were going on with the AOC for its utilisation. Later in 1957, further discussions were held with the promoters who were advised that Government would consider on merits any scheme that might be put forward provided the location of the refinery and the pattern of production were in accordance with the requirements of the country and also provided, the project was backed by dependable and acceptable financial assistance. Since then, more details of the extent of oil reserves had become available and in the context of their utilisation, Government did not consider it worthwhile encouraging the establishment of any new refineries based on imported crude oil. The matter was stated to be still under consideration.

83. In regard to the proposal for setting up a refinery at Bhavnagar with a capacity of 1·2 million tons at a cost of Rs. 12 crores, the Committee understand that (1) it had the support of the then Government of Saurashtra who had agreed—

(a) to extend all possible facilities to the sponsors of the project including redesigning and developing port facilities to suit the requirements of the proposed oil refinery;

(b) to make available the necessary land for the location of the refinery as also the installation associated with the same;

(c) to make adequate provision for power plant and industrial water supply;

(2) assured supply of crude oil from the National Iranian Oil Company and the supply of oil tankers by the National Iranian Tanker Co. had been arranged;

(3) the sponsors were prepared to use Indian crude if and when available;

(4) supply of necessary equipment on deferred payment basis as well as facilities of Technical assistance by M/s. Krebs and Cie, Paris had been arranged;

(5) financial participation to the extent of Rs. 1 crore by the French Company M/s. Krebs & Cie, had been arranged;

(6) the overall control would be in Indian hands;

(7) the Government would be requested to appoint directors on the Board of Directors to control the working and price policy;

(8) it had been indicated that it was even prepared to be nationalised;

(9) its working would have meant an annual saving of foreign exchange to the extent of Rs. 6 crores;

(10) the refinery was intended to be kerosene-intensive with a kerosene production of 19·9% as against 14% at the SVOC and Burmah-Shell refineries and 18% at Caltex refinery.

In the light of the facts stated above, *the Committee suggest that the consideration of the proposal to set up a refinery in the private sector may be expedited keeping in view the provisions of the Industrial Policy Resolution.*

B. Pattern of Production

84. The following table gives the figures of anticipated imports of various types of petroleum products during the period 1957—62 indicating the difference between the demand and indigenous products:

(Rupees in lakhs)

	1957	1958	1959	1960	1961	1962
Aviation Spirit	350·9	353·6	336·9	336·9	329·8	329·4
Kerosene including A. T. F.	993·6	1998·7	2276·7	2563·4	2845·6	3146·2
High Speed Diesel Oil	136·7	112·3	503·3	823·3	1185·4	1605·9
Light Diesel Oil	175·9	231·8	161·7	170·2	177·9	185·5
Vaporising Oil	85·9	89·2	48·0	48·2	41·5	41·7
Jute Batching Oil	155·0	116·9	109·9	113·2	116·7	120·3
Mineral Turpentine	16·8	19·7	24·3	27·7	22·6	35·8
Solvent Oil	35·8	15·4	13·4	16·4	19·6	23·7
Bitumen	521·4	452·1	123·6	275·1	395·1	470·0

It is observed that the demand in 1957 was higher than that in 1948 as follows, which indicates the trend in demand:—

Aviation Spirit	145%
Motor Spirit	95%
Kerosene	280%
Diesel Oil	70%
Furnace Oil	50%

As regards motor spirit as well as furnace oil, the present production is not only sufficient but leaves a considerable surplus. Thus

while the country is producing a surplus of motor spirit, it is highly deficient in certain other products, particularly kerosene, Diesel Oil, Bitumen and Aviation spirit. Further, it is observed that the Second Five Year Plan had commented that the three Petroleum refineries in the country do not provide for the production of lubricating oils and petroleum coke, which have considerable importance to the industrial economy, and that in planning further developments connected with this industry this lacuna in the structure of the mineral oil industry has to be filled. At present, apart from the absence of necessary plant facilities, it is understood that the crudes that are not available from the Persian Gulf are not particularly rich in lubricating oil fraction. The Committee understand that the two refineries to be set up in the public sector are likely to produce aviation spirit, lubricating oil, as well as petroleum coke. It has also been brought to their notice that there is likely to be a surplus of fuel oils, which can be processed into standard types of diesel oils and that this matter is being examined at the Central Fuel Research Institute. The Committee recommend that the pattern of present imports should be continuously reviewed so as to make advance arrangements for their production in the existing refineries as well as those to be set up. In this connection it is observed that the proportion of the production of kerosene and diesel oil to the total production at the existing refineries is as follows:—

	Kerosene Oil	Diesel Oil
SVOC	14%	19%
Burmah-Shell	14%	15%
Caltex	18%	19%

The Committee were informed that the pattern of production depended on the type of crude oil production methods etc. and that any alteration in the production presented practical difficulties. *They recommend that Government should encourage research into the production methods to see to what extent the present pattern could be altered or the existing surpluses could be processed into other products particularly in view of surplus in the production of motor spirit. In this connection, it might be mentioned that the agreements for setting up the refinery also provide for discussion regarding the practicability of increasing the out-put of kerosene.*

C. Utilisation of by-products and gases

85. The following is an extract from the report of Mr. A. Giraud, Technical Director of the French Institute of Petroleum:—

> "It does not seem either that any chemical use has been made of the by-products of the big refineries installed near Bombay and Visakhapatnam. Those gases which are either flared or burnt at hearing value could be transformed into valuable chemicals (mainly plastics, solvents, synthetic detergents).

Refining of Nahorkatiya crude could give also due to the special composition of this crude, interesting raw materials; aromatic cycle stocks especially fit for the manufacturing of carbon black, aromatic cuts for solvents and plasticizers, paraffin waxes for synthetic detergents and plasticizers.

All those different possibilities should also be related with the possible utilisation of coke-oven gases.

A general study of the possible petro-chemical projects in connection with coal chemistry and alcohol chemistry should be made now, with following purposes:—

determining the possible uses of the different by-products; potential market in India.

comparing the different new materials to choose the best one in each case.

studying the possible transformation processes.

choosing the proper location."

