C.P.U. No. 195

COMMITTEE ON PUBLIC UNDERTAKINGS (1971-72)

(FIFTH LOK SABHA)

FOURTEENTH REPORT

[Action taken by Government on the recommendations contained in the Sixty-Eighth Report of the Committee on Public Undertakings (Fourth Lok Sabha)]

BOKARO STEEL LTD.

(Ministry of Steel and Mines)

LOK SABHA SECRETARIAT
NEW DELHI

April 1972/*Chaitra*, 1894(S)
Price : Rs. 3.00

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7. Smt. Subhadra Joshi

INTRODUCTION

I, the Chairman, Committee on Public Undertakings, having been authorised by the Committee to submit the Report on their behalf, present this Report on the Action Taken by Government on the recommendations contained in the 68th Report of the Committee on Public Undertakings (4th Lok Sabha) on Bokaro Steel Ltd.

2. The 68th Report of the Committee on Public Undertakings was presented to the Lok Sabha on the 29th April, 1970. Government furnished their replies indicating the action taken on the recommendations contained in the Report on 24th April, 1971. Further clarification in respect of certain recommendations was called for from the Government on 15th September and 24th December, 1971 and replies thereto were received between 16th October, 1971 and 14th February, 1972.

3. The replies of Government to the recommendations contained in the aforesaid Report and further information called for from the Ministry were considered and approved by the Committee on the 21st January, 1972 and the Chairman was authorised to finalise the Report on the basis of the decisions of the Committee. The Report was adopted by the Committee on the 3rd April, 1972.

4. The Report has been divided into following five Chapters :—

(i) Report.

(ii) Recommendations that have been accepted by Government.

(iii) Recommendations which the Committee do not desire to pursue in view of the Government replies.

(iv) Recommendations in respect of which replies of Government have not been accepted by the Committee.

(v) Recommendations in respect of which final replies of Government are still awaited.

5. An analysis of the action taken by Government on the recommendations contained in the 68th Report of the Committee is given in Appendix V. It would be observed, therefrom that out of 56 recommendations made in the Report 36 per cent have been accepted by Government. The Committee do not desire to pursue 43 per cent recommendations in view of Government's replies. Replies of Government in respect of 21 per cent of the recommendations have not been accepted by the Committee.

NEW DELHI;
April 17, 1972
Chaitra 28, 1894 (*S*)

M. B. RANA,
Chairman,
Committee on Public Undertakings.

CHAPTER I

REPORT

A. Revision of Capital Estimates of Bokaro Steel Project

Recommendation (S. No. 9, para 3.40)

In para 3.40 of their 68th Report (1969-70), the Committee pointed out that 'in the Demands for Grants for 1967-68, it had been stated that after taking into account the effects of devaluation and proposals of cost reduction agreed upon by the Soviet side the revised cost of first stage of the plant as sanctioned by Government is Rs. 620 crores (excluding off-site facilities which are estimated to cost about 50.4 crores of rupees approximately). Having obtained the approval of Parliament to specified figures, the management was committed to complete the first stage of Bokaro within that amount unless Parliament had approved of the revised estimates. The Bokaro Steel Ltd., should have taken the first opportunity of informing Government and Parliament about the extent of revision in the estimates stating also clearly as to how it would affect the economics of the plant. They, however, find that even the Demands for Grants for 1970-71. made no definite mention about the extent to which the increase in estimates was likely to be. The Committee highly deprecate the complacent attitude of the Government towards the escalation of estimates to such a magnitude (Rs. 90 crores) and they recommend that in future earliest opportunity should be taken to inform Parliament about major increases in estimates of a project'.

2. In reply the Ministry stated that 'the revised estimates are under the consideration of Government in the light of consultation with the Ministry of Finance on an appropriate equity-debt ratio for this project and formal sanction in regard to revision to the project estimates has not yet been issued. As soon as a decision is taken, an early opportunity would be taken to inform the Parliament about the final revision to the project estimates. However, Parliament have been kept informed about the likely revision in the cost estimates of BSL. In this connection, attention is invited to Rajya Sabha Unstarred Question No. 429 dated 2-3-1970, Lok Sabha Starred Question No. 708 dated 31-3-1970, and Lok Sabha Unstarred Question No. 5450 dated 7-4-1970'.

3. The Committee regret to note that the revised estimates of Bokaro Steel Ltd., which were forwarded to Government for approval on 10-1-1970, have not yet been approved by Government. The delay of about two years in sanctioning the revised estimates can hardly be justified. They desire that the revised estimates should be sanctioned early. The Committee apprehend that in case of any further delay in sanctioning the revised estimates the Government may be constrained to revise them further in view of progressive escalation of the costs.

4. The Committee are also not satisfied with the plea of the Ministry that Parliament had been kept informed about the likely revision in the cost estimates of Bokaro Steel Project through replies to questions in Lok Sabha and Rajya Sabha. They would like to observe that this is hardly a method to keep Parliament informed. The Government should follow a regular

method of keeping Parliament informed about major revisions in project estimates of public undertakings through statement in Parliament suo moto **and not wait for some Members of Parliament to put questions to elicit such information.**

B. Delays in Construction

Recommendation (S. Nos. 13 & 52, paras 4.8 and 7.12-7.13)

5. In para 4.8 of their 68th Report (1969-70), the Committee pointed out that 'as a result of the delay in the completion of the stage-I by 27 months, the Committee very much regret to note that the losses amounting to Rs. 32 crores on account of production and establishment cost at the rate of Rs. 25 lakhs per month which will in 27 months amount to Rs. 6.75 crores have become unavoidable. It may, however, be noted that if the target date of completion of June, 1973 is not adhered to the loss will be still more. The main reasons for these losses are primarily due to the belated submission of technical data, drawings, cranes, delay in civil engineering work and supplies from private and public undertakings. Apart from these the Secretary of the Ministry has also admitted during evidence that "there have been some organisational failures on the part of BSL," which failure is also responsible for the above mentioned losses. The Committee were informed that steps have now been taken to remedy those organisational failures by adopting a system of network analysis by Dasturco which will show up the deficiencies at various points and which will also show how particular deficiencies can be bypassed, if necessary. In spite of the fact that Dasturco advocated the adoption of the modern techniques of planning by BSL as early as 1966, the Committee regret to note that the management at that stage ignored his advice and as a result the avoidable organisational failures crept into the management of BSL'.

6. In reply the Ministry stated that 'M/s. M. N. Dastur & Co. (P) Ltd. had not specifically proposed the adoption of a system of network analysis as claimed by them but had proposed inclusion in their contract of a general clause conferring on them the responsibility to check the progress and to point out if the progress did not appear satisfactory. Such a clause would have virtually made them the principal consultants. This could not be accepted as the Soviets were the principal consultants in accordance with the Inter-Governmental Agreement. Bokaro Steel itself had taken initiative as early as 1967 to devise means for the application of network planning and scheduling to the construction of Bokaro Steel Plant. A management group of experienced personnel from the Planning Commission was invited to assist in developing a master network. A suitable nucleus was developed within the company under a Deputy Chief Engineer to work on this. As the work developed, the need for further expanding this set-up was recognised and it was also realised that updating of the networks had to be computerised to keep the networks uptodate. It was also felt that for the increased work, the assistance of an outside agency could also be usefully employed. It was in this context that the services of Dasturco were secured under a contract entered into with them in February, 1970. It may, however, be added that Dasturco are not exclusively responsible for this work but are only sharing a part of the responsibilities. BSL continues to be responsible for collecting the data for preparation of preliminary network, checking the networks prepared by Dasturco, provide computer facilities for data sheets prepared by Dasturco, assist Dasturco in the periodical review of network and in the issue of schedules by furnishing the necessary data.

7. As already explained, the postponements of the construction schedule from time to time have been due to factors largely beyond the control of BSL'.

8. The Committee are not satisfied with the reply furnished by the Ministry. They would like to point out that it was admitted by the Secretary of the Ministry, during the course of evidence before the Committee, that there had been some organisational failures on the part of BSL. He also informed the Committee that recently they had decided to adopt a system of network analysis by M/s. Dasturco which will show up the deficiencies at various points and will also show how particular deficiencies could be by-passed, if necessary. In view of this it is difficult to agree with the view of the Ministry that 'a general clause in the contract with M/s. Dasturco conferring on them the responsibility to check the progress of work and to point out if the progress did not appear satisfactory would have virtually made them the principal consultants and this could not be accepted as the Soviets were the principal consultants'.

The Committee would reiterate that the delays in constructions had been to some extent due to organisational failures on the part of Bokaro Steel Ltd., as admitted by the Secretary of the Ministry in evidence before the Committee.

C. Inclusion of delivery schedules in the contracts for plant and machinery

Recommendation (S. Nos. 18 and 48, paras 4.33-4.34 and 7.5)

9. In para 4.34 of their 68th Report (1969-70), the Committee expressed their surprise over the fact that 'in respect of equipment supply, the contract with USSR stipulated only an overall period of fifty months for the supply of equipment, from the date of signing the contract and did not include a phased delivery schedule. The result was that while on the one hand the supplies were deficient to the extent of 10,000 tonnes for the first blast furnace complex, a large number of items of rolling mills required much later have already been supplied.

10. In order to ensure the supply of equipment in time and in the proper sequence required for construction and erection it was essential to include component-wise phased delivery schedule in accordance with the needs of the project. The Committee could get no satisfactory explanation for this omission in the contract entered into with the Soviet suppliers and would like it to be investigated into and responsibility fixed for such a vital omission which has caused considerable loss'.

11. In reply the Ministry stated that when in May, 1966, the contract with the Soviet suppliers for supply of equipment and materials was concluded, the detailed construction schedule had not been finalised except the broad decision that stage-I of the plant including cold rolling mills would be completed by the end of 1970. A detailed construction schedule providing for the commissioning of the different units of the plant was finalised only in January, 1967. Accordingly, the component-wise delivery schedule in the contract with USSR could not have been indicated in May, 1966. This was also not considered very important as the Soviets were themselves the principal consultants and were equally responsible for ensuring that the supplies from their side were made in time to make it possible for the plant to be commissioned as per schedule.

12. The Committee are unable to agree with the view of the Ministry that component-wise delivery schedule for the supply of plant and equipment by the U.S.S.R. was not considered very important as the Soviets were themselves the principal consultants and were equally responsible for ensuring that the supplies from their side were made in time to make it possible for the plant to be commissioned as per schedule. In the absence of proper delivery schedule in a contract it becomes difficult to take any action against the suppliers for any default in making supply of equipment in time and in proper sequence in accordance with the needs of the projects. The Committee, therefore, recommend that such delivery schedule should invariably be included in all the contracts with the suppliers of plant and machinery.

13. The Committee also desire that due vigilance should be exercised and constant efforts made to ensure that supplies are made in accordance with the stipulated delivery schedule irrespective of the fact whether such a schedule forms part of the contract or not.

D. Appointment of Chairman

Recommendation (S. Nos. 34-37 and 49)

14. In paras 5.15 to 5.27 of their 68th Report (1969-70), the Committee commented upon the appointment of Shri N. N. Wanchoo, the then Secretary of the Ministry of Iron & Steel as the Chairman of Bokaro Steel Ltd. and his continuance as Chairman even after his transfer as Secretary to the Ministry of Industrial Development and Company Affairs.

15. In reply the Ministry have sought to justify the appointment of the Secretary of the Ministry as Chairman of B.S.L. *inter alia* on the ground that it was considered to be advantageous to have the Secretary as Chairman of the new Company in its initial stages. It has also been stated that even after the transfer of Shri Wanchoo to the Ministry of Industrial Development and Company Affairs, considering his past association with the project, it was not considered advisable to relieve him of his appointment as Chairman of B.S.L. particularly when the project was in its crucial stage of construction.

16. The Committee are not satisfied with the replies furnished by the Ministry. Most of the points mentioned in the reply had been taken into consideration by the Committee before coming to their conclusion. The Committee would therefore reiterate their recommendation and desire that the following recommendation of the Administrative Reforms Commission which has been accepted by Government in respect of industrial undertakings, should be strictly followed :—

"No Officer of a Ministry should be made Chairman of a public undertaking nor should the Secretary of the Ministry be included in its Board of Management."

E. Techno-economic study of Bokaro Steel Plant after its expansion to 4 million tonnes

Recommendation (S. No. 39, para 6.12)

17. In para 6.12 of their 68th Report, the Committee observed that 'in order to take advantage of the economics of the large scale production, the Government decided to have a steel plant at Bokaro with a capacity of four million tonnes. However, they decided to put up this capacity in two stages

and stage one was of the capacity of 1.7 million tonnes. The Committee were very much perturbed to find that the benefits of the scale of production will not be available to the country even at four million tonnes production. From the camparison of cost of production as shown in para 6.5 of the report it will be seen that the cost of production per tonne in all categories of the final products at 4 million tonnes stage is higher than the cost of those items produced by Rourkela whose capacity is only 1.8 million tonnes. Thus, the Committee are unable to find what advantage accrues to the nation by installing a big capacity unit. The ultimate criteria in deciding the size of the unit could only be the cost of production per tonne. If these comparative prices given are correct then the Committee feel there is no justification in having a 4 million tonnes capacity plant in Bokaro. The Committee feel that the economies of scale at Bokaro should compensate even a slightly higher capital investment per tonne of installed capacity. The Committee, therefore, strongly recommend that a proper and a thorough techno-economic study should be immediately made with a view to remedy the situation so that the nation could have full advantage of the scale of production and get steel at cost comparable to Rourkela if not lower. This techno-economic study should be made by full qualified technical men and economists available in the country whether in Government and public sector or private sector or outside. The Government should also not feel shy to take the advice wherever it may be available whether inside the country or outside the country in order to improve the technology and economics of the Bokaro project'.

18. In their reply the Ministry have stated that "the Government's decision to limit the initial capacity of the plant to 1.7 million tonnes stage was based on availability of resources. It has already been decided to expand the plant to the capacity of 4 million tonnes. The comparative costs of production of 4 million tonnes stage of Bokaro and Rourkela's 1.8 million tonnes stage furnished to the Committee were tentative. The CE&DB of HSL who have been appointed as principal consultants for Bokaro stage-II, have already undertaken the profitability analysis on the basis of the revised project estimates and the current cost of raw materials, services, labour, etc. However, it may be added that Rourkela Steel Plant was built some years ago and therefore, naturally the capital cost on a comparative basis was less in Rourkela. Since then apart from normal escalation in the case of Bokaro mainly due to greater dependence on indigenous supplies of equipment, the effect of devaluation, increase in import duty, etc., have considerably raised the costs. As far as product costs are concerned, these depend on a variety of factors, apart from the fixed costs, such as specification and cost of raw material, quality of steel manufactured, etc. For comparison, all these factors have to be considered on identical basis.

As has been stated earlier, the estimates of capital cost of the 4 million tonnes stage, and the profitability analysis are being worked out by the company's consultants, and a clear picture would emerge after the study is completed."

19. The Committee desire that the study undertaken by the Central Engineering and Design Bureau of H.S.L. should be completed early so that a clear picture might be available about the economics of the project. The Committee feel that such a study should have in fact preceded any decision about expansion of the size of the plant to 4 million tonnes. The Committee urge that the result of the study and Government's conclusion thereon should

be specially placed before Parliament so that Members have a chance of scrutinising the implications and raising the discussion on the subject if necessary.

F. White paper on three new Steel Plants

Recommendation (S. No. 56, para 7.18)

20. In para 7.18 of their 68th Report, the Committee observed that 'Government have already announced a decision to set up three more steel plants at Visakhapatnam, Hospet and Salem in the public sector. Comprehensive details about these proposed steel plants have not been made public. The Committee recommend that Government should without delay bring out a comprehensive White Paper containing essential information about the size of the plants, the capital investment involved, the product-mix and the rationale thereof, and in particular the economies and profitability of each of the plants. The Committee need hardly stress that the White Paper should be prepared most carefully so as to give precise and realistic estimates of vital factors which have a bearing on the working of the steel plants so that Parliament and public have clear idea of the resources which are being committed to these plants and the benefit which would accrue to the country therefrom. The Committee expect Government to take specific approval of Parliament to the setting up of these plants which are expected to play a crucial role in the development of economy of the country.'

21. In their reply the Ministry have stated that Government's decision on the setting up of a special steel plant at Salem in Tamil Nadu, and an integrated steel plant each at Hospet in Mysore and at Visakhapatnam in Andhra Pradesh was announced by the Prime Minister in the Lok Sabha on April 17, 1970. Following this decision, a number of Committees were set up for the selection of the project sites and supply of raw materials to all the three projects. The raw material sources have thus been identified for each project. Government have accepted recommendations of the site selection committee in respect of all the three projects—Toranagalu for the Hospet project, Balachoruvu for the Visakhapatnam project and a site in the northern flanks of Kanjamalai Hill for the Salem project. A steering committee under the chairmanship of Secretary, Steel and Heavy Engineering has also been constituted to keep a close watch over the progress of work in respect of the three new steel plants.