The Committee understand that not much action has yet been taken on the above. They suggest that this be done expeditiously.

86. The Committee understand that during the proposed production and refining of oil from Nahorkatiya and Moran, natural gas to the extent of 45 million cft. daily of 100 BTU (equivalent to nearly 6 lakhs tons of fuel per annum) is likely to become available and that is likely to be of considerable use in this growing petro-chemical industry in manufacturing synthetic rubber, fertilisers, explosives, lubricants etc. *The Committee would suggest that there should be advance planning in respect of the utilisation of these gases in consultation with the Development Wing of the Ministry of Commerce and Industry.*

D. Pricing of products

87. The prices of petroleum products are not statutorily controlled at present but are fixed in accordance with a certain formula known as "Valued Stock Account Procedure" agreed to by Government with effect from 1st April 1950. The basic items included in this formula are the F.O.B. prices, ocean freights, post c.i.f. charges and remuneration at a fixed percentage of certain charges. The valued stock account is maintained by Burmah-Shell and is audited annually by their auditors; according to the formula, under/over recoveries from the market in a particular year are adjusted in future prices. The prices thus arrived at are also followed by the other oil companies.

(ii) The following table shows the prices of petrol and petroleum products in India and a few other countries, some of which are further from sources of supply than India.

Banker "C" (per gallon) Rs.		Motor spirit Rs.	Kerosene Rs.	Aviation spirit Rs.
0·475	Bombay	1·33	0·83	1·97
0·401	Karachi	1·27	0·83	1·33
0·59	Colombo	1·13	0·975	1·67
0·53	Rangoon	1·41	0·85	1·84
0·57	Singapore	1·16	Nil	1·63
0·65	London	1·195	0·97	1·42
..	Ankara	1·37	1·29	1·87
0·08	Baghdad	0·73	0·33	1·78
0·74	Sydney	1·38	1·25	1 81

The Committee fail to understand why there should be such disparities, as for example, of one anna per gallon between the price of motor spirit at Bombay, at Karachi and of 10½ annas per gallon in respect of aviation spirit. This difference, it might be pointed out, would, in all, amount to several crores of rupees annually.

The Committee were informed that the reasons for these disparities and the manner in which they could be reduced were being discussed with the Burmah Shell, the existing V.S.A. agreement being with them. They learn, however, from a recent statement made by the Minister in the House that these discussions have not led to any result yet.

The world oil picture is believed to have changed in the last few months and there has been a decline in the price of oil and petroleum products. It would be natural to expect that this country should also share in the benefits of this trend, particularly in view of the fact that the agreements entered into with the oil refineries provide that the prices of products *ex*-refinery should not be higher than Bombay landed cost, which itself would be affected by the recession in world oil prices. The claim for reduction has to be considered by oil companies and by government, the two important parties to the question and would have to take into account the level of the cost of production and refining, as well as transport and distribution. *The Committee wonder to what extent discussion between the parties would lead to any worthwhile result. They feel that a better arrangement might be to appoint by mutual agreement a body like the Tariff Commission or a team under the aegis of an international body to examine this problem with particular reference to the cost structure. In this connection, it may be mentioned that as far back as* 1928 *the Indian Tariff Board had examined various matters including the question of pricing relating to the oil industry in India. They suggest that the matter be examined*

further. They also suggest that the petroleum laws of the country might make some provision in regard to the prices of petroleum products in the country.

E. Quality Control

88. The Committee were informed in regard to the control exercised over the quality of petroleum products that as far as government was concerned there existed necessary arrangements for testing the purchases made by them at Kanpur and Alipur. However, as regards supplies in the country, they were informed that the I.S.I. was engaged on the work of laying down standard and specifications for petroleum products. They learn however that this matter has been under consideration for nearly three years but that no standards have yet been laid down. *The Committee recommend that this matter be expedited. Further, they recommend that a suitable machinery be also devised to enable effective quality control to be exercised.*

F. Synthetic Oil

89. (i) The following is an extract from the Thacker Committee report on "Requirements and utilisation of coal."

"In a country devoid or short of oil resources and served by poor roadways increase in high octane motor fuel consumption would appear to be somewhat anachronistic. It is certain that the demand for diesel fuels will increase greatly in India, and cannot be supplied from Petroleum resources alone. It is in this particular field that integration between coal and oil is easily possible by the utilisation of the by-product-tar of low temperature, carbonisation of coal, and by synthesising diesel oils and motor fuels from products of coal carbonisation and gasification.

Conversion of low temperature tar to diesel fuels and of liquid fuels similar in properties to the middle distillates by hydrogenation is an established process, but recent researches at the C.F.R.I. show that it can be further improved and cost lowered particularly for production of high speed diesel oil."

(ii) The Committee understand that the question of manufacture of synthetic oil was examined by an expert Committee headed by Dr. Ghosh. The schemes recommended by it include a long term plan and a short term plan. A high power Committee was also set up by Government with Shri K. D. Malaviya as Chairman to examine the question of getting petrol from coal. It made a report which is stated to be under the consideration of the Planning Commission. The Committee further learn that technical aspects of it have been considered and now it is mainly a question of economics, because of the finances and particularly the foreign exchange required for the purpose.

(iii) *The Committee recommend that this question be examined early after taking into account the overall position regarding the availability of oil as well as the production and refining capacity in the country.*

VI

PERSONNEL

A. Recruitment

90. Recruitment of the right type of men for the oil industry whether exploration, prospecting, production or refining is of importance in view of the international character of this industry which means that men must be recruited who possess ability in the human as well as in the administrative and technical skills. Further, since the success of any venture depends on the judgment, experience and training of the technical persons carrying it out, the question of proper training (both internal and external) of the technical manpower is also of great importance.

91. The Committee were informed that the O.N.G.C. being a departmental organisation the recruitment of its gazetted personnel is made invariably through the UPSC, that it has led to inordinate delays in recruitment and that this had considerably held up the progress of work.

The Committee consider this unfortunate and feel that with sufficient planning and forethought these delays could have been avoided. They hope, however, that the difficulties will be reduced when the Commission is given corporate status as recommended earlier.

92. The O. & N.G. Commission, originally selected most of its personnel particularly in the higher categories directly from its parent organization *viz.* the Geological Survey of India. As regards the other officers particularly in the junior category pursuant to the recommendations of the Soviet Experts which recommended *inter-alia* recruitment of raw university graduates for being put on the exploration work after requisite training, 124 graduates mostly in physics were recruited through the UPSC. They were given special training in theoretical and practical aspects of oil exploration under experienced foreign and Indian teams and have now been put on actual work. *The Committee have had in this connection a doubt expressed to them by a senior geologist that this mass recruitment of young officers not all of whom had full fundamental and theoretical training in Geophysics might at a later date result in partly trained personnel becoming 'senior men' under whom fully trained men to be recruited henceforth would have to work in lower grades and that this would not be conducive to the building up of efficiency or morale in the new organisation. The Committee would suggest that this view should be given due consideration and the desirability of imparting*

to these officers an intensive theoretical and practical course in specialised institutions for at least 6 to 8 months, might be examined. They would suggest that the desirability of attaching these officers for some time as understudies to experienced personnel of the Indo-Stanvac project, A.O.C. etc., besides the O.N.G.C. may also be examined. In this connection the Committee would urge that steps be taken to ensure that the foreign enterprises extend effective training to Indian trainees attached to them.

93. As regards future requirements it is understood that it would be possible to recruit Geology and Geophysics graduates from Universities and then to impart them thorough practical training within the O.N.G.C. itself. Geology courses are stated to be available in at least 10 centres in India and nearly 100 post-graduate students pass out of them every year, Geophysics courses are available at 4 institutions, *viz.* the Indian Institute of Technology at Kharagpur, the Andhra University, the Banaras Hindu University and the Indian School of Mines and Applied Geology at Dhanbad and at least 30 post-graduate students pass out of them every year. Steps were also being taken to establish degree courses in petroleum Technology at the Indian Institute of Technology and the Indian School of Mines and Applied Geology. These it was stated, would meet the requirements of technical personnel in the fields of geology and geophysics. *The Committee suggest, in this connection, that a full-fledged All-India Petroleum Technological Institute on the lines of those in France and Russia might be set up preferably at one of the existing institutions, in collaboration with them as well as the National Physical Laboratory, the Fuel Research Institute etc.*

B. Training of Indian Personnel

94. The Oil & Natural Gas Commission initially recruited 8 mechanical engineers and sent them for training in drilling at the Assam Oil Company & Standard Vacuum Oil Company drilling sites. 8 drillers were also sent to Russia for a period of one year for training in Drilling methods, while six more are being sent. Another officer was sent to France for training in Drilling methods. Other drilling staff of the Oil & Natural Gas Commission are receiving training at Jawalamukhi as understudies with the expert Rumanian and Russian Drillers on contract with or employed by the Oil & Natural Gas Commission. It is also stated that more drillers will be trained by the Russian Drilling experts when drilling operations start in Cambay and other places.

95. Drilling is a very important operation which requires use and careful handling of cost'y equipment. Operations involving drilling which have so far not been undertaken on the scale recommended by the Soviet experts, are bound to increase considerably in future. *The Committee recommend that as much training and experience as possible should be given to drillers and in larger numbers so as to enable them to perform their operations successfully and efficiently.*

C. Personnel Requirements of Oil India Ltd. and Refineries

96. As regards the personnel requirements of Oil India (P) Ltd., for production of oil as well as of the two oil refineries to be set up in the public sector, *the Committee would suggest that there should be advance planning particularly in respect of recruitment and training so as to enable well-trained Indians to be put in responsible position both on production work and pipelines as early as possible.* It was stated that, the Government had asked the American Refinery Consultants, to give an estimate of the requirements of technical man-power. Further, there is also a proposal to establish a training school, probably in Bombay to meet the technical man-power requirements of the two new oil refineries in the public sector.

97. *The Committee hope that the proposed Technical Training School would be established in close co-ordination with the existing training courses already available in the Oil Refineries in the Private Sector.*

Further, *they would suggest that the training facilities provided by the Institute Francais Du Petrole, Paris (IFP) with particular reference to the recommendations made by Mr. A. Giraud, Technical Director of the Institute and other similar institutions abroad as well as under the various aid schemes should be fully availed of in this matter. An indication of the requirements of petroleum technicians over a period of say five years may also be given to the Ministry of Education and Scientific Research so that the latter may ensure that an appropriate number took up the subject of petroleum engineering, including refining and applied geophysics in important overseas institutions.*

D. Staff utilisation

98. It has been pointed out in para 36 that the expenditure on pay and allowances of (i) officers, and (ii) establishment in 1957-58 was five times and two times respectively, of the expenditure in 1956-57 while in 1958-59 it is expected to be 8 times and five times respectively. It has also been pointed out earlier that even quantitatively the survey and exploration work has fallen considerably behind what was envisaged. In this connection a doubt was expressed to the Committee whether the actual out-put so far, as well as the present programmes, justified the maintenance of officers and staff at the present strength. A view was also expressed to them that the staff, particularly the technical, felt somewhat frustrated that they did not have adequate work and opportunities. The Committee consider this unfortunate, if true. They, therefore, inquired whether it would not be possible to fix norms and work loads for employment of officers and staff so as to maintain them at the optimum level. They were told that while certain broad quanta were taken into account, it was not desirable to lay them down in a matter like geological surveys where conditions differed from area to area, with equipment, persons etc. *The Com-*

mittee feel, however, that it should be possible to lay down certain norms over which variations could be allowed to suit various conditions. In this connection, the review of output with reference to that in other countries and private companies suggested in para 39 is also pertinent. The Committee also suggest that all this be done expeditiously and further recruitment made thereafter.