22. The preparation of the techno-economic feasibility reports for a 250,000 tonne special steel project at Salem and a 2 million tonne integrated steel plant at Visakhapatnam was entrusted to M/s. Dasturco on 27-2-1971. Their report for Salem steel plant had been received. This was under examination. The feasibilities report on Visakhapatnam Steel Plant was expected to be received only by the middle of February, 1972.

The preparation of the techno-economic feasibility report for 2 million tonne integrated steel plant at Hospet was entrusted to the CE&DB of HSL on 25-2-1971. Their report was expected by the middle of February, 1972.

23. The Ministry also informed that 'the Government are fully in agreement with the recommendation of the Committee that specific approval of Parliament should be obtained for setting up of the new steel plants. In the case of three new steel plants in the Southern region, such specific approval of Parliament was obtained through a token supplementary grant obtained in

November, 1970. Expenditure of small magnitude on preliminary items in the nature of infrastructure such as land development, water and power connections, are being incurred during the current year and with Parliament's approval. The nature of the items on which such expenditure is being incurred has been explained in the notes on important projects and schemes circulated as supplement to the Demands for Grants for 1971-72. Fuller information in regard to capital cost, product-mix, financial and economic returns on the investments, etc., in respect of each of the plants would be furnished to Parliament in due course and substantial expenditure on the factory premises, equipment and machinery, etc., would be incurred only with the specific approval of Parliament (*i.e.* when the Demands for Grants for the Department of Steel are discussed and voted)'.

24. As regards the proposal to bring out a white paper in respect of the three Steel Plants, the Ministry have informed that it is proposed to incorporate all the relevant details in respect of the three new Steel Plants in the Annual Report of the Ministry of Steel and Mines (Department of Steel) for the year 1971-72. Government have however, accepted the suggestion for the preparation of a white paper in respect of new projects to be taken up in the Fifth Plan period. This would be brought out at the appropriate time.

25. The Committee are unable to agree to the suggestion of Government. They would like to reiterate that after the receipt of the techno-economic feasibility reports in respect of the three new steel plants at Salem, Hospet, Visakhapatnam, Government should bring out without delay a comprehensive white paper containing all essential information in respect of these plants as suggested by them in para 7.18 of their 68th report.

CHAPTER II

RECOMMENDATIONS THAT HAVE BEEN ACCEPTED BY GOVERNMENT

Recommendation (Serial No. 10)

The Committee recommend that along with the Demands for Grants each year Government should present to Parliament a review on each public undertaking giving a true picture about its working. In the case of public undertakings under construction such a review should also include the original estimate of capital expenditure, the expenditure incurred so far and the percentage of work completed, the estimated increase, if any, from the original estimates and the reasons for variations, etc.

(para 3.41)

Reply of Government

While the recommendation of the Committee is noted, it may be stated that the Annual Reports of the Board of Directors of BSL, placed before the Parliament along with the reviews of the Government thereon gives all the details asked for by the Committee, *i.e.*, the progress of construction work, the expenditure incurred and estimates of capital expenditure. If any change in the project estimates is envisaged, this is also reported.

[Ministry of Steel & Heavy Engg. O.M. No. B-25(8)/70 dt. 24-4-71]

Further information called for by the Committee

Please intimate the action taken by Government on the following recommendation of the Committee :

"The Committee recommend that along with the Demands for Grants each year, Government should present to Parliament a review on each public undertaking giving a true picture about its working."

[L.S.S.O.M. No. 12-PU/70 dated 15-9-71]

Reply of Government

The Bureau of Public Enterprises, Ministry of Finance, has already issued instructions that along with the budget proposal regarding additional investment in the form of equity or loan, information on production achievement in physical terms together with a comparison of the level of the previous years production, etc., would be incorporated in the budget/supplementary demand documents. In this connection, a copy of their D.O. No. 46/Adv.(F)/BPE/68-22 dated 13-11-1968 is attached (Appendix I).

2. Besides, furnishing the information on budget document, Bureau presents to Parliament a comprehensive report on the performance of public enterprises and the enterprises registered under the Companies Act, and incorporated under the provisions of Acts passed by Parliament. The Ministries are also required to place on the Table of both the Houses the annual audited Balance Sheet and Profit and Loss Account and the Annual Report of each undertaking under their control, along with Government's review, which also

provide opportunities to the Parliament to review the performance of these enterprises. A note on important schemes is also included with the Demands for Grants presented to Parliament each year and the Annual Report of the Ministry also give the review of each public undertakings under the Ministry.

[Ministry of Steel and Mines, Department of Steel, O.M. No. B-25(5)/70 dated 24-12-1971]

Recommendation (Serial No. 11)

The Committee find that the Minister for Steel in reply to a question No. 429 dated 2-3-1970 in Rajya Sabha and in reply to a question 708 dated 31-3-1970 in Lok Sabha had stated that the total investment of Bokaro on stage-I was now estimated to be of the order of Rs. 760 crores which means the Government considers that the total investment on Bokaro will go up by about Rs. 90 crores above the earlier estimates of Rs. 670 crores as reported to the Parliament vide Demands for Grants 1967-68 on the basis of which approval for the establishment of Bokaro plant was taken. From the examination of the BSL and the data that have been furnished to the Committee, they are convinced that even this figure of Rs. 760 crores as reported to the Parliament by the Minister may not be a firm figure.

Wide variations between the estimated cost and the actual expenditure has become a common feature in the public sector projects. The Committee would, therefore, watch with considerable anxiety as to how in the ultimate analysis the actual cost compares with the estimated cost in the case of Bokaro both for stage-I and II.

(Paras 3.42-3.43)

Reply of Government

In a large sized project, the construction of which is spread over a number of years, the effect of escalation on material and labour cost is difficult to forecast. In the estimates first prepared, it was indicated by way of a note that no provision for escalation had been made. Over the past few years the prices have shown an upward trend for a variety of reasons, and this is something which is not within the control of the project. The cost of steel has increased considerably since 1966, when the project estimates were prepared. The labour cost has also considerably increased. A revision of the project estimates has been necessitated by a substantial increase also in the actual figures as well as escalation in the cost of indigenous equipment, and raw materials. The project maintains a close watch on the cost effect of such increases. Despite this, when large cost increases become inevitable due to reasons which are not controllable, the estimates have to be revised realistically.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971]

Recommendation (Sl. No. 15)

The Committee further desire that Government should ensure that other public undertakings who have to supply machinery and equipment to BSL adhere to the time schedule. It should also be ensured that they do

not keep on escalating prices which would inflate greatly the cost of the product and upset the economics of the Bokaro steel plant.

(Para 4.10)

Reply of Government

The deliveries of equipment and materials by the public sector undertakings are being reviewed at frequent intervals not only by BSL but also at Government level. Where necessary, orders are being sub-contracted to suitable Indian production agencies, or are being allowed to be imported. Defaulting firms are also being continuously pressed by senior officers in the Ministry to keep to their schedules.

The management of MAMC has been strengthened recently and better industrial relations have been secured.

The contract prices are firm except as indicated below :

1. Heavy Electricals, Bhopal	The prices are subject to statutory increases in respect of rates of exchange customs, counter-veiling duties and excise duties.
2. Bharat Heavy Electricals, Hyderabad	The variation is due to change in customs duty and rate of exchange applicable to imported components.
3. Instrumentation Ltd., Kota	Escalation towards labour charges only after 30-6-1973, would be admissible.
4. Mining & Allied Machinery Corporation, Durgapur	Contract to be finalized.

Government are fully conscious of the importance of ensuring the timely supplies of machinery and equipment to Bokaro by public sector undertakings. It is for better coordination for this purpose that heavy engineering units including HEC and MAMC were transferred in March, 1969 from the Ministry of Industrial Development to the Steel Ministry.

[Ministry of Steel and Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971]

Recommendation (Sl. No. 21)

The Committee regret to note that as against the target of 11,672 tonnes of equipment to be supplied by the public sector undertakings upto 31-7-1969 the equipment actually received was only 6,101 tonnes, i.e., 52 per cent. of the target fixed. In the case of HEC as against 72,415 tonnes to be supplied in all, the actual deliveries upto the end of January, 1970 have been only 10,840 tonnes.

The Committee also view with concern that there had been delays in supplies from HEC even with reference to the revised schedule prepared in November, 1968. During evidence the Secretary of the Ministry of Steel and Heavy Engineering admitted that "the delays in HEC were due to their own organisational deficiencies. There are some instances where supplies from USSR were delayed but the major portion of delays has been due to their own faults. Unfortunately that is true."

The Committee were, however, assured that in pursuance of the recommendations of the Committee on Public Undertakings (1967-68) in their 14th Report on HEC, a study of the working of the Corporation was made by a technical team comprising officers of the Bureau of Public Enterprises and the Directorate General of Technical Development. Corrective measures were being taken to remove the deficiencies pointed out in their report. The Committee trust that effective steps will be taken by the HEC to ensure that the supplies to Bokaro plant are made in accordance with the sequence and schedules desired by them.

(Para 4.48-4.49)

Reply of Government

The supplies from the public sector undertakings, other than HEC and MAMC, have considerably improved. Out of 9,072 tonnes ordered on them, 5,147 tonnes had already been received till January, 1971. The deliveries are broadly in keeping with the required schedule.

The reasons for delay in supplies from HEC have been briefly given under replies to sl. No. 20 (para 4.47), while that in the case of MAMC have been given in the reply to sl. No. 22 (para 4.20). As indicated therein some organisational changes have already been made in HEC and an appraisal of the organisation and working of HEC and MAMC and their capacity to cope with the challenging responsibilities is being continuously undertaken by the Ministry to improve their performance to the desired levels.

[Ministry of Steel and Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971]

Recommendations (Sl. No. 24)

The Committee find that the deliveries from the private sector suppliers are also not according to the schedule of delivery. BSL has generally explained that this is due to non-availability of steel and imported components. The BSL and the Ministry should ensure that the private sector companies who are to supply equipment/material to BSL get timely releases and the import licences as the case may be so that the programme of construction of Bokaro may not be held up.

(Para 4.54)

Reply of Government

BSL has already taken steps to assist the private sector companies, who are to supply equipment and structures to Bokaro, in getting timely supply of steel and in obtaining licences for imported components. Besides recommending the applications of its fabricators/suppliers to appropriate authorities for issue of priorities for steel in their favour, BSL is also now issuing steel to fabricators/suppliers for matching sections out of its own buffer stock built up by import and procurement from indigenous sources. This has already led to some improvement in the position. There was difficulty in getting plates of IS : 2062 quality and also manganese and alloy steel plates from indigenous producers. Import has been arranged from time to time of these plates from USSR. As a

result of these measures and also some relaxations agreed to by the Soviet consultants on the use of killed quality steel conforming to IS : 2062 for welded structures which are subject to dynamic lead, the position has considerably improved. A regular steel cell has been organised for procurement of steel.

Besides the assistance in the procurement of steel and imported components, effective follow-up by the company's inspection and progress department is also yielding good results.

[Ministry of Steel and Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971]

Recommendation (Sl. No. 27)

The Committee would also like that the Department/Ministry concerned dealing with refractory industry should take note of the complaints and the observations made by the BSL in the matter of certain shortcomings and failures on the part of the refractory manufacturers. The technical wing of the concerned Ministry should appoint a committee to look into these matters to focus the weaknesses and to take necessary remedial measures so that the needs of the steel industry is fully and adequately met through indigenous sources of supply.

(Para 4.67)

Reply of Government

The Government have taken due note of the complaints and observations made by BSL in regard to shortcomings and failures on the part of the indigenous manufacturers in meeting the requirements of refractories for Bokaro.

To plan the production of refractories to fit in with the steel development programme, Government have appointed a committee to examine this problem in all its aspects and make suitable recommendations. The terms of reference of the committee are as follows—

(a) To make a quantitative estimate of the requirements of different categories of refractories, by type and quality, needed by the steel industry in the next 15 years both for maintenance and construction purposes;

(b) To assess the existing installed capacity in the country for the manufacture of different categories of refractories to analyse reasons for shortfalls in production and to suggest suitable measures to raise the production to the level of rated capacity;

(c) To examine and recommend the extent of additional capacity that should be set up, and in what stages, to meet adequately the needs of the steel industry as a whole in next 15 years, the number and optimum size of the units required, the relative economics of setting up new units *vis-a-vis* increasing the capacity of existing units or reviving units which have closed down for various reasons, and the extent to which new units should be set up in the public sector either as captive units or otherwise;

(d) To assess the capacity available in the country for manufacture of plant and equipment needed for the manufacture of refractories and recommend suitable measures to meet the likely demands for each equipment;

(e) To examine the scope of standardisation in the specifications for refractories and to make suitable recommendations; and

(f) To assess the availability of the resources of raw materials such as magnesite, chromite, bauxite, etc., to support the development of refractory industry in the country; and

The committee is expected to submit an interim report by April, 1971, which will be followed by the full report later.

[Ministry of Steel and Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971]

Further information called for by the Committee

In their reply the Ministry stated that to plan the production of refractories to fit in with the Steel development programme, Govt. appointed a Committee to examine this problem in all its aspect and make suitable recommendations. The Committee as expected to submit an interim report by April, 1971 followed by the full report later. Has the Committee submitted its interim/final report? If so, please furnish copies of the Report and the action taken of the Government.

(L.S.S. O.M. No. 12-PU/70, dated 24-12-1971)

Reply of Government

The Committee on Refractories has since submitted a Report (Part I) to the Department of Steel in November 1971 covering an analysis of demand, availability, surplus/deficit of various qualities of refractories for the period 1971 to 1985. This Report is under the examination.

2. Further, reports covering an analysis of availability of raw materials for the refractory industry, standardization of refractories and the equipment requirements of the industry are expected to be submitted by March 1972.

[Ministry of Steel and Heavy Engineering O.M. No. B-25(8)/70 dated the 24h April, 1971]

Recommendation (Sl. No. 28)

The Committee were informed that due to the failures of the Indian refractory manufacturers to meet the demands of Bokaro, the Government was considering of putting up a refractory plant in the public sector. The Committee do not understand why this was not considered early enough to obviate imports. On the other hand, the Indian Refractory Makers' Association represented to the Committee that the industry has adequate total installed capaciy to meet the requirements of the steel industry based on the present pattern of demand for different qualities. All that they want is that operational and constructional requirements should be planned well in advance to enable them to organise production. The Committee feel that before the Government takes a decision to put up

a refractory unit in the public sector, a proper enquiry must be made about the existing surplus capacity and the technical competency of the existing units and only after making a thorough study of the economics of the project they should go in for a refractory project in the public sector.

(Para 4.68)

Reply of Government

The Government have already decided to set up a refractory plant in the public sector at Bhilai with a capacity of 100,000 tonnes after due consideration of the installed capacity of the refractory units in the private sector and economics of this project. The question whether Bokaro steel plant should have its own captive refractory plant is also under consideration and a decision will be taken only after a careful examination of all the relevant considerations.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971]

Recommendation (Sl. No. 29)

The Committee are surprised to note that although we have spent nearly Rs. 3,500 crores on public enterprises and even after a lapse of 20 years, the Government have not yet evolved a clear concept about the constitution and composition of the Board of Directors for public enterprises. The Govt. have said that "the whole policy regarding the selection of right persons to serve as a part time directors in the public enterprises is under the review at the moment." To a question as to what are the factors that are kept in view for the appointment of Board of Directors, the Secretary of the Ministry stated at the time of evidence "I suppose that factor is to have persons of standing who have experience of a number of industries and therefore their advice is regarded to be very valuable."

The Committee consider that the Board of Directors of a project of the dimensions of Bokaro should include a team of functional directors, which team may be jointly held responsible for the proper execution of the project. Then, there should be an element of heirarchy in this functional team included in the Board of Directors so that the Government does not get at the loose-end whenever the chief executive of the project (Managing Director and/or Chairman) retired or resigns.

There is still another element in the constitution and functioning of the top management like the Board of Directors which is now being increasingly adopted and that is that the functional directors operate as constellation, *i.e.*, as a closely integrated and a knit team.

The Board of Directors should be so constituted that if the top man goes for any reason, a person from within the project, who has the necessary experience and background of the project and who is conversant with the problems immediately steps in to take the place. In a project of the dimension of Bokaro to import a new man whenever a vacancy occurs will always result in set backs because the new incumbent will take his own time to get familiarised with the problems.

(Paras 5.8-5.10)

Reply of Government

The plant is at present in the construction stage and the question of appointment of functional directors as also introducing an element of heirarchy therein will be considered at the time when the plant is to go into the operation. The Board as constituted includes Technical Director of HSL as also Chairman of HEC and their association has been found to be of great help in dealing with day-to-day matters. Sri Sondhi, who was the Managing Director, is now functioning as Chairman and Managing Director of the company.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971]

Recommendation (Sl. No. 31)

As regards non-official element in the Board of Directors the Committee find that their number was three in the previous Board out of a total of eight which has now been reduced to one in the existing board of 10 directors. The Committee feel that it is useful to have non-officials on the Board but only one such director is not sufficient.