E. Foreign experts

99. In the last three years as many as 9 foreign oil experts have visited India and made a number of recommendations in regard to the exploration programmes in the country. Further in view of the dearth of experienced Indian Personnel, a number of foreign personnel notably from Russia and Rumania have been employed at the head-quarters of ONGC at Dehra Dun and on the actual work sites. They include the Chief Drilling Engineer, Geologist, Consultant, Geologist Adviser, two Laboratory experts, a Seismic Party of 15, a Gravity party of 11, some technicians and even 2 interpreters. Their number at present is 38 and is likely to increase to 70. Of the total of the expenditure of Rs. 30·52 crores proposed for the 2nd Plan for oil development the provision for services of foreign experts alone amounts to Rs. 2·67 crores. The provision for 1956-57 and 1957-58 amounted to Rs. 60·72 lakhs, while the provision for Soviet experts would increase from 3·13 lakhs in 1956-57 to 31·65 lakhs in 1958-59. The actual expenditure for 1957-58 is stated to be of the order of Rs. 19 lakhs of which Rs. 6½ lakhs was spent on pay alone upto September, 1957. *The Committee while appreciating the assistance given by the Soviet and Rumanian Experts so far recommend that understudies should be provided in adequate measure to all these experts to enable them to take over their duties as early as possible, retaining a few experts thereafter mainly for advisory work. Further, the feasibility of obtaining experts for this purpose under the various aid schemes may also be explored.*

VII

RESEARCH

100. The Committee were informed that there are no research facilities in India at the moment relating to Petroleum technology. Further, no research is at present conducted by or on behalf of the O.N.G.C. or government for developing alternative sources of supply or to develop substitutes. No regular liaison is also being maintained with foreign institutions. However, steps are likely to be taken to maintain liaison with Petroleum Institutes abroad particularly at Leningrad. When Petroleum Experts from other countries visit the Organisation, first hand information, it is stated, is being collected from them regarding various aspects of the oil industry.

101. The Committee were informed that the O. & N. G. Commission's Central Laboratory at Dehra Dun was being expanded gradually to facilitate research in Palaeontology, Palynology, Petrology, physical and chemical properties of drilling mud and cements for oil well, all of which taken together help in oil exploration. The Central Fuel Research Institute, Jealgora, is also being equipped for research work on refining.

102. *The Committee feel that there is extensive scope for research in various matters relating to oil technology and suggest that Government should arrange for coordinated and well-directed research, in coordination with the existing refineries particularly on the following which require early attention:—*

(i) *Reduction of cost of exploration.*

(ii) *Conservation of resources.*

(iii) *Measures to increase productivity.*

(iv) *Improvement in refining to suit the Indian requirements with particular reference to the demand for kerosene, diesel oil, aviation spirit, lubricants, etc. as against surplus of motor spirit.*

(v) *Conversion of fuel oil into diesel oil.*

(vi) *Use of natural gas, e.g., methane, etc. as well as those arising in production and refining of oil.*

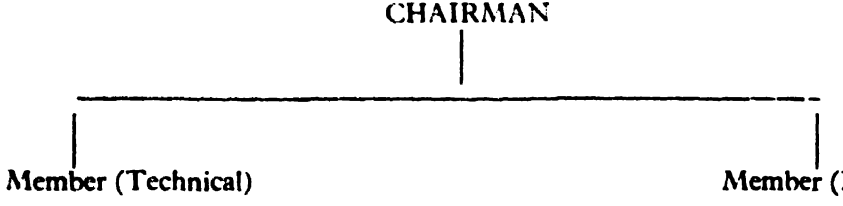
(vii) *Development of petro-chemical industry, etc.*

The Committee suggest that the proposed Petroleum Technological Institute recommended earlier should also cater to the research requirements in the country.

APPENDIX I

(For comments please see paras 10, 16 and 17 of the Report)

ORGANISATIONAL SET-UP OF THE OIL AND NATURAL GAS COMMISSION



Directorate of Geology				Directorate of Geophysics				Directorate of Engineering				Commission Office			
P	S	F		P	S	F		P	S	F		P	S	F	
1	1	1	Director of Geology (1800—2000)	1	1	1	Director of Geophysics (1800—2000)	1	..	..	Director of Engineering	1	1	1	Secretary to Commission (1300—1800)

1	..	..	Chief Geologist (1600—1800)	1	..	..	Chief Geophysicist (1600—1800)	1	..	..	Senior Drilling Engineer (1300—1600)	1	1	1	Deputy Secretary (600—1150)
5	4	3	Suptdg. Geologist (1300—1600)	2	2	2	Suptdg. Geophysicist (1300—1600)	4	4	..	Senior Driller (Deep Drilling) (800—1300)	1	1	..	Civil Engineer (800—1150)
17	11	11	Geologist (Senior) (600—1150)	9	3	2	Geophysicist (Senior) (600—1150)	2	..	..	Senior Driller (Structural) (600—1150)	5	3	1	*Senior Adm. Officer (600—1150)

NOTES : * The distribution of such administrative personnel over the three Directorates and the Commission's Office has not yet been finalised.

P—Posts proposed under E.F.C.

S—Posts sanctioned

F—Posts filled

Figures in the brackets show the scale of pay in Rupees.

APPENDIX II

A comparative statement of the functions of the Indian Bureau of Mines, Oil and Natural Gas Commission and Geological survey of India (for comments please see para 22 of the Report)

MINISTRY

[Policy, Administration, Budget, Mines and Minerals (Regulation and Development) Act, 1949 and Rules framed thereunder, Indo-Stanvac Petroleum Project.]

INDIAN BUREAU OF MINES	OIL & NATURAL GAS COMMN.	GEOLOGICAL SURVEY OF INDIA
1	2	3
The functions of the Bureau are : (*i*) Advising the Central and State Governments on all matters relating to the mineral concessions, and also on the exploration, exploitation and utilisation of the country's mineral resources. (*ii*) Periodic inspection of mines, for affecting the systematic development of mineral deposits, the elimination of avoidable waste, and the promotion of improved methods of mining. (*iii*) Conducting drilling and other prospecting operations to prove and estimate the workable reserves in material deposits and to conduct test	The functions of the Commission include the following: (*i*) Advising the Central Government on matters relating to the exploration, exploitation and refining of the country's oil and natural gas resources. (*ii*) Subject to the general or specific instructions of Government (a) conducting geological and geophysical surveys for the exploration of oil, (b) conducting drilling and other prospecting operations independently or in conjunction with other Government or private organisations to prove and estimate the workable reserves of oil deposits;	The G.S.I. is responsible for the preparation of the geological map of India which forms the basis of all geological work including the appraisal of the mineral deposits of the country. In addition, this Survey undertake special investigations of an economic nature, *e.g.* exploration and testing of mineral deposits, drilling or exploratory mining, water and engineering problems, etc. In the case of all large projects like those proposed to be undertaken by the Central Water and Power Commission, the Damodar Valley Corporation and large industrial projects such as proposed iron and steel plants, coal and petroleum

1	2	3
mining independently or in conjunction with other Government or private organisations. (*iv*) Conducting research on the beneficiation of low grade ores and the industrial utilisation of minerals and mineral products as well as on mining problems, in collaboration with other research organisations. (*v*) Conducting analysis of ores and minerals in connection with the work of the Bureau, and also for the public as far as time and circumstances permit. (*vi*) Collection and publication of statistics relating to mineral production in India, mineral stocks, exports, local consumption, etc., and collection and maintenance of information regarding world mineral production, world mineral trade, foreign mining rules, and other related matters. (*vii*) Publication of bulletins and monographs on investigations relating to mining and mineral industry. (*viii*) Assisting the mineral trade in the marketing of minerals. (*ix*) Undertaking any other functions entrusted to the Bureau by the Central Government from time to time.	(c) establishing production of oil including preliminary processing and storage ; (d) administration and implementation of the agreements with oil companies for joint or participatory working, inspection of oilfields held by private concessionaires for ensuring the systematic development of oil, the elimination of waste, and the promotion of improved methods of recovery. (*iii*) Conduct of geological, chemical and other laboratory investigations in connection with the work of exploration, production or refining of oil. (*iv*) Collection and publication of statistics relating to oil and natural gas produced in the country and maintenance of information regarding world production trade mining rules and other related matters. (*v*) Publication of bulletins and monographs on investigations relating to oil and natural gas. (*vi*) Undertaking any other function entrusted to the Commission by the Government of India from time to time.	plants, etc., the first stage in their planning always forms the work and responsibility of the Geological Survey. The field study of earthquakes effects also forms a part of the functions of the Geological Survey of India.

APPENDIX III

Summary of conclusions and recommendations

Serial No.	Paragraph No.	Recommendation
1	2	3
1	9	The Committee feel that if the O.N.G.C is to function efficiently as an industrial body, it must be armed with sufficient powers and given sufficient status so as to provide flexibility in administration as well as operation. The Commission were informed that a proposal to convert the Commission into a statutory organisation with wider delegation of powers was under consideration but that it may take some time. The Committee fail to understand why there should be any delay in taking a decision on an important organisational matter like the status and powers of the O.N.G.C. on which the successful and effective functioning of the venture to find oil would depend to a considerable extent. They recommend that an early decision be taken to convert the Oil and Natural Gas Commission into an autonomous body with suitable provisions for control by Parliament.
2	10	The Committee feel that the Minister for Mines and Oil should not be burdened with the day-to-day work and management of the Commission and that a Chairman or a Vice-Chairman preferably with technical qualifications should be appointed on a full time basis to execute the policies laid down by Government.
3	11	The Committee consists of only one technical Member who is expected to carry out all the technical activities of the Commission. The Committee feel that the absence of experienced technical personnel at the top could lead to wrong directions which considering the magnitude of the expenditure might result in infructuous expenditure. The proposed statutory Commission should, therefore, consist of experienced geologists and geophysicists amongst its technical members, so that the Commission

1	2	3
		may have the benefit of technical advice from more than one Member. The Committee recommend that the O. N. G. C. should be reconstituted on this basis particularly in view of the proposed expansion in its activities.
4	12	The Committee recommend that when according statutory status to the O.N.G.C. care should be taken to ensure that the top management consists, besides the Chairman and technical members of non-officials with experience in business and finance but with no financial interest in the industry.
5	13	The Committee are aware that there is a dearth of qualified persons in the country for holding high technical posts. They would, therefore, suggest as a purely temporary measure that it might perhaps be advantageous to employ an experienced and reliable foreign oil Adviser to advise the O.N.G.C. in technical matters as well as during discussions with foreign oil concerns with whom the Government and Commission come into contact. For this purpose, the feasibility of seeking assistance from the World Bank or some other similar Agency or under one of the Aid Schemes should be examined.
6	15	The Committee feel that having set up a technical body of the status of the O.N.G.C. to deal with the exploration, exploitation and production of oil in the country, it should be given the function and responsibility of administering all the activities pertaining to oil in the country, such as exploration including private participation, exploitation, production, refining, storage, distribution, inspection, etc., so as to deal with the subject comprehensively. They recommend that this aspect should be given due consideration when the question of giving statutory status to the O.N.G.C. is considered.
7	17	The Committee have recommended earlier that the Commission should consist of a full-time Chairman and technical Members. Once this is done, it should be possible for the Members to function as Heads of the Directorates and it might no longer be necessary to retain the posts of the three Directors. These suggestions would also be more or less in accord with those made by the various oil experts who visited the

1	2	3
		country. The Committee recommend that all these aspects should be borne in mind when reconstituting the O.N.G.C. and also while creating the posts of Chief Geologist and Senior Drilling Engineers. This is particularly necessary so that the suggested constitution itself may not result in more senior officers being engaged than necessary.
.8	22	The Committee feel that the Branch Offices of the O.N.G.C. have grown up in a somewhat haphazard fashion employing technical staff in cities as well as large office staff and lower staff. The Branch Office at Delhi particularly seems to have very little justification since the work, if any, could be done by the Ministry itself. There is a Private Secretary (Rs. 300—400), and one Selection Grade Stenographer (Rs. 200-300) attached to the Member (Finance). . Similarly the Jwalamukhi Office includes a Public Relations Officer who is stated to be mainly concerned with land acquisition. Further, the Branch Office at Calcutta might concentrate on work relating to liaison with the Indo-Stanvac Project. The Committee recommend that there should be a complete review of the functions of the Branch Offices particularly in regard to the receipt and purchase of stores with a view to their abolition or at least a reduction in their strength.
9	23	Having taken note that the O.N.G.C. has not yet admittedly been systematically organised, the Committee recommend that the Commission, particularly after the suggested reconstitution, should devote its urgent attention to setting all its organisational affairs on a systematic footing.
10	25	While the Committee agree that policy matters on which Government decisions are required have to be dealt within the Ministry, they feel that with the autonomous set-up and with increased functions and responsibility recommended by them for the O.N.G.C. the work undertaken in the Ministry as well as the staff employed therein should be reduced and handed over to the O.N.G.C. The Committee, therefore, recommend that the proposal to add one Deputy Secretary and two Under Secretaries in the Department of Mines and Fuel to cope with the increase in work should be reconsidered.