The Memorandum of Association provides that the maximum of directors of the board would be twelve. The Committee feels that it will be useful to have at least fairly good proportion of the members of the Board from among non-officials.

(Para 5.12)

Reply of Government

This recommendation has been noted for compliance. The Board of Directors of BSL for 1970-71, as reconstituted, includes out of 10 directors 5 non-official directors (including 2 from HSL and 1 from HEC).

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971]

Recommendation (Sl. No. 32)

The Committee are not happy at the selection of the non-official directors firstly purely from the angle that they have not been taking interest in the affairs of the company as is evident from the fact that the two non-official directors (Sri N. M. Wagle and Sri K. Srinivasan) attended only about 50% of the meetings during the last three years. One of them appears to be a professional director being on the board of 24 companies. It is also understood that he is a retired member of the ICS. The Government will do better if they give more thought to the selection of the non-official directors and make sure that only such persons are nominated who have really a wide sweep of experience of industrial management of really big concerns of the type and the magnitude of Bokaro, the criteria, which the Secretary of the Ministry has himself stated, ought to be in the nomination of the directors. The Committee find to their regret that this criteria as stated by the Secretary has not been taken care of while making the nominations to the Bokaro Board.

(Para 5.13)

Reply of Government

The criterion in the nomination of Directors as clarified by the former Secretary of this Ministry before the Committee, has been taken care of while making appointments on the Board for the year 1970-71 (whose tenure will continue till the next Annual General Meeting of the company).

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971]

Further information called for by the Committee

The present composition of the Board of Directors of Bokaro Steel Plant and the qualification experience of the Members of the Board may be intimated (L.S.S. O.M. 12-PU/70 dated 15-9-1971).

Reply of Government

The composition of the Board of Directors of Bokaro Steel Ltd. before the 7th Annual General Meeting of the Company held on 25th September, 1971, was as follows :—

1. Shri M. Sondhi, Chairman and Managing Director.
2. Shri J. C. Luther, Director, Ministry of Steel & Mines, Deptt. of Steel.
3. Shri N. R. Reddy, Joint Secretary, Ministry of Finance, Deptt. of Economic Affairs.
4. Shri S. S. Mukherjee, General Manager, South Eastern Railway, Calcutta.
5. Shri R. P. Billimoria, Director (Personnel), Hindustan Steel Ltd.
6. Shri B. Appu Rao, Director (Production), Hindustan Steel Ltd.
7. Shri R. S. Mandal, Chief Secretary, Govt. of Bihar.
8. Shri S. K. Nanavati, Managing Director, Tisco, Jamshedpur.
9. Shri B. N. Khosla, Ex. Director, Guest, Keen and Williams Ltd.
10. Shri S. S. Jagota, Chairman, Heavy Engineering Corporation.

The Articles of Association of the Company provides that after every Annual General Meeting of the Company, all the Directors, excepting the Directors representing the administrative Ministry, the Ministry of Finance, and Chairman and Managing Director of the Company, shall retire. The retiring Directors shall be eligible for reappointment. The Board is being reconstituted.

[Ministry of Steel & Mines, Deptt. of Steel, O.M. No. B-25(8)/70, dated the 16th October, 1971]

Recommendation (Sl. No. 40)

The Committee have also noted that the steel rolling mill size at Bokaro has built-in capacity for going up to 5.5 million tonnes. This built-in capacity should not be put forward as another excuse for not having Bokaro in the 2nd stage as a viable commercial unit.

(Para 6.13)

Reply of Government

The DPR prepared by the Soviet consultants has envisaged Bokaro as essentially a 4-million-tonne plant and it is conceived to be economically viable at that stage. However, the capacities of rolling mills, utilities and other items of general works facility are such as to ensure that the plant could in future develop upto 5.5 million tonne ingot steel, with comparatively smaller investment on coke production and iron and steel making and other auxiliary shops, and in a comparatively shorter period. Meanwhile, to improve profitability of the plant as well as to relieve domestic shortages of steel, a decision has already been taken to achieve an intermediate level of production of 2.5 million tonnes by the addition of the 5th converter of 100 tonne capacity in the steel melting shop and allied facilities soon after, if not alongwith the commissioning of the 1.7 million tonne stage, and in any case before the end of the 4th Plan.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971]

Recommendation (Sl. No. 41)

The Committee have been told that stage one, i.e., 1.7 million tonnes production stage will never be viable unit and BSL will continue to incur loss on this stage of production on account of built in capacity with a capital cost of Rs. 4,000 per tonne on the basis of Rs. 670 crores estimates. The Committee are perturbed to learn that BSL will continue to lose Rs. 20 crores per annum during the first stage of production till it reaches 4 million tonnes production. Even if a decision is taken to go in for 4 million tonnes production it will take 4 years to reach the second stage. Thus, the Committee have noted that the project is deemed to incur a loss of Rs. 80 crores. Therefore, the compulsion of the situation obliges that Bokaro reaches 4 million tonnes production stage at the earliest in order to contain these losses. The Committee note that the Government have already taken a decision to go in for 4 million tonnes expansion immediately. The Committee would, however, like to emphasise and caution that there is imperative need for a proper techno-economic reappraisal in order that the 4 million tonnes stage becomes really a profitable venture. The Committee would like the Government to take lessons from the first stage of construction so that mistakes committed in the first stage are not repeated. Then alone it is worthwhile taking a decision to go in for expansion for 4 million tonnes.

(Para 6.14)

Reply of Government

The project has all along been conceived as a 4 million tonnes plant with provision for further expansion. From the point of view of availability of financial and technical resources, an intermediate stage with a capacity of 1.7 million tonnes of ingot steel and 880,000 tonnes of pig iron was considered. A decision has already been taken to concurrently expand the plant to 4 million tonnes capacity. In implementing the expansion scheme, every effort will be made to narrow down the gap in the completion dates of the intermediate stage and the expanded capacity.

In a project of this magnitude, entailing very heavy investments, the losses at the initial stages are inevitable. The estimate of losses quoted in the para is based on a number of assumptions with regard to the capital structure, cost of inputs and the selling prices and it is possible that the

actual figure may vary, depending on the conditions prevalent at the time of operation.

It should be recognised that in making an appraisal of the project, it is necessary to take into account the overall benefits which will accrue to the economy of the country. The Bokaro steel plant will cover the estimated gap in the domestic supply and demand of flat products in 1975 as well as in 1980. At 90% utilisation of capacity in the 1st stage expected to be reached in 1975-76, the production of flat products from Bokaro will amount to 1.2 million tonnes and at the same percentage of installed capacity, the production will rise to nearly 2.9 million tonnes by 1980-81 in the 2nd stage. According to the latest estimates made by the National Council of Applied Economic Research, the gap in the domestic supply and demand of flat products, without taking into account the production from Bokaro, will be 1 million tonnes in 1975 and 2.54 million tonnes in 1980. Thus, the production from Bokaro will serve to fully meet the domestic demand for scarce and critical categories of flat products and assist the development and growth of other metallurgical and engineering industries. As the deficit in the domestic supply of flat products has to be met from imports, there will be a saving of about Rs. 150 crores per annum in foreign exchange, even at the level of production at 90% of the installed capacity in the 1st stage (1.7 million tonnes). Furthermore, it is estimated that Bokaro will make a substantial contribution to the Central and State Revenues. The yield from excise duties will amount to about Rs. 25 crores in the 1st stage of operations and going upto Rs. 60 crores in in the 2nd stage. The earnings of the Railways from freight will go up from about Rs. 28 crores in 1st stage to about Rs. 54 crores in the 2nd stage. Similarly, the State revenues from sales tax will increase from Rs. 3 crores in the 1st stage to Rs. 7.5 crores at the 2nd stage. Bokaro will also have a substantial impact on employment opportunities in the country. It has been estimated that the strength of manpower will go up from 13600 in the 1st stage to 19100 in the 2nd stage. It has further been estimated that for every job generated in the primary production of steel, nearly 10 new jobs are created in other engineering, mining and transport industries for which steel is an essential and major input. On this basis, the indirect employment to be created as a result of the operations of Bokaro plant is likely to be of the order of about 130,000 in stage I and about 200,000 in stage-II.

For the expansion scheme, the principal consultants of the company have been asked to make a profitability at the 4 million tonne stage, and a final decision on the product-mix, etc., would be taken after a careful analysis of the economics of the project at the 4 million tonne stage.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971]

Recommendation (Sl. No. 42)

The Committee would like to reiterate that there is a need for utmost caution and strict enforcement of economy on expenditure both on construction and operating cost in view of very heavy capital investment per tonne of steel and in view of the heavy losses that are likely to take place in the first stage.

(Para 6.15)

Reply of Government

Noted.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24t4h April, 1971.]

Recommendation (Sl. No. 43)

The techno-economic study suggested by the Committee should also determine the product-mix so that the production at Bokaro will have ready market both in India and abroad and we do not produce items which are not saleable or whose cost may be such that these could not be marketed either in India or in abroad.

(Para 6.16)

Reply of Government

There is acute shortage of flat products in the country and this shortage will continue to exist until the capacity is raised to bridge the gap between demand and supply. The product-mix of the plant was determined based on demand appraisal conducted by NCAER and other agencies. For expansion of the plant to 4 million tonnes stage, the product-mix is being considered from the point of view (a) prevailing shortages in the country (b) savings in foreign exchange; and (c) profitability.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971]

Recommendation (Sl. No. 44)

The Committee feel that the Parliament ought to have been kept informed about the economics of the Bokaro in the first stage and the Government ought to have taken the Parliament into confidence about the losses that were likely to be suffered during the first stage. The Committee find that the BSL and Ministry were fully aware from the beginning that Bokaro at the first stage would incur losses. This fact ought to have been brought specifically to the notice of Parliament. The Committee would suggest that in future whenever big plants are set up in stages the financial implications about profit/loss in each stage should be brought to the notice of Parliament while obtaining their approval for setting up such plants.

(Para 6.17)

Reply of Government

The DPR was prepared for a four million tonnes plant. The report contained cost estimates of products at this capacity. For the intermediate stage, the products cost estimates were not initially worked out as the plant was essentially conceived as a 4 million tonnes plant. The project cost estimates for the first stage were considered by the technical committee appointed to examine the project report. The committee in its report has indicated that due to high built-in capacities in the first stage the product cost would be higher and this being only an intermediate stage, the economics of the plant will improve when the built-in capacities are fully utilised.

Bokaro has since worked out tentative profitability estimates for stage-I. These estimates are, however, subject to number of assumptions. As soon

as the position regarding some of the basic assumptions are clarified, Parliament would be suitably informed.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971]

Further information called for by the Committee

Please intimate the action taken on the following recommendation of the Committee :—

> "The Committee would suggest that in future whenever big plants are set up in stages, the financial implications about profit/loss in each stage should be brought to the notice of Parliament while obtaining their approval for setting up such plants."
>
> [L.S.S. O.M. No. 12-PU/70 dated 15-9-1971.]

Reply of Government

Government agree with this recommendation in principle. Under the current procedure specific approval of Parliament is obtained for setting up of the plants as also for their expansion, through Demands for Grants, which are subject to the vote of Parliament. The economics of the project and the financial implications are also displayed in the Notes on important schemes circulated as supplement to the Demands for Grants, whenever necessary. An endeavour will be made in future to indicate in the case of multistage projects the economics of various stages individually and of the project as a whole.

[Ministry of Steel and Mines, Department of Steel, O.M. No. B-25(5)/70 dated 24th December, 1971]

Recommendation (Sl. No. 45)

The Bokaro steel plant was conceived in 1957 when Government asked Hindustan Steel Limited to take preliminary steps for the installation of the new steel works at Bokaro and it will not be before June, 1973 that the construction of 1st stage of the plant is expected to be completed. Thus it will take Government more than 15 years to establish a new steel plant with a capacity of 1.7 million tonnes. Out of this period of 15 years, preliminaries like calling for preliminary project report, detailed project report and settling the question of foreign aid and collaboration took about 8 years and the construction is expected to take about 7 years from the date of signing of contracts with the Soviet collaborators for the supply of plant and machinery.

Such a long period in establishing a new plant can hardly be justified. The Committee desire that Government should give serious consideration to this matter to reduce the time lag in establishing new projects in future.

(Para 7.1)

Reply of Government

The Committee in arriving at the conclusion that it would take the Government 15 years to establish Bokaro plant which is unjustified, has perhaps not given due weight to the basic facts concerning the setting up of this project. Bokaro was not a project included in the second five year plan

and only a token provision had been made for improving the communication to and taking up the preliminary work at the proposed site and also the preliminary project report was commissioned only for purposes of preparing the preliminary details for use in setting up of the project later. It was only in May, 1962 that Dasturco had been asked to prepare the detailed project report for the Bokaro project which had been included in the third five year plan. The search for external financial and technical assistance was also undertaken, but it did not materialize till May, 1964. With the limits imposed by the technological development of the country and unavoidable necessity of foreign financial and technical assistance for setting up of such a big project, the time spent in locating the source of external assistance was also unavoidable. Thus the time involved on implementing this project only from 1964 can reasonably be regarded as the time taken on implementing this project. A period of about two years from May, 1964 to May, 1966 was taken in negotiations with the Soviet authorities and in the finalisation of the DPR. The Committee is aware of the efforts being made to implement the project with maximum possible participation of Indian personnel and indigenous equipment and materials, which are considered necessary in the overall interests of the country and which have unavoidably and not unnaturally led to certain bottlenecks. The benefits of experience gained in implementing Bokaro stage-I are not only to be utilized for implementing the second stage of the project but also in the three new steel plants which the Government have decided to set-up so as to reduce the period required for implementing such projects.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971.]

Further information called for by the Committee

Please intimate the action taken by Government on the following recommendation of the Committee:—

> "The Committee desire that Government should give serious consideration to this matter to reduce the time lag in establishing new projects in future."

[L.S.S. O.M. No. 12-PU/70 dated 15-9-1971]

Reply of Government

It has already been stated in Government's reply *vide* this Ministry's O.M. No. B-25(8)/70 dated the 24th April, 1971, that the benefits of experience gained in implementing Bokaro Stage I, will be utilized for the Second Stage of the Project, and also for the new steel plants to be set up, so as to reduce the period required for implementation of such projects.

2. A decision has already been taken by Government to complete the erection of an intermediate Stage of 2.5 million ingot tonnes by March, 1974, in the course of the Expansion of Bokaro to 4 million tonne stage. A crash programme has been launched to achieve this objective in time. Strict schedules for delivery of individual items of equipment have been laid down and decision for import of certain items have been taken on the basis of realistic estimates of the time required for their supplies from indigenous sources. Advance planning has been done also to procure essential supplies of imports such as steel of various categories and specifications. Organisation and Expertise developed by public sector agencies such as Hindustan Steel Works Construction Ltd. are being fully utilised.

3. The proposals for the setting up of new Steel Plants are being considered and implemented with pronounced emphasis on adherence to firm dates and phased programmes for the completion of various stages beginning with the preparation of feasibility Reports and Detailed Project Reports, involved in the construction of these large and complex projects.

[Ministry of Steel & Mines, Department of Steel, O.M. No. B-25(5)/70 dated the 24th December, 1971.]

Recommendation (Sl. No. 51)

The Committee regret to note that according to the revised schedule that 1st stage of Bokaro will be delayed by about 27 months as compared to the original schedule. Even this revised schedule is subject to various uncertain factors. As a result of delay in construction, the losses amounting to Rs. 32 crores on account of production, and establishment cost amounting to Rs. 6.75 crores have become unavoidable.

The Committee are not convinced that even the revised target dates of completion of 1st stage will be adhered to because of the various uncertain factors that have been brought to the notice of the Committee and if the present completion dates are not adhered to the resultant losses will be more than what has been estimated.

(Para 7.10-7.11)

Reply of Government

The construction work is now proceeding as per the present schedule providing for the completion of erection of first blast furnace by December, 1971 and the entire stage-I by March, 1973. However, as stated earlier, the execution of a project of the magnitude and complexity of Bokaro is not dependent entirely on the project management and even the Government agencies, but is dependent on other circumstances as well. The position as it prevails now is that some delays in supplies of indigenous equipment and refractory persist. The extreme shortage of raw steel from indigenous sources like plates and sheets, rolled sections and even reinforcement steel is posing an equally serious problem. The unrest and lack of discipline in the labour force is also an important retarding factor. In spite of these difficulties, every endeavour is being made to resolve the complex issues with the aim of adhering to the revised construction schedule.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971.]

Recommendation (Sl. No. 53)

The Committee find that there has not been proper thought and urgency shown in the constitution of Board of management and to find a suitable incumbent to replace the Chairman of the company who was also the Secretary of a Ministry and as a result of this dual responsibility, as admitted by the Chairman, BSL himself one of the duties of his dual charge did suffer.