1	2	3
11	28	The Committee feel that to be an effective advisory body, the Standing Committee on Oil set up by Government should be consulted on all important matters relating to the Oil Industry in India, *e.g.*, exploration of oil and petroleum laws, exploitation, production, refining, collaboration with private concerns, agreements, prices, transport, etc. Its advice should be available to the O.N.G.C. besides the Ministry, particularly after the former is given independent status as recommended by the Committee elsewhere.
12	29	The Committee further suggest that the Standing Committee on Oil should be reconstituted and made broad-based so as to give representation on it not only to the various official interests concerned but also the State Governments likely to be interested and non-officials, including members of legislatures who have studied the subject, mining interests etc. This broad-based Committee might then form Sub-Committees to deal with groups of allied subjects so as to make for speedy and business-like discharge of work.
13	30	The Committee feel that, besides the above Standing Committee, it might be desirable to form a Consumer Council to protect the consumer interests of various petroleum products. They, therefore, recommend that this question be expeditiously examined.
14	31	The Committee feel that pursuant to the provisions of the Industrial Policy Resolution of 30th April, 1956, which envisages *inter alia* that workers and technicians should, wherever possible, be associated progressively in management and Enterprises in the public sector should set an example in this respect, the Oil and Natural Gas Commission might set up a workers council.
15	33	Whatever the merits of having three separate bodies namely the G.S.I., the I.B.M. and O.N.G.C. to deal with the survey and exploratory work in respect of various minerals in the country, it is very desirable that there should be adequate coordination among them so as to avoid overlapping and duplication in their activities. The Committee recommend that to ensure coordination among these bodies, liaison

1	2	3
		committees at various spheres should be constituted which should meet at regular intervals and ensure that the plans drawn up by the respective organisations do not overlap those of others or involve duplication of work, personnel, purchases, etc. during the same year or over a period of years.
16	37	It is observed that the total actual expenditure incurred by the O.N.G.C. in the first two years of the Second Plan period has been Rs. 3 crores as against Rs. 8·7 crores envisaged for this period. Of this the expenditure on operation work has been only Rs. 1·8 crores as against Rs. 8·5 crores recommended by the Soviet experts. The Committee wonder whether at the present rate of expenditure and progress there is any reasonable prospect of fulfilling the targets within the Plan period. It is, therefore, necessary that the O.N.G.C. should give highest priority to the drawing up of comprehensive plans to fulfil the Plan targets, both monetarily and physically, during the rest of the Plan period. They also feel that there is scope for intensifying the work of survey and drilling and increasing the proportion of expenditure on such work to the total expenditure.
17	38	Considering the volume of oil the country has to import it has to strive, leaving no stone unturned, to explore every possible source of oil in the country. One of the main difficulties in doing so is likely to be how to find the finance required for the purpose. The amount of expenditure required to mobilise the oil resources has been estimated to be very large. The Committee would suggest in this connection that the feasibility of setting up an Oil Development Fund by levying a cess on petroleum products or converting a part of an existing excise duty into a cess and of assigning it to the Commission might be considered. The feasibility of obtaining loans from the World Bank or other U.N. agencies or other sources for developing the oil resources in the public sector might also be considered.
18	40	It has been represented to the Committee that the unit cost of operation in the O.N.G.C. is very low as compared to that in Canada, as far as

1	2	3
		exploration is concerned. The Committee feel that such an empirical deduction would not be correct in the absence of full comparative details such as size of party, quantitative and qualitative, output per individual in terms of area surveyed etc. for the various organisations referred to above. The Committee would suggest that a fair comparison between the unit cost of operation of the O.N.G.C. should be attempted by the O.N.G.C. and the Committee apprised of it in due course.
19	41	The Committee feel that the costs of exploration according to O.N.G.C. standards are higher than the Soviet experts standards, which would indicate that there is scope for reducing the costs of exploration in India by O.N.G.C. They, therefore, hope that as a result of the review suggested by them it would be possible to reduce the exploration costs in India.
20	43	It is seen that during the first two years of the Second Plan the actual expenditure of the O.N.G.C.has considerably fallen short of the budget estimates, The Committee are not satisfied with the reasons given for the variations and the shortfalls in expenditure. They feel that these reveal not only poor budgeting but what is much more serious, poor planning without reference to the availability of resources, personnel, equipment, etc. on the part of an important organisation like the O.N.G.C. The Committee recommend that these matters should be given topmost attention and every attempt made to improve budgeting as well to draw up realistic plans.
21	44	The Committee feel that one of the reasons for defective budgeting and planning might be the system of accounts followed by the O.N.G.C. They consider that the O.N.G.C. should maintain accounts in a commercial form and that they should be available for scrutiny in that form. The Committee, therefore, recommend that the Commission should take immediate steps to draw up and maintain commercial accounts of its expenditure or at least to maintain them in a *pro-forma* manner.