There was no team of functional directors on the Board of Directors. Neither there was any heirarchy in Board so that if the top executive retired or resigned someone from the Board who had the necessary experience and background of the problems of Bokaro would step into to take his place. Each time a vacancy occurred the Ministry got at the loose-end and they

had to find a new man for the post who was bound to take his own time to acquaint himself with the problems which resulted in temporary setbacks. In the appointment of the Board of management, the Committee would like the twin principles of functionalism and necessary managerial heirarchy to be organised in the increasingly accepted context of operating as a constallation.

(Para 7.14-7,15)

Reply of Government

As already explained, this Ministry made efforts to find a suitable successor to Sri Wanchoo, following his appointment as Secretary, Department of Industrial Development. However, in view of his long association with the project and his capabilities, it was not possible to relieve him of the post of Chairman of BSL in the interest of the project, until February, 1970.

As regards the appointment of functional Directors, as already stated before, this will be considered when the Bokaro project goes into production.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971.]

Recommendation (Sl. No. 54)

The other major failure noticed by the Committee was in matter of supplies of equipment from indigenous sources, largely from the public sector undertakings also from the private sector factories. The Committee were surprised to find that inordinate delays took place in settling details of drawings, delivery schedules and the prices from the public sector undertakings particularly HEC and MAMC. Even the revised delivery schedules were not being adhered to by them. The Committee very much regret to note that the Government failed to provide the necessary leadership to arrange this coordination among the public sector undertakings, so that the supplies to Bokaro could be made in time in order that the schedule of the Bokaro was not upset. The Committee hope that in future at least the Government will see that all the supplies which Bokaro has to get from the public sector units are made in time and according to schedules of delivery and at agreed price, and necessary measures are taken so that the Bokaro is not delayed on that account.

(Para 7.16)

Reply of Government

Please see reply to sl. no. 29 & 21 in so far as HEC is concerned, and sl. no. 22 in regard to MAMC.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971.]

Recommendation (Sl. No. 55)

The Committee are perturbed that the estimates of the cost of construction are not only very high for Bokaro, but also are not being adhered to. As against Dasturco's estimate of about 600 crores for 4 million tonnes plant, the capital cost for 1st stage itself for a capacity of 1.7 million tonnes will be Rs. 760 crores as against the original estimates of Rs. 670 crores. The Committee also find that in spite of having a plant with a large capacity which should result in economies of scale the cost of production per tonne

at Bokaro steel plant even at 4 million tonnes stage will be higher than at Rourkela steel plant. This matter deserves serious consideration. The higher cost of production will not only affect the financial viability of Bokaro but high cost steel will adversely affect the entire economy of the country as the production cost of all industries using steel would go up. The Committee, therefore, urge that there is need for a proper techno-economic reappraisal in order that the 4 million stage becomes really a profitable venture. This study should be made by fully qualified technical men and economists available in the country or from outside. The Committee would like that this report together with the Government decision may be laid on the Table of both the Houses so that the Parliament may get an occasion to express itself.

(Para 7.17)

Reply of Government

The CE&DB of HSL, which has been appointed as the principal consultants for Bokaro stage II of 4 million tonne, has undertaken profitability analysis on the basis of the revised project estimates and the current cost of raw materials, services, labour, etc. Their report alongwith the decision of Government thereon would be placed on the table of both the Houses as desired.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971.]

CHAPTER III

OBSERVATIONS/RECOMMENDATIONS WHICH THE COMMITTEE DO NOT DESIRE TO PURSUE IN VIEW OF GOVERNMENTS' REPLIES

Observation

In July, 1964 a delegation was sent to Moscow to hold discussions with the Russians. According to M/s. Dasturco "it was in the capacity of Indian consultants on the Bokaro project that Mr. Dastur was asked to follow the Indian delegation which went to Moscow in July, 1964. During the crucial discussion in Moscow on the scope of Indian engineering a positive stand could have been taken. The absence of such a clear stand perhaps encouraged the Soviets to dictate terms later. During the Moscow meetings it had been agreed that a Soviet Technical Team would visit India for detailed discussions with the consultants on the project. To its surprise, Dasturco was completely kept out of the discussions with the Soviet team which visited India in August, 1964. It was unfortunate that Dasturco was not associated with any of the technical discussions with the Soviets thereafter which had important technical implications and ultimately resulted in a high cost project."

(Para No. 2.13)

Reply of Government

In July, 1964, M/s. Dasturco were not the Indian consultants of the Bokaro project; they were in fact at that time the general consultants to the Steel Ministry. The scope of work of the Indian organisation was defined only in the Inter-Governmental Agreement dated 25-1-1965. During the negotiation for the Inter-Governmental Agreement, the effort was to assign to the Indian organisation as much of the design work as was possible.

Dasurco were fully associated with the technical discussions at Moscow. Later, the Soviet team came to India on a fact finding mission, *i.e.*, to collect data in regard to sources of raw materials, availability of construction material and other data required for preparation of the project report, and to seek clarifications on the information furnished to them. The association of Dasturco in the discussions with the delegation would not have yielded any useful results as Dasturco would have had nothing more to contribute to the information already available in their project report.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971]

Observation

Dr. Dastur stated during his evidence before the Committee that when this technical committee was formed "we objected. We said that a report like that—the Soviet report had come in 28 volumes—had to be scrutinised by a competent body which should sit down with the report and take a few months to go over it and to come out with certain meaning ful conclusions, but that was not the work of a committee; the Committee could only sit on the conclusions of a body which had worked on the report.

But the committee could not scrutinise a report in 28 volumes. However, the purpose was not to have the report scrutinised. The purpose was just to show that there was a committee appointed and have a front."

(Para No. 2.15)

Reply of Government

The statement of Dr. Dastur quoted in this para contains his own observations and is not free from bias. It is not clear as to what is meant by his statement that a report like this had to be scrutinised be a competent body. All project reports of such projects are usually scrutinised by a technical committee consisting of representatives from all interests concerned. The technical committee which examined the Soviet DPR consisted of the former Chief Engineer of the Central Engineering & Design Bureau of Hindustan Steel Limited, who was the then Managing Director of Bokaro Steel Limited, three representatives of the CE&DB, two representatives of M/s. Dastur & Co., three representatives of Bhilai steel plant, two representatives of Rourkela steel plant, two representatives of Durgapur steel plant, two of TISCO, two of SE Railways and one each of HSCL, NMDC, NCDC, Department of Mines & Metals and the DGTD. The committee thus consisted of top representatives of the known steel experts in the country, experienced personnel from the operating steel plants in the public as well as the private sector, agencies which would supply coal and iron ore and also the railways. No project report of a steel plant earlier had been examined by a more broad based technical committee. It is not, therefore, clear how M/s. Dasturco consider this body as not competent. In fact, M/s. Dasturco project report on Bokaro was earlier examined by a committee consisting of six members only, as against 22 in the case of the Soviet DPR. The technical committee also divided itself into sub-committees to examine in detail the different aspects. The technical committee to examine Soviet DPR had continuous sessions during the period it met and the sub-committees constituted by it had also continuous sessions and had the benefit of on the spot clarifications furnished by the experts of the Soviet party, which had sent a team of 30 senior specialists, headed by the Director of Gipromez itself for this work. It is, therefore, incorrect to say that the project report was not examined in sufficent detail by the technical committee. Such a statement is not justified when it is borne in mind that M/s. Dasturco's senior experts on the technical committee signed the report. The aspersion that the purpose of appointing the technical committee was only to complete the formality is belied by the depth in which the report was scrutinised by the widely representative technical committee.

[Ministry of Steel & Heavy Engineering, O.M. No. B-25(8)/70 dated the 24th April, 1971]

Recommendation (Sl. No. 1)

The Committee find that Dr. M. N. Dastur was encouraged by the Government to set up a consultancy service. He was also entrusted with the assignment of preparing a preliminary project report and also later a DPR was also made use of by the Russian collaborators. In short, M/s. Dasturco were our consultants on steel, as was also stated in the Lok Sabha.

The Committee find that Dasturco were not associated in the discussions which Government/BSL had with Soviet collaborators after July, 1964.

Thus Dasturco who were General Consultant of the Ministry till then was completely side-tracked while technical details were settled for the drawing up of the DPR for Bokaro steel project. Dasturco's complaint is that they were kept out of any technical discussion with the Soviets in August, 1964 and thereafter "which had important technical implications and ultimately resulted in a high cost project."

The Committee were anxious to find out as to why Dasturco was kept out of these negotiations. The Chairman of BSL and the Secretary of the Ministry explained to the committee that the Russians were not willing to accept Dasturco as principal consultants. The Chairman of BSL further explained that "we discussed it for several days and unfortunately we were not able to persuade the Soviets to give a large chunk to Dasturco". The Committee feel that the Chairman of BSL who was also the Secretary of the Steel Ministry at that time reversed the whole position of Dasturco as a principal steel consultant as was reported to the Lok Sabha on 9-4-1964. The important point was not to secure enough work for Dasturco, but it was far more important that Dasturco's knowledge and experience ought to have been fully utilised for the establishment of a technically sound and economic steel project to suit the Indian conditions. The whole purpose of getting the design consultancy set up by Dasturco with the Government initiative at the earlier stages was lost sight of and it was not put to good use in setting up the Bokaro steel plant for which purpose alone Dasturco was brought to India.

(Paras No. 2-23-2-26)

Reply of Government

Para 2.23

It is correct that Dr. Dastur was encouraged by the Government to set up a consultancy service in the country and that they were also given specific assignments by HSL against separate agreements to prepare a preliminary project report and subsequently a DPR for Bokaro. M/s. Dasturco were also the general consultants of the Steel Ministry at the time of the announcement of the Soviet aid for Bokaro. It may, however, be noted that they were not the BSL consultants for the Bokaro project at that time as there was no contract between Dasturco and BSL.

Para 2.24

It is true that Dasturco were then the General Consultants of the Steel Ministry but it is to be appreciated that they were not the consultants of the BSL at that time. The discussions which BSL had with the Soviets after July, 1964 were, as already explained, mainly for the purpose of settling certain details. A fact finding team came from the Soviet Union for the purpose. The association of Dasturco with such discussions as BSL had with the Soviets was not necessary as no vital negotiations were to take place at that stage. Whatever details Dasturco had on Bokaro steel project were already incorporated in DPR prepared by them, a copy having been furnished to the Soviets. These discussions did not have any major implications and it is also incorrect to assert that this resulted in a high cost project. As has been explained in subsequent paras, the cost of the project as per Soviet DPR cannot be regarded as high in comparison with the project conceived under Dasturco's project report. The statement, therefore, that non-association of Dasturco in these discussions resulted in a high cost project lacks factual basis.

Paras 2.25 & 2.26

The change in the role of Dasturco in the establishment of Bokaro steel project which was earlier conceived as that of the principal consultants to the role as the Indian consulting engineers was made not by then Chairman of BSL, who was then also the Secretary of the Steel Ministry; this decision was based on the changing facts of the situation. As explained to the Committee in the course of various written replies, it was the intention of the Government to keep readily available a preliminary project report on the project for use in the negotations with any possible foreign collaborators. The services of Dasturco were utilised for this purpose. In pursuance of the objective to proceed with further work on Bokaro steel project and to avoid loss of time, even when no definite source of foreign aid was in sight, it was decided to go ahead with the preparation of DPR. This work was also entrusted to Dasturco in pursuance of the policy of the Government to utilise indigenous consultancy services. The search for foreign aid was in progress during the time Dasturco were preparing the DPR. When no definite source of foreign aid was in sight after the withdrawal of the request for American aid, it was the intention of the Government to proceed with the project with Dasturco as the principal consultants and with such foreign aid as might become available. This was considered as a suitable alternative under the conditions prevailing at that time, but not necessarily the only consultancy arrangement for implementing the project. It may be mentioned that US AID which got a feasibility study of the project made through US Steel Corporation in 1962-63, envisaged that they would, not only be responsible for engineering and executing the whole project, but also would retain the management of the steel plant for a period of 10 years in their own hands. The Soviets also considered that they had to be principal consultants of the project as they had to implement the project and also guarantee its performance. Having accepted Soviet aid, to which there was no better alternative available and while a heavy investment was at stake, the Government was naturally anxious to ensure that Soviets remain responsible for the technical soundness of the project. The important thing was to ensure that a technically sound plant was established by utilising the assistance offered by the Soviets rather than to safeguard the position of Dasturco as the principal consultants. Dasturco have, however, been assigned adequate and useful role in the construction of this project and their knowledge and experience has been utilised. The establishment of this firm in India was encouraged not only for setting up of Bokaro steel project but with a view to developing indigenous technical know-how for steel technology in the country. The services of this firm have been utilised in various ways including an important and major role in the establishment of the Alloy Steel Project at Durgapur. Recently they have been assigned the task of preparing feasibility reports on the two new steel plants at Visakhapatnam and Salem.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971]

Recommendation (Sl. No. 2)

The Committee find that the DPR was submitted by the Soviet collaborators on 2-12-1965. It was then examined by a technical committee of 22 persons and this technical committee took hardly a month to examine this important document, on the basis of which the Bokaro steel project was taken up and they submitted their report towards the end of January, 1966.

The Committee feel that the DPR deserved a far greater scrutiny and that it was not given a proper technical appraisal on the basis of which investment decision of over Rs. 600 crores ought to have been made. Dasturco no doubt had two representatives on this technical committee out that would not amount to a proper technical appraisal by them of the DPR. The committee feel that the examination of the DPR by a technical committee can normally provide a second opinion. Effective scrutiny by the nature of work itself can only be made by a closely coordinated, competent, consultancy organisation. DPR has to be reviewed not piecemeal with loose association of pieces but as an integrated project report.

(Para No. 2.27)

Reply of Government

A detailed project report for such a project prepared by any consultant is normally examined by a technical committee consisting of the specialists of different aspects of the project. It is not normal practice to entrust a DPR prepared by one consultant to another consultant for scrutiny and report before acceptance.

The technical committee appointed to examine the Soviet DPR consisted of the former Chief Engineer of CEDB, who was a recognised steel technologist in the country, and who was then Mg. Director of BSL. The committee consisted of 21 other members, three each from CEDB and Bhailai, two each from Dasturco, TISCO, Durgapur, Rourkela and SE Railway and one each from HSCL, NMDC, NCDC, Department of Mines and Metals and DGTD. Each of these agencies had nominated their competent exports to serve on this committee. Such a broad-based committee had hardly been set up earlier for similar work in this country. In order to closely examine the different aspects, the committee divided itself into a number of sub-committees which held continuous sessions for days together before arriving at their conclusions. The committee itself met regularly and examined the report in considerable detail from all aspects. The report of the commitee was unanimous. Dasturco's representatives themselves on the committee were also specialists. It is considered that substantial advantage has been gained through this examination of the project report by a technical committee of the composition and nature set up by Government. The Soviet DPR was thus reviewed in depth and in an integrated manner and not piecemeal.

It is not possible to agree with the views expressed by Dr. Dastur. Dasturco's DPR submitted in July, 1963 for Bokaro was examined by a technical committee consisting of four persons only (two additional members were subsequently coopted) set up by HSL. The original members of the committee were representatives of HSL; persons subsequently coopted were from TISCO. This committee no doubt set up seven sub-committees consisting of experts from CEDB and other steel plants of HSL, experts from TISCO and representatives of Railways. It will be observed that even the sub-committees were not as representative and broad-based as the main technical committee set up to examine the Soviet DPR. Though the committee was set up in August, 1963 and submitted its report in February, 1964, it met only three times before finalising its report. Even the sub-committees had only a few meetings each. Thus, though the committee took longer time to submit its report, its examination of Dasturco's project report was in no greater depth than the detailed examination made of the Soviet DPR in course of a month which the technical committee took to submit its report. In any case, the scrutiny of the Soviet DPR by another firm of

consultants would not have been appropriate and, further, would not have dispensed with the need for its scrutiny by a technical committee. It should also be stated that by entrusting the job of scrutinising the Soviet DPR to a technical committee, the Soviet DPR was scrutinised in a manner no different from that in which Dasturco's DPR was scrutinised.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971]

Recommendation (Serial No. 3)

Dasturco was also asked to make a cost reduction study after signing the Memorandum on the acceptance of the D.P.R. The Committee, however, feel that this ought to have been done before signing the Memorandum of acceptance. It was explained to the Committee that the agreement had to be signed within two months of the submission of the D.P.R. The Committee feel that the Government should have resisted being stampeded into signing such an important agreement without a proper and detailed scrutiny.