1	2	3
22	45	The Committee recommend that the O.N.G.C.should develop statistical and analytical techniques for the purpose of realistic budgeting at least in respect of operational expenditure, instead of basing it merely on certain items of expenditure like wages, stores charges, etc. The Committee feel that the entire organisation and the system of accounts should, as early as possible, be put on a more satisfactory footing in consultation with the C.C.A.O. of the Government of India as well as other cost accounts experts. They recommend that the O.N.G.C. should give early attention to all these requirements.
23	46	The Committee recommend that simultaneously with the setting up of a cost accounts organisation, action should be taken to set up an internal audit organisation to conduct a continuous audit of transactions and payments particularly at the outstations.
24	48	The Committee have pointed out elsewhere that there is scope for further savings in various directions, particularly in the expenditure and staffing of Delhi and Calcutta Branch Offices, the two of which cost over 10% of the total charges of pay of officers and establishment of the O.N.G.C. as also in the proposed increase in the Ministry. The Committee recommend that early action to effect these economies so as to secure better use for the monies saved should be taken.
25	56	The Committee consider the recommendation of the Soviet Oil experts that the rate of output of the exploration parties in India should be increased, as of particular importance and recommend the need for a review with reference to position in other countries.
26	64	The Committee recommend that the implementation of the decision taken in regard to drilling in Cambay and Gogha should be expedited.
27	66	According to an eminent geologist the Ganga Valley area is potentially oil-bearing and that if oil is found in this area it would be in quantities which would be commercially profitable. The Committee recommend that this view may be given due consideration.
28	67	In view of the various encouraging factors which have occurred in Assam the Committee recommend that Government should attempt at greater exploration for oil in that area than has been the position so far.

1	2	3
29	68	The Committee understand that West Bengal was considered a promising area by the Soviet and other experts. They, therefore, hope that these views would be taken into account in determining the exploration policy for future and that measures would be taken to explore the oil potentialities of this region.
30	69	It is evident that the progress in regard to the survey and exploration of even the potentially oil-bearing areas in the country has been very tardy and has fallen far short of the targets recommended by the Soviet oil experts. They, therefore, recommend that the O.N.G.C should give special attention towards preparing and executing a dynamic programme for the surveys, mapping and exploration of potential oil-bearing areas in the country, in as short a period as possible.
31	70	The Committee would recommend that the co-operation of the private sector may also be obtained in the task of the exploration of oil within the framework of the Industrial Policy Resolution of 30th April, 1956 under which the expansion of the existing privately-owned units or the possibility of the State securing the co-operation of private enterprise in the establishment of new units when the national interests so require is not precluded and the State has to ensure in such cases either through majority participation in the Capital or otherwise, that it has requisite powers to guide the policy and control the operation of the undertakings.
32	72	The Committee were informed by the Ministry that the Petroleum Concession Rules were being revised so as to bring them in line with the Industrial Policy Resolution and that pending this revision, it was decided by Government in January, 1955 not to grant any fresh petroleum concession. The Committee regret to observe that the Petroleum Concession Rules which were then under revision and consideration have not still been finalised. The policy not to grant licences has thus been in force for nearly 3½ years and what is more, none of the oil concerns seems to be aware of it. The Committee feel that the question of exploration and prospecting and even mining of oil has to be viewed from practical considerations and expediency.

1	2	3
		At present the resources and know-how of the O.N.G.C. are limited and not all its personnel are sufficiently experienced. A liberal policy should, therefore, be adopted in this matter as has in fact been done in several other countries. While direct exploration, etc. by governmental agencies should continue and in fact should steadily expand, for some years to come, private concerns should to the extent possible be given licences to undertake exploration work, with or without Government participation, depending on the availability of resources, subject, of course, to the requirement of the Industrial Policy Resolution. Further, the policy should be flexible to suit each case but not one of vacillation or of inaction. The Committee recommend that early decisions should be taken in all these matters and that they should be announced to prevent any misapprehension in any quarters.
33	73	The Committee feel that the employment of a number of private contractors for exploration and prospecting work, particularly for drilling would hasten the work and also enable proper comparison to be made of the expenditure incurred by different agencies so as to control and economise the cost.
34	74	The Committee recommend that the Petroleum & Natural Gas (Regulation & Development) Rules should take cognizance of all the changing patterns abroad as well as of the liberalized policies recommended earlier and that they should be such as would make possible a flexible approach rather than any rigid approach. While making provision for payments of royalties, taxes, etc., the rules might provide also for the rendering of all information to Government and for supervision over the activities to ensure that the areas are investigated intensively and that there is no waste of resources. Finally, the Committee recommend that the issue of these revised rules pending for the last three or more years should be expedited.
35	75	The Committee suggest that the data collected by the O.N.G.C. may also be got examined on regular basis by independent foreign as well as Indian experts. For this purpose, they would suggest that the feasibility of setting up a panel of such consultants and/or a technical advisory committee of independent experts might be examined.

1	2	3
36	77	The Committee consider it unfortunate that as a result of the delay in reaching an agreement with A.O.C. for five years for exploitation of Nahorkatiya crude the country has had to import petroleum products of the estimated value of Rs. 40-50 crores a year. It was explained that the protracted negotiation which preceded the agreement were due to the desire of the Government to get reasonable terms from A.O.C. to exploit the reserves. The Committee hope that the lessons learnt from these negotiations would be kept in view when similar negotiations are entered into in future.
37	80	(*i*) The agreement with the A.O.C. in regard to the formation of Oil India Ltd., contains certain features which do not seem to be very satisfactory. The Committee hope that an energetic officer with suitable qualifications would be appointed at an early date as the Special Director on the Board to take proper care of the country's interests.
	80	(*ii*) The Committee hope that all the projects (*i.e.* production, transport of crude, refining, transport of refined products in respect of the Nahorkatiya oil fileds, as also of Moran oil fields where oil is reported to have been struck, will be executed expeditiously keeping in view the volume of imports which involve delays in production.
38	81	The Committee would suggest that the Government policy in regard to distribution of petroleum products after the refineries in the public sector go into operation should also be determined at an early date to enable action to be initiated sufficiently early for its implementation.
39	83	The Committee recommend that consideration of the proposals from Indian enterprises to set up refineries in India may be expedited keeping in view the provisions of the Industrial Policy Resolution of 30th April, 1956.
40	84	The Committee recommend that the pattern of present imports should be continuously reviewed so as to make advance arrangements for their production in the existing refineries as well as those to be set up. They further recommend that Government should encourage research into the production methods to see to what extent the present pattern could be altered or the