(Para No. 2.28)

Reply of Government

The cost estimates of the Project as per Soviet D.P.R. were scrutinised by the Technical Committee which included two representatives of Dasturco. The Technical Committee itself had discussed in detail the capital investments with a view to reduce costs and substantial cost reductions were effected in erection and construction costs. On the basis of these, cost estimates for different alternatives for Stage I were recommended by the Technical Committee. This formed the basis for preparation of the estimates subsequently by the management of BSL and recommendation to the Government. Subsequently, a study was made of the cost estimates also by a Committee headed by the then Special Secretary, Ministry of Finance. The comperative estimates of investment costs at 4 million tonne stage submitted by the Soviet Consultants and included in the Interim Report of the Committee indicated that the project was no more expensive than those designed by Dasturco or by U.S. Steel. The Chief Engineer of the Central Engineering & Design Bureau, the other Steel Consultants in the country, stated that the plant was well laid out, the processes proposed were sound and equipment selected were essential and adequate. He also expressed the view that from overall investment point of view the cost was not unreasonable. Dasturco through their representatives on the Technical Committee had accepted the cost estimates. They were given another opportunity to make such suggestions as they could give. Since it was considered both by the Technical Committee as well as after the examination made by the Government that the estimates were reasonable, it was decided not to delay the acceptance of the project report.

It would not be correct to say that Government were stampeded into signing the memorandum of acceptance of the D.P.R. The Inter-Governmental Agreement of 25-1-1965 itself provided for the time schedule for various stages. In terms of this agreement, the project report was to be accepted within two months from the date of its submission. In order to complete the examination of the report of the technical committee and its acceptance by the Government, this was extended by one month by agreement with the Soviet party. The extended period provided adequate time for consideration and acceptance of the report. The extension of the period

of acceptance of the project report any further would have delayed conclusion of the contract for supply of equipment and materials from USSR which were to be made during 1966-69.

It may be noted that the following provision was nevertheless made in the Memorandum of Acceptance of the D.P.R. for reduction of the cost estimates of Bokaro steel plant.

"With a view to reducing the capital investment for setting up the plant, BSL desire that the appropriate Soviet organisations should be asked that during the course of the detailed engineering and preparation of drawings for the project, they would further study possibilities of cost reduction. In doing so, they will give due consideration to any concrete technical suggestions which may be made to them by the Indian side within three months from the date of this Memorandum. In addition, further possibilities of cost reduction will, of course, be continued to be explored during the course of the detailed implementation of the project, as is normal in all such projects, over the next five years. ....."

This provision had been duly implemented both by the Indian and Soviet parties, and considerable cost reduction effected.

[Ministry of Steel & Heavy Engineering O. M. No. B-25(8)/70 dated the 24th April, 1971]

Further information called for by the Committee

1. It has been stated that "a study was made of the cost estimates by a Committee headed by the then Special Secretary, Ministry of Finance. The comparative estimates of investment cost of 4 million tonne stage submitted by the Soviet Consultants and included in the Interim Report of the Committee indicated that the project was no more expensive than those designed by Dasturco or by U.S. Steel."

   (a) Please furnish a copy of the Interim Report of the Special Secretary containing the above-mentioned comparative estimates of the investment cost.

   (b) The final Report submitted by the Special Secretary may also be furnished.

2. The Ministry have also stated as follows :—

'The Chief Engineer of the Central Engineering and Design Bureau, the other Steel Consultants in the country stated that the plant was well laid out, the processes proposed were sound and equipment selected were essential and adequate. He also expressed the view that from overall investment point of view, the cost was not unreasonable.'

Please furnish a copy of the document containing the above views of the Chief Engineer of the Central Engineering & Design Bureau. [L.S.S. O.M. No. 12-PU/70 dated 15-9-1971].

Reply of Government

1. (a) A copy of the Interim Report of the then Special Secretary Ministry of Finance, Department of Expenditure (Late Shri K. L. Ghei), is enclosed. (Appendix IV).

   (b) The final report could not be submitted on account of the sudden demise of Shri Ghei.

2. The views of Shri R. P. Sinha, former Chief Engineer, Central Engineering and Design Bureau, are contained in his letter No. CDB-CE (BSL)/273 dated the 5th March, 1966, a copy of which is enclosed as Annexure III to the Ghei Committee's Report, attached with reference to 1 above.

[Ministry of Steel & Mines, Deptt. of Steel, O.M. No. B-25(8)/70 dated 16th October, 1971]

Recommendation (Sl. No. 4)

The Committee have found during the course of its examination of the public sector undertakings during the last two years, namely, IDPL, MACC, IOC and Bokaro Steel Limited that the advice of the Indian experts was ignored in preference to the advice of the foreign collaborators of those undertakings. The result in all these cases has not been happy. The foreign experts have a limited knowledge or have practically no knowledge of the conditions prevailing in India. They are generally guided by their own experiences. Therefore, to completely side-track the Indian experts is not a correct thing to do. The undertakings and the Government will do better in future if they keep this in view. The Committee would also like that in future if the Government decide to over-rule the advice of the Indian experts it is better that the reasons may be fully recorded so that at a future date there may be a proper appraisal of the views of the experts and the decisions of the Government.

(Para No. 2.29)

Reply of Government

It is not a fact that the views of Indian experts were ignored in the case of BSL in preference to the advice of the foreign collaborators. The views of Dasturco were considered on merit on each occasion and they were also provided adequate opportunities to express them. In the case of the project report for Bokaro, the recommendations of the foreign collaborators were not accepted without due consideration but on the contrary besides the Indian consultants, who were not only Dasturco but CEDB also, other agencies concerned were also consulted and due weightage was given to their views. The Indian experts, which included among others, those from CEDB, Rourkela, Bhilai, Durgapur, TISCO, etc., besides Dasturco, were not side-tracked. It is also not a fact that Government decided to overrule the advice of the Indian experts. In fact, the project report was accepted on the basis of the report of the technical committee which included Indian experts from all relevant fields.

It may also be mentioned that the Bhilai plant was constructed with Soviet technical assistance, and hence in this case the foreign collaborators had considerable experience of conditions prevailing in India.

[Ministry of Steel & Heavy Engineering O. M. No. B-25(8)/70 dated April 24, 1971]

Further information called for by the Committee

Please furnish the action taken by Government on the following recommendation of the Committee :—

"The Committee would also like that in future if the Government decide to overrule the advice of the Indian Experts, it is better that the

reasons may be fully recorded so that at a future date there may be a proper appraisal of the views of the experts and decisions of the Government." [L.S.S.O.M. No. 12-PU/70 dated 15-9-71]

Reply of Government

Since this recommendation was of general application to the public sector enterprises, a copy of the recommendation was forwarded to the Ministry of Finance, Department of Expenditure, with the remarks that the Bureau of Public Enterprises may circulate it to the concerned Ministries for their information and guidance.

[Ministry of Steel & Mines, Deptt. of Steel, O.M. No. B-25(8)/70 dated October 16, 1971].

Recommendation (Sl. No. 5)

The Committee find that Dasturco, the Indian consultants of BSL had pointed out that there was a good scope of cost reduction amounting to about Rs. 107.5 crores even if the basic assumptions of the Soviet DPR were accepted. In spite of that no worthwhile effort was made to bring down the capital investment. The Government was aware of the capital cost per ton of steel plant in India. The Committee has been told that the capital cost would be Rs. 2,474 (now revised to Rs. 2,725 as stated in Rajya Sabha on 16-3-1970) in Bokaro steel plant in its second stage, *i.e.*, when the production will be 4 million tonnes but in the first stage when the production will be 1.7 million tonnes the capital cost per ton of steel at Bokaro would be Rs. 4,000 per ton. In view of this very heavy investment in Bokaro, the Government ought to have given a more serious consideration to the question of the cost reduction study. (Para 3.30)

Reply of Government

At the time of entrusting the cost reduction study to M/s. Dasturco they were general consultants of the Steel Ministry, and it was in this capacity that they were entrusted with the work. They were appointed Indian consulting engineers of the company at a much later date.

The recommendations of Dasturco were considered by the technical experts of the Bokaro steel project which included the then Mg. Director, who himself was a steel technologist of repute. Naturally the Government was interested in bringing about savings and with this end in view every possible avenue of cost reduction was fully considered. The consultants were given full opportunity to make their points in India and in USSR. It is not clear why they withheld in India detailed technical basis for their suggestions. In the discussions held in Moscow their representatives were on all the panels constituted to examine their cost reduction proposals. In the course of technical scrutiny, their proposals could not be sustained. In fact in the discussions in Moscow, they themselves accepted that in some cases the savings were over-estimated due to adoption of lower rates for certain items of work.

The Committee, after examining the various views conveyed to it on the different cost reduction suggestions of Dasturco, appear to have concluded that most of the suggestions made by Dasturco could not be supported.

As regards investment cost per tonne of steel after the 2nd stage of Bokaro steel plant, it was clarified by the then Minister of Steel & Heavy Engineering when replying to one of the supplementaries in respect of Rajya Sabha Starred Question No. 435 answered on 16-3-1970, that taking into account the production of about 900,000 tonnes extra pig iron, the cost estimates would be a little less than Rs. 2,500 per tonne.

[Ministry of Steel & Heavy Engineering O. M. No. B-25(8)/70 dated April 24, 1971]

Recommendation (Sl. No. 6)

The Committee however regret to note that as against the suggestions of M/s. Dasturco for cost reduction amounting to Rs. 107.5 crores in the 1st stage of Bokaro steel project, suggestions to the extent of Rs. 9.5 crores only could be given effect to. As the suggestions for cost reduction are highly technical the Committee are not in a position to examine them from technical point of view. They, however, find that in case of steel melting shops the Soviet consultants themselves recommended the installation of 250 ton convertors in the II stage of BSL. As pointed out by M/s. Dasturco in their cost reduction study, the world trend including Japan, USA, West Germany is to adopt convertors of 200 to 300 tonnes capacity for large new plants of the type visualised at Bokaro. The reasons for having 200 to 300 tonnes convertors are that investment is lower, refractory consumption decreases, handling of hot metal scrap, fluxes, slag and ingot moulds is simplified and operating costs are lower. It was estimated by Dasturco that there could have been a saving of Rs. 1.4 crores in operating cost per year by installing convertors of 250 tonnes. There would have also been a saving of about Rs. 18.7 crores in the capital cost. The Committee are, therefore, of the opinion that Government should have more thoroughly examined this matter and the idea of obtaining 250 ton convertors from other sources ought to have been examined in order to bring down both capital and operating costs. (Para 3.31)

Reply of Government

The posibility of installing 250-ton convertors was considered right from the beginning. At the stage of preparation of the Design Assignment in August, 1964, installation of 250-ton convertors was suggested. The Soviet specialists expressed themselves against this. Such convertors were in an experimental stage of development at that time. The experience available in India was also limited to convertors with capacity of 40/60 tonnes. Indian dolomite is not as good as the dolomite available in other countries using LD process for making the tar dolomite convertor lining and with this uncertainty in the quality of dolomite, it would not have been prudent to instal larger convertors straightaway. Considering all aspects of the matter, the Soviet specialists suggested that installation of 250-ton convertors should be deffered to stage II of the project. This aspect was duly and carefully considered by the technical committee constituted to examine the DPR and the technical committee accepted the recommendations of the Soviet experts.

The experience of operating large sized convertors during 1965, when the Soviet DPR for Bokaro was finalised, was limited. Except in the USA most of the convertors installed at that time in various parts of the world were below 200-tonne capacity; only a few were 200-tonners. This was the position prevailing in the developed countries like UK, Japan, Germany and

France. It would have been a very risky plan to straightaway go in for 250-ton convertors.

The proposal of Dasturco to set up a single four 250-ton convertor shop was fully considered. From the very inception doubts were expressed whether a single steel melting shop could be expanded to provide a capacity of 5.5 m.t., the ultimate capacity of the project. Dasturco had admitted that to their knowledge, the largest single steel melting shop in the world had a capacity of about 3.5 m.t. In the course of discussions at Moscow, Dasturco's representatives were unable to present a convincing case to show that savings of the order of Rs. 220 million would result by installing two 250-ton convertors in the first stage and four 250-ton convertors in the second stage. A single shop for four 250-ton convertors, it was found, would not be able to produce 4 m.t. of ingot steel. It would have been necessary to provide five 250-ton convertors for producing 4 m.t. of ingot steel. In the opinion of Dasturco, it was possible to produce 2 m.t. of ingot steel per year for the first stage with one convertor operating at a time, whereas the Soviet experts estimated that not more than 1.5 m.t. could be produced, considering the raw material quality available for Bokaro. It was further opined by the Soviet specialists that to feed a shop with raw materials containing five 250-ton convertors at 4 m.t. stage and for the movement of finished steel and slag would by itself create operating difficulties.

The Soviet side also did not accept the cost estimates of Dasturco. In their opinion, for five 250-ton convertors the cost would be of the order of about Rs. 447 million, adjusting the estimates of Dasturco which were based on lower rates for civil construction work and structural steelworks, etc. The Soviet experts also did not find it possible to agree with the recommendations of Dasturco that large sized convertors would yield a saving of nearly Rs. 14 million in the operating cost.

[Ministry of Steel & Heavy Engineering O. M. No. B-25(8)/70 dated April 24, 1971]

Recommendation (Sl. No. 7)

3.32. The following features also stand out rather conspicuously while reviewing the whole course of the finalisation of the agreement with the U.S.S.R. :

(i) Messrs Dasturco were asked to make a cost reduction study on 29th March, 1966. But without waiting for their Report on that very day Government communicated to the Soviets the acceptance of their D.P.R. Contracts were also signed on 3rd May, 1966 for the preparation of working drawings and for rendering technical assistance including supply of equipment. Thus the negotiations with Soviets were rushed through and there was little chance of acceptance of any major changes in the designing of Bokaro Steel Project by the Soviets. Government should ensure that the agreements do not have the effect of foreclosing issues of crucial importance in particular those which have a bearing on the efficiency and economics of the plant.

(ii) The Memorandum of acceptance of DPR provided that the Soviet Consultants would give due consideration to concrete technical suggestions for cost reduction which might be made to them by the Indian side within three months, M/s. Dasturco were therefore, asked to give concrete proposals for cost reduction within seven weeks. The Committee are informed that the report submitted by M/s. Dasturco 'lacked detailed technical design

basis, detailed cost calculation and break-up of cost savings'. As these were not readily forthcoming, Government had to send the delegation to Moscow to discuss the proposals with the Soviets without the study of the details of the suggestions of Dasturco. The delegation was not in a position to argue fully and convince the Soviet Consultants with the proposals. It was admitted by B.S.L. that the discussions (at Moscow) were no doubt handicapped by the Bokaro Steel representatives not being fully conversant with the details of the design data and the cost reduction basis by Dasturco.

The Committee feel that all the discussions with Dasturco ought to have taken place in India and all the points should have been sorted out before going to Moscow. The Committee have not been able to appreciate that as the agreement had to be signed in a short time on a particular date, therefore, proper consideration to the whole matter was not feasible. The Government ought to have insisted on having enough time for the consideration of the report and other connected matters before signing the agreement.

(iii) The Committee also feel that it would have been better if the leader of the delegation which was to discuss highly technical matters had been a technical person especially when on the other side the head of the team was a technical man. They desire that the delegation for such technical negotiations either with foreign companies or Governments should as far as possible be headed by technical chiefs.

(iv) Dr. Dastur stated in his evidence that 'Mr. Wanchoo dominated in the meetings (at Moscow). Whereas from the Soviet side the head of the design Institute, my equivalent, was the leader of their team and he used to argue, from our side, Mr. Wanchoo was the leader to our team and he used to argue and we were only allowed to have a few words in sideways'. On the other hand the Chairman, BSL stated that 'we appointed 5 or 6 panels consisting wholly of technicians in each of which Dastur was represented'. B.S.L. also informed the Committee that 'Dasturco had ten of their representatives in the delegation who argued their proposals but they were not able to convince the Soviet side.' The Committee are left with the impression that there was lack of cooperation and proper understanding among M/s. Dasturco. Bokaro Steel Plant and the Government of India. Had there been a greater understanding and cooperation, probably the results would have been better in the interest of the country.

(v) The Committee feel that because the Chairman of B.S.L. also happened to be the Secretary of Steel Ministry who led the delegation, the Ministry was denied an opportunity to have a second look at the negotiations and to the agreement of reduction of only Rs. 9.5 crores in the capital cost of the Project in place of suggestions to the extent of Rs. 107.5 crores by Dasturco.

Reply of Government

(i) While accepting the detailed Project Report, a suitable clause had already been provided that the Soviet Consultants would give due consideration to any concrete technical suggestions for cost reduction which might be made to them by the Indian side within three months from the date of the signing of the Memorandum. The contracts for preparation of working drawings and for rendering technical assistance including supply of equipment were signed as per the time schedule provided for the same under the inter-governmental agreement of 25th January 1965. The negotiations leading to the finalisation of these contracts were in progress simultaneously with

the consideration of the detailed project report and the views of various Indian agencies were taken into consideration while finalising these contracts. The negotiations with the Soviets were thus not rushed through. There was also no question of any major changes in the designing of Bokaro Steel Project as a result of the study by Dasturco, since a broad based Technical Committee, which included the representatives of Dasturco, had found the Soviet detailed Project Report acceptable with modifications suggested by it. The cost reduction study was entrusted at Dasturco, as they maintained even after the detailed consideration of the Soviet DPR by the Technical Committee that substantial cost reductions were possible. They were thus given another opportunity to express their views on the question of the cost reduction and the option to consider their suggestion was retained. As has been explained, the suggestions made by Dasturco were mostly found technically unsound even by the Indian experts and savings proposed were found highly exaggerated. The postponement of acceptance of the project report and conclusion of the contracts with the Soviets, pending receipt of Dasturco's proposals, would have further delayed the project by upsetting the schedule incorporated in the inter-governmental agreement.