1	2	3
		existing surpluses could be processed into other products, particularly in view of the surplus in the production of motor spirit. In this connection, it might be mentioned that the agreements for setting up the refinery also provide for discussion regarding the practicability of increasing the output of kerosene.
41	85	The Committee understand that not much action has yet been taken on the report of M. A. Giraud, Technical Director of the French Institute of Petroleum, regarding the utilisation of bye-products etc. of the refineries and suggest that this be done expeditiously.
42	86	The Committee would suggest that there should be advance planning in respect of the utilisation of gases which would be available during the production of refining of Nahorkatiya crude in consultation with the Development Wing of the Ministry of Commerce and Industry.
43	87	The Committee feel that it would be better to appoint by mutual agreement a body like the Tariff Commission or a team under the aegis of an international body to examine the problem relating to oil pricing with particular reference to the cost structure. They also suggest that the petroleum laws of the country might make some provision in regard to the prices of petroleum products in the country.
44	88	The Committee recommend that the question of laying down standards and specifications for supply of petroleum products in India which is under the consideration of the Indian Standards Institution for the last three years be expedited. They further recommend that a suitable machinery be also devised to enable effective quality control to be exercised.
45	89	The Committee recommend that the question of the manufacture of synthetic oil be examined early taking into account the overall position regarding the availability of oil as well as the production and refining capacity in the country.
46	91	The Committee consider the delay in recruitment of personnel as unfortunate but feel that with sufficient planning and forethought, these delays

1	2	3
		could have been avoided. They hope however that the difficulties will be reduced when the Commission is given corporate status as recommended earlier.
47	92	A view was expressed to the Committee by a senior geologist that the mass recruitment of young officers not all of whom had full fundamental and theoretical training in Geophysics might at a later date result in partly trained personnel becoming 'senior men' under whom fully trained men to be recruited henceforth will have to work in lower grades and that this might not be conducive to the building up of efficiency or morale in the new organisation. The Committee would suggest that this view should be given due consideration and the desirability of imparting to these officers an intensive theoretical and practical course in specialised institutions for at least 6 to 8 months, might be examined. They would suggest further that the desirability of attaching these officers for some time as understudies to experienced personnel of the Indo-Stanvac project, A.O.C. etc. besides the O.N.G.C. may also be examined. In this connection they would urge that steps be taken to ensure that the foreign enterprises extend effective training to Indian trainees attached to them.
48	93	The Committee suggest that to meet the requirements of technical personnel in the fields of geology and geophysics a full-fledged All-India Petroleum Technological Institute on the lines of those in France and Russia might be set up preferably at one of the existing institutions in collaboration with them as well as the National Physical Laboratory, the Fuel Research Institute etc.
49	95	The Committee recommend that as much training and experience as possible should be given to drillers in larger numbers so as to enable them to perform their operations successfully and efficiently.
50	95	The Committee would suggest that there should be advance planning particularly in respect of recruitment and training of personnel required for Oil India (P.) Ltd., and the two oil refineries to

1	2	3
		be set up in the public sector so as to enable well-trained Indians to be put in responsible position both on production work and pipe-lines as early as possible.
51	97	(*i*) The Committee hope that the proposed school for technical training would be established in close liaison with the existing training courses already available in the Oil Refineries in the Private Sector.
	97	(*ii*) They also suggest that the training facilities provided by the Institute Francais Du Petrole, Paris (IFP) with particular reference to the recommendations made by M. A. Giraud, Technical Director of the Institute and other similar institutions abroad as well as under the various aid schemes should be fully availed of in this matter.
	97	(*iii*) An indication of the requirements of petroleum technicians over a period of any five years may also be given to the Ministry of Education and Scientific Research so that the latter may ensure that an appropriate number took up the subject of petroleum engineering, including refining and applied geophysics, in important overseas institutions.
52	98	The Committee feel that it could be possible to lay down certain norms and work loads for staff particularly in the technical staff so as to maintain them at optimum level. In this connection, the review of output with reference to that in other countries and private companies suggested in para 40 is also pertinent. The Committee suggest that all this be done expeditiously and further recruitment made thereafter.
53	99	The Committee while appreciating the assistance given by the Soviet and Rumanian Experts so far recommend that under-studies should be provided in adequate measure to all these experts to enable them to take over their duties as early as possible, retaining a few experts thereafter mainly for advisory work. Further, the feasibility of obtaining experts for this purpose under the various aid schemes may also be explored.

1	2	3
54	102	(*i*) The Committee feel that there is extensive scope for research in various matters relating to oil technology and suggest that Government should arrange for co-ordinated and well-directed research, particularly on the following which require early attention : (*i*) Reduction of costs of exploration. (*ii*) Conservation of Resources. (*iii*) Measures to increase productivity. (*iv*) Improvement in refining to suit the Indian requirements with particular reference to the demand for kerosene, diesel oil, aviation spirit, lubricants etc. as against surplus of motor spirit. (*v*) Conversion of fuel oil into diesel oil. (*vi*) Use of natural gas, *e.g.*, methane,etc., as well as those arising in production and refining of oil. (*vii*) Development of petro-chemical industry etc.
	102	(*ii*) They also suggest that the Proposed Petroleum Technological Institute recommended earlier should also cater to the research requirements in the country.

APPENDIX IV

ANALYSIS OF RECOMMENDATIONS CONTAINED IN THE REPORT

	No.
I. Classification of Recommendations	
A. *Recommendations for improving Organisation* . (S. Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 20, 21, 22, 23 of the Summary of Recommendations).	18
B. *Recommendations with regard to the Programme of work* (S. Nos. 16, 17, 18, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54 of the Summary of Recommendations).	33
C. *Recommendations for effecting economy* . . . (S. Nos. 10, 19, 24 of the Summary of Recommendations)	3
TOTAL .	54

II. Monetary Value of Economy

It is not possible to calculate the monetary value of the economies which might be effected as a result of implementation of the recommendations cited above.