(ii) It is accepted that all the discussions with Dasturco ought to have taken place in India and all the points should have been settled before going to Moscow, Dasturco were aware that in the agreement with the Soviet side a time limit of three months had been agreed upon for submission and consideration of the cost reduction proposals from the Indian side. Dasturco were given 7 weeks' time from this date for submission of their proposal. Although their report was submitted during this time in the absence of detailed break-up of the savings suggested, the proper and immediate examination of their proposal became difficult. Despite the assurance of Dasturco to furnish the details, the information was not furnished. It was only in Moscow that the working papers and supporting data on some of their suggestions were made available. As any decision to delay further discussions with the Soviet side on Dasturco's proposals might have held up detailed designing work, it was decided to let Dasturco have full opportunity to present their view points in Moscow. The time allowed for submission and consideration of Dasturco's cost reduction proposals was considered adequate especially when the DPR had been fully considered by a technical committee on which Dasturco were represented.

(iii) The delegation sent USSR which, *inter alia*, discussed with the Soviet authorities the proposals for cost reduction study could not be confined only to technical personnel, as they had to carry negotiations at Government level. It was, therefore, considered appropriate that while the delegation was headed by the Steel Secretary, technical experts of both the Bokaro steel project and Dasturco were included in the team. The head of the Soviet side in the negotiation, Mr. Sergeev, was no doubt a technical person, but he represented the Soviet side in his official capacity as a Deputy Minister in the Soviet Government. Whenever a team is sent out for purely technical discussions, it comprises of technical persons.

(iv) As stated in para (iii) above, the Soviet side was represented by Mr. Sergeev in his official capacity in the Soviet Government. He was not the head of the Soviet Design Institute. Dr. Dastur and the other steel technologists were afforded ample opportunities to express their points of view. At no stage, it was felt that there was lack of understanding and cooperation between the various members of the Indian delegation. As leader of the delegation, Mr. Wanchoo, Steel Secretary, had to conduct the discussions on

behalf of the Indian side, and the representatives of Dasturco were provided full facilities to express themselves at various levels of discussions.

(v) The cost reduction study was entrusted to Dasturco in their capacity as the general consultant of the Government and the proposals were, therefore, made by Dasturco to Government. After considering the cost reduction study and the comments of BSL thereon, the Government decided to send the delegation to Moscow to discuss these with the Soviet side. This was an official delegation on behalf of the Government of India and as such, it is considered was rightly led by the Steel Secretary in his capacity as the Secretary to Government, though he then also happened to be the Chairman of BSL.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971]

Further information called for by the Committee

It has been stated that 'the suggestions made by Dasturco were mostly found technically unsound even by the Indian experts and savings proposed were found highly exaggerated'.

Please furnish copies of the documents to support the above statement.

[L.S.S. O.M. No. 12-PU/70 dated 15-9-1971]

Reply of Government

The cost reduction proposals, submitted by Messrs. Dastur & Co., were first examined by the management of Bokaro Steel Ltd. and discussed with the representatives of Messrs. Dastur & Co. Detailed information—technical calculations including parameters on which they were based and cost break-up which were asked for by Bokaro Steel Ltd. were not furnished. Subsequent discussions on these cost reduction proposals were carried out in this Ministry in which representatives of the Planning Commission, Ministry of Finance as also C.E.D.B. were present. Extract from the minutes relating to main conclusions are enclosed (Appendix II). These discussions were held before the Delegation left for Moscow.

The proposals of Dastur & Co. were also discussed by the Delegation headed by Shri Wanchoo, former Chairman, B.S.L. to Moscow during June-July, 1966, and relevant extract from the conclusions given after the discussions and Delegation's report are also enclosed (Appendix III).

[Ministry of Steel & Mines, Department of Steel, O.M. No. B-25(5)/70, dated 14th January, 1972]

Recommendation (Sl. No. 8)

There was likely to be an increase of about Rs. 90 crores over sanctioned capital estimates of Rs. 670 crores for first stage of Bokaro Steel plant. It is, however, surprising that until recently the management of Bokaro steel plant was not aware of the extent of increase in the capital estimates. The Committee were informed as late as September, 1969 that the fact whether the original estimates could be adhered to or not will be known only after the review of project estimates undertaken by the management was completed. One of the important tools of management is proper accounting and reporting system which records the variations from the original estimates under various

heads and enables the management to know at any point of time the total expenditure likely to be incurred on a project, the extent of variations from the original estimates and the reasons therefor. Bokaro has a Finance Division. It is the primary function of division to keep track of financial provisions, progress of expediture and revised estimates, etc. The Committee are unable to appreciate why BSL did not asses in time the ultimate cost of the project and variations from the original estimates.

(Para 3.38-3.39)

Reply of Government

The project estimates of the company are reviewed on a continuous basis. The progress of expenditure in relation to the project estimates is examined each month.

The project estimates of the company were approved by the Government on 17-11-1966. While considering increase in the authorized capital of the company, the Board of Directors at its 36th meeting held on 9-4-1969, directed that a detailed exercise to review the project estimates should be undertaken and completed within the next few months. The revised estimates for the plant were considered by the Board of Directors at its 40th meeting held on 24-9-1969. In this meeting the Board decided that the revised estimates should be submitted in the same proforma as the original estimate for the plant and equipment and the estimates should be revised on a realistic assessment of the orders already placed. The revision to the project estimates was considered by the Board of Directors again in its 41st meeting held on 4-11-1969. The Board authorized the Chairman to finalize the revised project estimates and forward the same to the Government for approval by making suitable adjustments on account of provision for escalation. The revised estimates amounting to Rs. 7.080 million as against the sanctioned estimate amounting to Rs. 6,206.27 million for the main plant were forwarded to the Government for approval on 10-1-1970. It will be seen that the estimates have been reviewed at the level of the Board of Directors also and action was taken to revise the estimates when it became necessary.

The increase in the estimates amounting to Rs. 874 million is explained below :

(i) *Indigenous Equipment* : There is an overall increase of Rs. 604.31 million in the cost of indigenous equipment based on contracts finalised or prices indicated by the public sector undertakings. The increase in cost of supplies of equipment is mainly in respect of supplies from HEC, Instrumentation Ltd., Kota, and BHEL, Hyderabad. The supply price of equipment and materials payable to HEC was decided by the Government of India on 29-4-1969. The contract price with Instrumentation Ltd., Kota, was settled on 4-8-1970. The contract with BHEL, Hyderabad was signed on 23-4-1970. It will be observed that it is only after the actual price of equipment and materials to be supplied by HEC was decided by Government, that it became clear that project estimates would need a substantial revision and this question was then taken up by the Bokaro management.

As against this increase of Rs. 604.31 million, the cost of imported equipment decreased by Rs. 5.73 million. Therefore, the net increase in the cost of plant and equipment amounts to Rs. 598.58 millions (Rs. 604.31 minus Rs. 5.73 million).

(ii) *Escalation* : In the original estimates provision for escalation was not made. In a project the construction of which is spread over a large number of years, it is not possible to forecast the likely increase on account of escalation. The fact that no provision was made for escalation was recorded by way of a note to the estimates. The increase in escalation, as a result of rise in the cost of labour and steel has been determined at Rs. 200 million.

(iii) *Administration during Construction, Contingencies, etc.* : The provision under these heads have been revised adopting the same principle as for the original sanctioned estimates. The net increase in the project estimates under these heads amount to Rs. 75.42 million.

At the time of submitting answers to the questionnaire of the Committee, and subsequently during the oral evidence before the Committee, the project estimates were in fact under review.

It will thus be seen that timely action was taken to revise the estimates immediately increases in costs having substantial implications became known.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70, dated the April 24, 1971]

Further information called for by the Committee

It has been stated that the revised estimates amounting to Rs. 6206.27 million for the main plant was forwarded to the Government for approval on 10-1-1970.

(a) Have these estimates been approved by Government? If so, when?

(b) If not, what are the reasons for the delay in sanctioning the estimates?

(c) In reply to a question in Parliament in March, 1970, it was stated that the total investment for Bokaro Steel Plant was estimated to be of the order of about Rs. 760 crores. What are the reasons for variations between the figures of Capital estimates as given to Parliament and those submitted to Government for approval.

[L.S.S.O.M. No. 12-PU/70 dated 15-9-71]

Reply of Government

In the reply furnished by this Ministry, under this Para, it has been mentioned that the revised estimates amounting to Rs. 7080 million and *not* Rs. 6206.27 million (which represents the original estimate sanctioned by Govt.) were forwarded to Government for approval on the 10th January, 1970. Reply to the other points are given below *ad-seriatim* :—

(a) The revised estimates have not yet been approved by Government. The revised estimates have been scrutinised and discussed in detail with the Ministry of Finance, and the estimates are being submitted to the Cabinet for approval.

(b) Does not arise, in view of the position stated in Para 1 above. The revised estimate of Rs. 7080 million is for the Steel Plant proper; the revised estimate for the project as a whole is Rs. 7584 million, rounded to Rs. 7600 million or Rs. 760 crores.

[Ministry of Steel & Mines, Department of Steel O.M. No. B-25(8)/70 dated the October 16, 1971]

Recommendation (Sl. No. 12)

The Committee are distressed to note that the date of completion of the Bokaro steel plant has been revised twice and as a result of these revisions the completion of the construction has definitely been delayed by 27 months from the date of the original schedule of completion of construction. It has been stated now that stage-I is expected to be completed according to the revised schedule by June, 1973. But the Committee find that even this date will not be adhered to because of the various uncertain factors pointed out by BSL (vide paragraph 4.3—page 69). The Committee has been unable to ascertain even the tentative date as to when the construction of the first stage is likely to be completed. The Committee recommend that this matter should be properly examined and a firm date of completion of the stage-I should be reported to the Committee.

(Para No. 4.7)

Reply of Government

Various factors of uncertainties in respect of implementation of the revised construction schedule prepared in July, 1969 and mentioned in para 4.3 of the Report were reported to the Committee in December, 1969. The preparation of civil engineering drawings of raw materials plan is no more a problem. About 76% of the concrete and RCC work for this plant has already been completed. Abount 32% of the structures have been erected and about 4% of equipment erection has also been completed. The progress of civil works for the plant as a whole has been stepped up by HSCL since the information was submitted to the Committee. Abount 73% of concrete and RCC work has been completed. In the cold rolling mills zone about 54% of the concreting work has been completed till February, 1971 and 91% of the target till then was achieved. The rate of concreting is quite satisfactory. In the hot rolling mill zone, the position is till not so satisfactory. Only about 49% of the total quantity of RCC and concrete work has been completed which was about 66% of the target. The monthly average during December, 1970 to February, 1971 was 9,455 cbm. The rate will, however, have to be raised to 20,000 cbm. to achieve the target. HSCL have increased the number of agencies on this work and the progress is expected to be faster in this zone now.

The position of supply of cranes ordered from USSR is quite satisfactory. Out of cranes ordered from USSR, 18 have already been despatched. The remaining crane is expected to be despatched shortly. The position of supply of cranes by the public sector undertakings for the steel melting shops and rolling mills is, however, not very satisfactory. The position as it prevails now is that delays in supplies of indigenous equipment and refractories may affect the present construction schedule. As against the delivery till February, 1971, 88% of the equipment has been received from USSR, HEC has, however, supplied only about 32%, MAMC about 35% and the private sector 22% of the orders. As regards refractories the supplies from indigenous sources amount to about 34% of the total, which was about 64% of the cumulative delivery targets. The defaults in supplies of refractories from the indigenous sources have adversely affected the construction schedule. The shortage of raw steel from indigenous sources like plates and sheets, rolled sections and even reinforcement steel is posing a problem.

For Bokaro stage-I, the work was started in October, 1967, and it will take about 5½ years' time to complete the first stage of the plant of 1.7 million tonnes steel ingots and 0.88 million tonnes of foundry grade iron. In HSL plants, Durgapur has come upto one million tonne stage in 5 years 6 months, Bhilai in 4 years 6 months and Rourkela in 5 years and 2 months. Thus Bokaro's schedule compares favourably with that of HSL plants. Besides, the Soviet phasing of the construction schedule for the first stage of Bokaro steel plant was 5½ years without the cold rolling mills and 6½ years with the cold rolling mills (the period to be reckoned from the date of acceptance of the project report). Dasturco's project report for Bokaro envisaged a completion time of 4½ years for 1.5 million tonne plant, and the US Report provided for about 5 years for completion of the first stage of 1.4 million tonnes. The Soviet experts were of the view that because of large volume of construction work and also large tonnages of equipment to be procured, it would not be possible to reduce the construction period. This phasing was considered carefully, and a period of only 5 years was fixed as the target for completion of the whole 1st phase of the plant. Thus the original Bokaro schedule was very tight and there was no cushion for any delay being accommodated in the programme of construction originally envisaged.

Every effort is being made to undertake the construction and erection work on the project as per the present schedule which envisages the completion of erection of the first blast furnace complex by December, 1971 and the entire stage-I of the plant by March, 1973. The rate of work has recently been significantly stepped up, and it is hoped to complete stage-I on time. However, various constraints imposed by the limits of industrial and technological developments within the country and the prevalent labour situation can lead to unexpected developments which to their very nature are difficult to take into account.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971]

Recommendation (Sl. No. 14)

The Committee have found that the price of many of the supplies to Bokaro from indigenous sources and also their time of delivery have not yet been decided upon particularly with regard to the supplies from public sector units. The Committee would like that this matter should receive most immediate attention and should be settled as early as possible.

(Para 4.9)

Reply of Government

Contracts/orders have been finalized for supplies from public sector undertakings. These contracts/orders include the delivery schedule and the prices. Only in respect of M/s. Mining and Allied Machinery Corporation, the issue of price awaits firm quotation from them for all the equipment.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971.]

Further information called for by the Committee

Has the Contract with M/s. Mining and Allied Machinery Corporation been finalised ? If not, what are the reasons for the delays ?

[L.S.S. O.M. No. 12-PU/70, dated 15-9-1971.]

Reply of Government

The Contract between Bokaro Steel Ltd. and Mining & Allied Machinery Corporation was concluded on the 6th December, 1968, with a provision that the price will be settled later. While general agreement on major issues relating to price question has now been reached certain aspects are still to be resolved mutually. The discussions between the two Companies are expected to be concluded in two to three week's time.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(5)/70 dated the 24th April, 1971.]

Recommendation (Sl. No. 16)

The Committee have found that BSL are very unhappy by the imposition of the contracting from HSL on them. They feel that there has been unnecessary duplication of supervision work and consequent employment of duplicate supervisory staff. This has also resulted in delay in the execution of the work. BSL pleads helplessness in the situation to get the work executed according to their time schedule.

On the other hand the Committee have found that Hindustan Steelworks Construction Ltd. has mostly sub-contracted the work and are not doing the work themselves. The original idea was that HSCL would do the job themselves and not sub-let the work.

The Committee feel that this experiment has not worked well, on the other hand it has worked to the detriment of BSL. BSL should have freedom to get their work done in the most expeditious and economic manner as they deem fit so that the management of BSL may be held responsible both for the completion of the project within the time schedule and for getting the work done on estimated costs. This was not possible if a public sector contractor like HSCL is forced upon BSL. Therefore, the Committee feel that BSL may be allowed to get their civil and other works done themselves either departmentally or through a contractor of their choice.

(Para 4.22)

Reply of Government

Construction organisations have existed in the three steel works at Bhilai, Durgapur and Rourkela from 1956. HSCL was created only to give a form and separate identity to this process and to undertake construction work on all future steel-works. It was not the intention of Government that the construction company would right from the beginning undertake all major construction work for the steel plant; this was only an objective to be achieved gradually and in selected areas. A new organisation can, in any case, not be expected all atonce to take on, departmentally, construction work of the magnitude and complexity involved in building a large steel plant. It is also common practice even among

well organised construction contractors in the private sector to engage sub-contractors. However, HSCL has stepped into several areas such as cooling pond and underground communication work where its contractors have failed and has tackled specialized work successfully. Furthermore, HSCL have been recently taking up works departmentally, particularly in the erection of mechanical equipment. In recent months, the existence of HSCL has definitely helped the speedier construction of Bokaro and the Bokaro management itself has actually transferred the erection of equipment from other contractors who have failed and employed HSCL increasingly as a specialised agency for execution of erection.

It may be added that the experience gained by HSCL in the construction and erection of a steel plant at Bokaro will be an asset in the construction of the new steel plants. In fact, HSCL have already been associated with the selection of site for the new steel plants.

To a certain extent duplication of supervision is inevitable as Bokaro management has to own and discharge their direct responsibility for completion of work in accordance with the prescribed specifications. However, the extent of such duplication is confined to very limited and essential areas.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971.]

Recommendation (Sl. No. 17)

The Committee appreciate the objective with which the HSCL was formed, namely to take the construction of steel plants to solve the problem of the constructional staff and also to develop experience and expertise in civil and engineering work of this nature. But the Committee feel that this cannot be allowed to be done at the cost of a project, in this at the cost of Bokaro, the primary objective should be to get the project completed in time and according to the cost estimates and if that is put in jeopardy, HSCL has to be withdrawn.

(Para 4.23)

Reply of Government

HSCL have now diversified their activities in the sphere of main steel plant construction, viz., erection of mechanical equipment and materials, besides civil engineering and structural steelworks. They have successfully undertaken erection work in the blast furnace complex and the steel melting shop and these are being done departmentally. It is expected that they would assume greater and more useful responsibilities in the implementation of stage-II.

It will not be correct to say that the functioning of HSCL as the main contracting agency for civil and structural engineering work has, in itself, hindered progress in any way. In actual experience, contrary has been the case.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971.]

Recommendation (Sl. No. 19)

The Committee feel that such a vital and technical contract document ought to have been either drawn up by competent qualified technical man or vetted by them before signing. The Committee find that Dasturco has made comment on such omission in the contract. If the Government had made use of their experience in drawing up the contract, probably this omission could have been avoided. The Committee recommend that this should invariably be borne in mind in entering into contracts in future with the suppliers of plant and machinery. (para 4.35)

Reply of Government

The contract was drawn up by competent persons who had experience of drawing up similar documents earlier. The technical persons were also associated with this work. It has also already been explained that the absence of the mention of the component-wise delivery schedule or detailed schedule for submission of drawings was not through oversight or an omission.

It is relevant to mention that Bokaro Steel has a contract also with Dasturco for supply of working drawings. This contract also does not mention any time schedule with a sequence for supply of drawings.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971.]

Recommendation (Sl. No. 20)

The Committee regret to note that it took BSL and HEC a period of 18 months from the date of placing of letter of intent to clarify the specifications, to give the working drawings and to settle the delivery schedules. The Committee fail to get a satisfactory answer from BSL and HEC for this inordinate delay. During this period the Secretary of the Ministry of Industrial Development and Company Affairs was also the Chairman of BSL. It was expected that such a combination of posts would lead to better coordination and expeditious disposal and settlement but instead it took so long for these two public sector undertakings to settle these matters.

The Committee cannot help expressing their distress that the concerned Ministries failed to take any effective steps and to provide necessary leadership to streamline the work of these two corporations so that the loss of time and money could be avoided.

(Para 4.47)

Reply of Government

The representatives of HEC were associated with the discussions on division of supplies for Bokaro between USSR and India. Subsequently discussions were held with the representatives of the public sector industries, including HEC, for deciding the type of equipment and their quantities that could be ordered on them. On the basis of these discussions, the scope of supplies from HEC amounted to 111,105 tonnes including equipment, structures and machine tools. BSL forwarded a delivery schedule required to HEC on 30-6-1967. However, the specifications available at that time were indicative only and not detailed enough for manufacture to start. In October, 1967, HEC submitted a revised delivery

schedule. This was again discussed in details and on the basis of these discussions, a delivery schedule was forwarded by Bokaro Steel to HEC on 23-11-1967. HEC had to further revise this in April, 1963. Further discussions were held to finalise these revisions and the revised delivery schedule was forwarded to HEC on 14-8-1968. With certain modifications made in December, 1968, this schedule was incorporated in the contract signed on 9-4-1969.

HEC were unable to finalise the delivery schedules earlier, mainly due to the fact that the manufacturing drawings which had to be received from the USSR came in bulk at different points of time in 1967 and 1968 and it took HEC considerable time in sorting out these drawings in the proper sequence and in translating them in terms of Indian norms, etc.

A very close follow-up at the management level by way of periodical meetings is being made particularly with reference to supplies to BSL. The manufacture of a number of items is being taken up for the first time and as such certain manufacturing and technological problems came up which affect the manufacturing schedule. Moreover, there have also been failures in timely suplies in a number of cases for the items ordered on trade.

It is conceivable that the process of finalisation of the delivery schedule could have been completed more expeditiously but it should be mentioned that half of the detailed drawings for equipment were received by HEC only by June, 1968 and a realistic estimate of workload cannot be made in the absence of such detailed drawings.

The Chairman of BSL who was also the Secretary in the Ministry of Industrial Development & Company Affairs made repeated efforts towards the finalisation of the contract between BSL and HEC. Besides negotations at the top management level between BSL and HEC, discussions were held at the Government level also in the Ministry of Industrial Development and Company Affairs when issues relating to deliveries and prices were negotiated. High level discussions were also held both in India and USSR with the Soviet organisations in order to finalise the delivery of components from USSR to HEC to enable HEC to indicate the firm delivery schedules to BSL.

As already mentioned, HEC has since been placed under the Ministry of Steel & Heavy Engineering to provide for better and closer coordination between the two undertakings.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971.]

Recommendation (Sl. No. 22)

The Committee have noted with concern that MAMC have failed to keep up even their revised and scaled down delivery schedule. As against 4,650 tonnes to be supplied by the 1st quarter of 1970, they have supplied only 700 tonnes upto 25-2-1970. The Committee have examined this year the working and performance of MAMC. They have an impression that MAMC will not be able to make supplies according to their commitments. Therefore, BSL will be better advised to seek alternative sources of supply in order to ensure that their own construction schedules do not get delayed on account of failure of MAMC.

(Para 4.50)

Reply of Government

There have no doubt been initial failures on the part of MAMC. The management of MAMC, has, however, been strengthened. MAMC have also taken steps to off-load some of the items, which were not likely to be available in time from their own production. Upto February, 1971 they have already delivered 3,710 tonnes of conveyor equipment to BSL. It is felt that seeking alternative sources of supplies at this stage would not improve the situation as developmental and partial work has already been completed by MAMC on nearly all the items. In the circumstances, the only remedy is to tone up the management of MAMC which Government is trying to do with all the limitations of a troubled situation on the labour front, MAMC is trying to do its best in pursuing the objective of speeding up delivery of conveyors and pumps to Bokaro so as not to hold up the completion of the construction of the plant according to schedule.

[Ministry of Steel & Heavy Engineering O.M. No. T-25(8)/70 dated the 24th April, 1971.]

Recommendation

The Committee find from the information received from BSL that the position of the supply of cranes is very precarious. As against 210 cranes which were to be received in the first quarter of 1970 only 24 cranes have been received/despatched. This is bound to affect adversely the construction programme at the site.

The Committee would like that it be examined and reported to the Committee whether orders for the supply of cranes were placed in time and if there were delays in placing of orders what were the reasons therefor.

The Committee would also like to be informed the reasons for delays in deliveries by the suppliers and who are the suppliers who have failed to honour their commitment of delivery.

(Paras 4.51 to 4.53)

Reply of Government

The position of supply as on 28-2-1971 of the 480 cranes required for Bokaro stage-I is detailed below :

Sl. No.	Sources	No. of cranes ordered	No. of cranes despatched	Remarks
1	2	3	4	5
1.	U.S.S.R.	19	18	1 No. has been recently ordered.
2.	Public Sector *a.* H.E.C.	96*	16	By the fourth quarter of 1970, HEC were to supply 86 cranes.
	b. Garden Reach Workshops.	23	5	By the 2nd quarter of 1970, all the cranes should have been despatched. 2 cranes are under despatche

*Out of 96 cranes on HEC, they have planned supplies as follows: USSR—5; GRW—61; Private Sector—7; HEC—23.

1	2	3	4	5
3. *a*	Tungabhadra Steel Products Limited .	3	2	One is under despatch. By the 3rd quarter of 70 all the cranes should have been despatched.
b.	Maharashtra Small Scale Industries Development Corporation Limited .	58	—	3 cranes recently ordered.
4.	Private Sector	262	115	
		461	156	
	Balance to be ordered . . .	19		
		480		

Tenders for placement of orders for the cranes were issued in time after receipt of the ordering specifications from the consultants. However, a number of firms in their tender offers asked for price variation on account of material cost and/or wages. The terms stipulated by the various firms differed from one another. A standard escalation formula for escalation on the cost of materials and wages had, therefore, to be evolved. The orders were finalised as soon as this could be decided after discussions with them. Most of the firms took some time to submit the drawings after the placement of orders. These had to be checked before these could be cleared for manufacture. Almost all the crane manufacturers further experienced difficulties in getting tested and special quality steel. Assistance is being given to them in obtaining priority for the supply of steel and also by releasing steel from BSL's own quota, wherever possible. There have been difficulties also in the supply of electrical components. There are a few reputed suppliers of electrical control equipment for cranes. Since almost all the crane suppliers are depending upon these firms for the supply of control equipment, difficulties in timely supply of these have also led to delays in the delivery of cranes. This problem has been tackled by assisting the crane manufacturers in import of certain control gears and also by persuading the suppliers of electrical control equipment to give priority in the supply of this item to crane manufacturers on whom orders have been placed by Bokaro.

The heavy cranes, particularly those ordered on USSR and HEC, are required also for erection of equipment, mainly in the steel melting shop and rolling mills. All the cranes ordered on USSR have already been despatched and most of these have reached the site also. Some of the cranes from HEC have also been received. By and large availability of cranes is such that it would not now adversely effect the construction programme.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971.]

Recommendation (Sl. Nos. 25 & 26)

The Committee have noted with distress the supply position of refractories. We have now long experience in the manufacture of refractories required by the steel plants. The decision to make India self-sufficient in

regard to refractories was taken long ago. They regret to note that for our fourth steel plant we had to depend upon imports of refractories of 46,854 tonnes against the total requirement of 198,000 tonnes for Bokaro's first stage, *i.e.*, for about 24% of the total requirements of although originally it was estimated that 96% of the refractories will be procured from indigenous sources.

The main point that has been urged to justify import of refractories is that the stringent specifications required for Bokaro could not be met from indigenous supplies. The Committee feel that these specifications were known from the very date the decision was taken to build Bokaro. It is evidently a failure of proper planning in time and lack of forethought on the part of BSL and of initiating action early enough to get the stringent specifications of refractories manufactured in India, that has resulted in their importation. Refractory is not to be used once but has to be replaced periodically. Therefore, their manufacture in India according to the specifications is a must in the long run. If action was initiated in years 1965-66 for their manufacture there is no reason why they could not have been manufactured in India according to the specifications.

The Indian Refractory Makers' Association have represented that they were not apprised of the specifications and quantity of refractories required sufficiently in advance. They were told about the specifications only at the time of inviting tenders. BSL ought to have conducted a survey of manufacturing capacities and the competence of the refractory manufacturers quite early enough in 1966-67 in order that the necessary remedial actions could be taken to ensure supplies of requisite quantity and quality.

India has enough experience and expertise in the manufacture of refractories which industry has now been in existence for large number of years. The total dependence upon Russian expert advice even in the matter of refractories does not speak well of our long standing in this industry and also of our experience in the steel industry. The Committee would have better appreciated if we had depended on our own steel experts in the matter of rejections or acceptance of refractories. The Committee deprecate this tendency to blame the foreign collaborators for our own failures and shortcomings.

(Paras 4.65-4.66)

Reply of Government

The Committee has observed that the specifications of refractories required for Bokaro were known from the very date the decision to build Bokaro was taken and has proceeded to express the views on the subject of supply of refractories on this assumption. This is, however, not true. While the broad categories of refractory required for the establishment of a steel plant were, no doubt, known and the detailed project report prepared by the consultants also indicated the broad categories of refractory required for the different units and the approximate quantities thereof, these details were not adequate for calling for tenders and placement of orders. The Indian refractory manufacturers would have required precise physical and chemical properties and the shapes of refractories needed. These details became available to BSL from the Soviet consultants only after the submission of the working drawings and ordering specifications. The Soviet consultants started working on these after the conclusion of the contract in May,

1966 appointing them as the general designer and consultant of plant designing. The Indian Refractory Manufacturers' Association could not, therefore, have been apprised of the specifications and the quantity of refractories required earlier than the receipt of the working drawings and ordering specifications. The tenders for the bulk of the requirement, *i.e.*, coke ovens and blast furnaces were invited as soon as the working drawings and tendering specifications became available.

The decision to obtain 96% of the refractories from within the country was based on the examination of the broad categories of refractories indicated in the DPR submitted in December, 1965. The representatives of the DGTD who were associated with the discussions on the division of supplies between USSR and India advised on the categories of refractories which could be manufactured in the country on the basis of the information contained in the DPR. Only such categories of refractories for which the capacity had not been created in the country till then were earmarked for supply from USSR. The Indian refractory industries had developed the capability to manufacture refractories of the specifications required by the steel plants already set up in the country. It was observed that the specifications of refractories required by Bokaro were more stringent than any manufactured till then including those for Bhilai. It would thus be observed that the decision to initially procure as much as 96% of the refractories from within the country was justified on the basis of the information available at the time.

While on this subject it cannot but be mentioned that the Indian refractory manufacturers have, with few exceptions, failed to make earnest and genuine endeavour to meet the required specifications. At the time the tenders were invited, refractory industry was passing through a period of recession and they eagerly accepted the orders fully conscious of the specifications of the refractories required for Bokaro. Initially the manufacturers had to encounter higher percentage of rejections before the production could stabilise. This was high-lighted by them out of all proportions obviously to cover up their own shortcomings. As there was considerable failure in adhering to schedule by many of the manufacturers, the periodical reviews with the suppliers and the Indian Refractory Makers' Association revealed that import of larger quantities of refractories had to be resorted to if the construction schedule, even taking into account the revisions, had to be maintained. Moreover, the failure of the refractory manufacturers to fulfil the orders accepted by them resulting in the need for import was not in all cases due to their failure only to meet the specifications. With the passing of the resession and rise in the tempo of industrial activities, the demand for refractory from sources other than Bokaro picked up. The refractory manufacturers, with a few exceptions, neglected to make supplies to Bokaro and diverted the same capacity for meeting the supplies against subsequent orders obtained by them at higher rates from other sources.

The Committee has drawn the conclusion that there has been unjustified dependence on the advice of the Soviet experts in the matter of refractories required for Bokaro. The Soviets are the principal consultants for Bokaro and are responsible for guaranteeing the performance of the plant. The services of Soviet experts have been utilised also for extending technical guidance to refractory manufacturers. The refractory manufacturers and their Association have high-lighted out of all proportions the effect of rejection of some of the bricks on the ground of hairline cracks and leak-

Initially the rejections were high since the manufacturers themselves had not achieved the necessary technique. However, while hairline cracks and iron spots were not of much consequence where the temperature requirements were low, these could not be regarded as insignificant with the requirements in respect of temperature being higher. The inspections were made principally by the Indian experts of Bokaro assisted by the Soviet experts.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971.]

Recommendation (Sl. No. 30)

The Committee find that the Board of Directors of Bokaro, whether the present one or the previous one, were constituent of directors who may be called 'birds of passage'. Excepting the Managing Director none of them has got responsibilities of execution and the career of none of them is dependent upon the success or the failure of the Bokaro. The Committee consider that the concepts of (i) making the fortunes (career) of Directors fully identified with the failure or success of a project (ii) including in the Board a team of the top functionaries at the project instead of having only the Managing Director; and (iii) importing an element of heirarchy in that functional team should be properly examined and given effect to in the constitution of the Board of Directors for public enterprises.

(Para 5.11)

Reply of Government

The Board of Directors of BSL has been constituted carefully and consists of persons having long experience in industry. Some of them have experience in the metallurgical industry. Their competent advice has been of assistance to the Board in tackling various complex problems. The Directors representing the Ministry of Steel & Heavy Engineering, Ministry of Finance, the State Government of Bihar and the South-Eastern Railway, have been chosen with the purpose of ensuring that advice and cooperation of all concerned Government agencies is available for the administration and the progress of construction of the company.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971.]

Further information called for by the Committee

Please intimate the action taken by Government on the following general recommendation of the Committee.

"The Committee consider that the concepts of :—

(i) making the fortunes (career) of Directors fully identified with the failure or success of a project,

(ii) including in the Board a team of top functionaries at the project instead of having only the Managing Director, and

(iii) importing an element of heirarchy in that functional team should properly examine and given effect to in the constitution of the Board of Directors for public enterprises."

[L.S.S. O.M. No. 12-PU/70, dated 15-9-1971.]

Reply of Government

A general discussion has already been taken by Government that the constitution of the Board of Directors of Public Sector Companies should be thoroughly reviewed each year in the light of their performance. Necessary changes are made at the time of reconstitution of the Board at the end of each Annual General Meeting.

On the recommendation of the Administrative Reforms Commission, Government have decided that in the larger units, full-time functional Directors may be appointed, who will be executive heads of their Departments. The pattern of working will be somewhat on the lines of the Railway Board. Government recognise that there should be suitable decentralisation of powers not only between Government and the Board of Directors, but within the undertaking itself.

The Bokaro Steel Plant is still in the construction stage. There is a whole time Chairman-*cum*-Managing Director for the Company. The appointment of Functional Directors as Executive heads of departments will be considered when the plant goes into operation and its field of activities expands to cover sizeable functional areas.

[Ministry of Steel and Mines, Department of Steel, O.M. No. B-25(5)/70 dated the 24th December, 1971.]

Recommendation (Serial No. 33)

The Memorandum/Article of Association of BSL may be suitably amended to provide that any director who has absented himself for more than two consecutive meetings without taking leave of absence ceases to be a member of the Board.

(Para 5.14)

Reply of Government

The Articles of Association of Bokaro Steel Limited provides that the office of a director shall be vacated if he absents himself, without leave of absence from the Board of Directors, from three consecutive meetings of the Directors or from all meetings of the Directors for a continuous period of three months whichever is the longer. In view of this provision, no amendment to the Articles appears necessary.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971.]

Recommendation (Serial No. 38)

The Committee find that the management of itself invited the staff inspection unit to undertake a study of staffing of the company as it was felt that a study by an independent and specialised organisation like SIU would be useful to suggest norms and standards for assessment of workload and the requirement of staff. Consequently, the Committee are surprised over the statement by the Secretary of the Ministry and of the Managing Director of BSL that SIU were not competent and experienced enough to do the job and therefore they were unable to accept and implement the recommendations of SIU. The realisation about the competence of SIU has come to them after the Report was finalised and submitted and when

they have found that SIU have adversely commented upon the staff strength and pattern. The Committee do not agree with the view that such a review was not necessary 'during the formative stages of a project by an independent authority'. On the other hand the Committee feel that there should be a proper review regarding the employment of staff/workers in all categories by an independent and qualified industrial management expert in order to determine that there is proper utilisation of the working force and there is no overstaffing at any point so that the construction could be completed both economically and efficiently.

(Para 5.35)

Reply of Government

The study of the manpower requirements in a steel plant is a highly technical job and also warrants continuous study. It also presupposes an intimate knowledge of the working of the different departments and its processes. Accordingly all steel plants have regular industrial engineering departments which study job contents and workloads on a continuing basis. The advantages of regular industrial engineering study cannot be had in a study which may be made by an outside agency. The independence of the industrial engineering department is ensured by suitable organisational arrangements. A regular industrial engineering department is conceived in the over-all manning pattern of Bokaro steel plant and the same is functioning even at the construction stage.

The work on Bokaro plant commenced in right earnest only from the middle of 1966 after finalisation of the DPR and conclusion of contracts with the Soviet suppliers for supply of equipment and materials from USSR. The civil engineering work was scheduled to commence from January, 1967. The organisation had, therefore, to be geared up to cope with the task. For reasons already explained to the Committee, HSCL commenced the civil work only from October, 1967. The anticipated workload in the early part of 1967 did not therefore actually develop as had been anticipated. In the context of this, the management of Bokaro Steel considered it appropriate to assure itself that in the course of recruitment of staff there had been no overstaffing. As this involved mainly work study of the construction personnel and no industrial engineering of an operating plant and the company's own work study department was in the process of development, it was thought that the SIU of the Government of India could make this study. They were requested also to determine the projected need of personnel during the construction stage.

However, when the unit undertook the study it became apparent that they had inadequate experience of conducting workstudy of the nature required for a steel plant and were also not staffed suitably to do this work. Having accepted the assignment, the SIU itself avoided assessing the projected need of personnel during the construction stage as they obviously found the latter beyond their capability. From the perusal of the report of the SIU it would be apparent that they have merely examined the justification of the existing work force by adopting the norms and standards followed by the company. In view of this, it was considered that their report was not a scientific appraisal.

In the light of the above remarks, the recommendation of staff inspection unit could not be accepted.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971.]

Further information called for by the Committee

It has been stated that the advantage of regular industrial engineering study cannot be had in a study which may be made by an outside agency. On the other hand it is noticed that the HSL entrusted the job of conducting the detailed manning studies in the three Steel Plants to the Consultancy and Applied Research Division of the Administrative Staff College, Hyderabad in connection with the revision of their incentive schemes.

In view of the divergent views of the two public undertakings under the control of the Ministry, please intimate the considered view of Government regarding the desirability of having such studies conducted by outside agencies.

[L.S.S. O.M. No. 12-PU/70, dated 15-9-1971.]

Reply of Government

The advantages of regular industrial engineering study in relation to manpower by an outside agency for operational needs of a project cannot be disputed. What was stated in the Government's reply in relation to Bokaro Steel Ltd. was in respect of study by Staff Inspection Unit of the Ministry of Finance when the plant was under construction and when no regular industrial engineering study in regard to its operation was involved. In fact even in respect of Bokaro, Administrative Staff College, Hyderabad is at present conducting a study to assess the manpower requirements for each individual operation unit.

[Ministry of Steel & Mines, Department of Steel, O.M. No. B-25(8)/70 dated October 16, 1971.]

Recommendation (Serial No. 46)

Originally Bokaro Steel was to be financed out of the foreign aid from USA, but this request had to be withdrawn because of the opposition in the US Congress. Then the Government of India received offer from USSR for financial and technical aid for setting up the BSL. The USSR Government offered credit upto Rs. 166.6 crores on a liberal terms bearing an interest of only 2.5% repayable in 12 years.

As a consequence of this offer a DPR was prepared by the Soviet collaborators and submitted to the Government. The Committee find that M/s. Dasturco who were the general consultant of the Ministry were sidetracked and according to Dastur he was not associated in the technical discussions with the Soviet collaborators in August, 1964 and thereafter which had important technical implications and ultimately resulted in a high cost project. The DPR submitted by the Soviet collaborators was no doubt examined by a big technical committee consisting of 22 persons. But this examination of the 28 volumes of the DPR was done in hardly a month's time. The Committee feel that the DPR deserved a far greater scrutiny and that it was not given a proper technical appraisal on the basis of which investment decision of over Rs. 600 crores ought to have been made.

The Committee feel that the examination of the DPR by a technical committee can normally provide a second opinion. Effective scrutiny by

the nature of work itself can only be made by a closely coordinated, competent, consultancy organisation, DPR has to be reviewed not piecemeal with loose association of pieces but as an integrated project report.

(Paras 7.2—7.3)

Reply of Government

It has already been submitted earlier in reply to para 2.13 that Dasturco were the general consultants of the Steel Ministry in 1964, but they were not the consultants of BSL at that time. Discussions which BSL had with the Soviets were mainly for the purpose of settling certain details. The association of Dasturco with such discussions was not considered necessary. These discussions did not have any major implications and non-association of Dasturco with these discussions did not result in boosting the cost of the project.

It has also been submitted earlier that the DPR submitted by the Soviet consultants was effectively scrutinised by a broad-based technical committee and that it is not usual for a detailed project report prepared by one consultant to be entrusted to another consultant for scrutiny before acceptance. In fact, the best course was adopted in having the project report examined by a technical committee of the best available experts. The Soviet DPR was reviewed in depth and in an integrated manner and not piecemeal.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70 dated the 24th April, 1971.]

Recommendation (Sl. No. 47)

The Government finding the cost of the project as submitted by Soviet collaborators as very high, commissioned M/s. Dasturco for a cost reduction study. But before even setting such a cost reduction study report from Dasturco the Government signed agreement, with the Sovie collaborators for the supply of equipment, drawings and for rendering technical assistance. M/s. Dasturco were given only 7 weeks time to produce a cost reduction study on this voluminous report, which they produced suggesting a cost reduction of Rs. 107.5 crores in the 1st stage. Dasturco however prefaced this report stating that due to the very limited time available only major items of reduction are indicated and further scope for cost reduction exists, and could be realised by continuing study and implementation during the engineering and construction of the plant. The Soviet proposals on technology and equipment are retained as far as possible and changes suggested only where the resulting benefits were substantial. According to BSL this cost reduction study lacked detailed technical design basis, detailed cost calculations and break-up of cost savings. However, without obtaining the required intormation from M/s. Dasturco and without studying in detail the suggestions made by them, the Government sent a delegation to Moscow to discuss these proposals with the Soviets. The Committee find that no serious worth-while effort was made to reduce the cost and ultimately a reduction of only Rs. 9.5 crores was obtained. The Committee have found that the negotiations with the Soviets were rushed through. The Committee feel that Government ought to have insisted on having enough time for consideration of the DPR and other connected matters and not allowed themselves to be stampeded into entering important agreement without proper and detailed scrutiny.

The Committee are constrained to observe that while on the one hand in the preparation and the execution of the project there has been inordinate delay resulting in burdening the project with considerable increase in the capital cost, on the other hand on critical occasions when through careful scrutiny considerably economy could have been achieved, decisions were arrived at with unconscionable haste.

(Para 7.4)

Reply of Government

It is not correct that the Government on finding the cost of the project as submitted by the Coviet collaborators to be very high, commissioned Dasturco for a cost reduction study. On the other hand, the fact was that the Government on the basis of the report of the technical committee, the recommendations of the Board of Directors of BSL and on the basis of the report of Ghei Committee were satisfied that the estimates were reasonable for the project. However, since Dasturco continued to maintain despite their association with the technical committee, that further scope for cost reduction existed, they were given another opportunity to make such suggestions as they could offer. As already explained, they were given reasonable time to submit their proposals if it is borne in mind that Dasturco's representatives had already studied the proposals in the technical committee in some detail. Opportunities were given to Dasturco also to discuss their proposals with the Soviet consultants in USSR. The Soviet experts who have much wider experience of steel technology disagreed with the proposals of Dasturco. The economies suggested by Dasturco were found to be exaggerated and lacked adequate technical design basis. It will not be correct to conclude that the Government were stampeded into entering into contracts, as the conclusion of these contracts were preceded by detailed negotiations in which all concerned were associated.

While it is a fact that some delays have taken place in the execution of the project due to factors which have already been explained, it is not correct to conclude that on critical occasions decisions were arrived at with unconscionable haste. Detailed and mature consideration were given to all proposals before finalisation.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70, dated 24th April, 1971.]

Recommendation (Serial No. 50)

The Committee find that in the case of Bokaro Steel Plant, the Government/B.S.L. management depended heavily on the advice of foreign collaborators. It was decided to call for another D.P.R. from the Soviet although Government already had a D.P.R. prepared by M/s. Dasturco because according to the Chairman, B.S.L. "there was undoubtedly Russians insistence that they would do the D.P.R. themselves". It was proposed in 1964 to appoint M/s. Dasturco as principal consultant for Bokaro Steel Ltd. and this was also announced in Lok Sabha on 9th April, 1964. But this position was reversed and the Soviet collaborators were appointed as principal consultants because the Committee were told that 'Soviet authorities were not willing to accept Dasturco as principal consultant for the project and they said, that they must remain in full and final authority of the project although they would associate Dasturco, and this fact was told

to the Secretary of the Ministry and the Ministry concerned' although the Committee could not get any written evidence to confirm this insistence of the Soviet collaborators. Again M/s. Dasturco suggested in their reduction study that it was possible to effect savings to the extent of Rs. 107.5 crores in the first stage of Bokaro even if the basic assumptions in the Soviet D.P.R. were accepted. But savings to the extent of only Rs. 9.5 crores could be given effect to because according to the Chairman, BSL the position was that 'the Russians were the primary consultants for this project and we were not in a position to say that whether they liked it or not we would act Dastur's line of thinking'.

India has enough experience of steel industry. Apart from two steel plants in the private sector set up years ago, the Government had experience of setting up three steel plants in the public sector. The forth steel plant at Bokaro was to be set up largely on the basis of experience available in India and the bulk of its supplies were also to come from the indigenous sources. Dr. Dastur was brought to India and M/s. Dasturco commissioned as a steel consultant for B.S.L. The Committee, however, find that for setting up Bokaro, the Government had heavily relied upon foreign know how and expertise which is now being supplied by the Soviet collaborators. Dasturco from being the principal consultant were reduced to doing consultancy work only in respect of indigenous supplies from private sector and the major responsibility for setting up of the Bokaro was taken away from the Indian hands. The Committee are not opposed to having assistance/advice from foreign collaborators but Government should never abrogate its right of taking final decision in such matters taking into consideration all the relevant factors including the available advice of Indian experts; and having taken certain decisions after examining all pros and cons they should not feel shy of owning the responsibility for such decisions instead of blaming the foreign collaborators.

The Committee feel it is the Government's responsibility that the foreign aid available on liberal terms from friendly countries is put to use. There is no justification for accepting any project report which the Government is not satisfied is in the best interest of the country only on consideration of making use of liberal terms of foreign aid. The Committee, therefore, are not happy to note from the statements of the Chairman BSL and the Secretary of the Ministry that they were more or less compelled to accept the position because they were obliged to do so by the country giving foreign aid.

(Para Nos. 7.7 to 7.9)

Reply of Government

The experience in India of large scale construction and expansion of steel plants is mainly confined to the period from the Second Five Year Plan and onwards. The two plants in the private sector were expanded with considerable technical assistance of foreign agencies. The 3 steel plants in the public sector were initially set up almost entirely with foreign technical collaboration and subsequent expansion was engineered by the CE&DB of HSL. For the setting up of the 4th steel plant at Bokaro it was found from the initial stages that foreign technical assistance in respect of technical know-how and supply of equipment and materials could not be entirely dispensed with. It was in this context that negotiations were initiated with the Government of USA for assistance in the setting up of

this plant. Consequent upon withdrawal of this request, it was, no doubt, intended to proceed with the setting up of the plant with Dasturco as the consultant and such credits as equipment suppliers from overseas could offer. This alternative was, however, regarded as the only choice under the circumstances then prevailing but certainly not the best. In this context, when the Soviets offered financial aid and technical collaboration, this was accepted by the Government. As the Soviet side had to design the plant to suit Soviet technology and equipment for reasons already explained and they were consequently to guarantee the performance of the plant on the basis of their design and principal items of equipment, they had to be appointed as the principal consultants. Though Dasturco had prepared a preliminary project report and subsequently a DPR, they had not in fact been appointed as consultant for Bokaro and under the changed situation they could not be assigned this role. Nevertheless, best efforts were made to secure as much designing work for the Indian side as feasible and these were awarded to Dasturco. In taking decisions on these important matters, the Government were principally guided by the considerations relating to speedy and efficient execution of the project and were not exclusively influenced by the advice of Soviet experts ignoring the views of the Indian experts.

The experience of designing a complex steel plant in the country is limited. The technology has developed fast, which is not identical in all the countries. The design of equipment manufactured in any country is an important consideration influencing the overall project planning. In this context, the collaborators were, it is considered, justified in insisting on designing the plant based on the technology and equipment available from their country.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70, dated 24th April, 1971.]

CHAPTER IV

RECOMMENDATIONS IN RESPECT OF WHICH REPLIES OF GOVERNMENT HAVE NOT BEEN ACCEPTED BY THE COMMITTEE

Recommendation (Sl. No. 9)

The Committee also find that in the Demands for Grants for 1967-68, it had been stated that after taking into account the effects of devaluation and proposals of cost of 1st stage of the plant as sanctioned by Government is Rs. 620 crores (excluding off-site facilities which are estimated to cost about 50.4 crores of rupees approximately). Having obtained the approval of Parliament to specified figures, the management was committed to complete the first stage of Bokaro within that amount unless Parliament had approved of the revised estimates. The Bokaro Steel Ltd., should have taken the first opportunity of informing Government and Parliament about the extent of revision in the estimates stating also clearly as to how it would affect the economics of the plant. They, however find that even the Demands for Grants for 1970-71, made no definite mention about the extent to which the increase in estimates was likely to be. The Committee highly deprecate the complacent attitude of the Government towards the escalation of estimates to such a magnitude (Rs. 90 crores) and they recommend that in future earliest opportunity should be taken to inform Parliament about major increases in estimates of a project.

(Para 3.40)

Reply of Government

The revised estimates are under the consideration of Government in the light of consultation with Ministry of Finance on an appropriate equity-debt ratio for this project and formal sanction in regard to revision to the project estimates has not yet been issued. As soon as a decision is taken, an early opportunity would be taken to inform the Parliament about the final revision to the project estimates. However, Parliament have been kept informed about the likely revision in the cost estimates of BSL. In this connexion, attention is invited to Rajya Sabha Unstarred Question No. 429 dated 2-3-1970, Lok Sabha Starred Question No. 708 dated 31.3.1970, and Lok Sabha Unstarred Question No. 5450 dated 7-4-1970.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70, dated 24th April, 1971.]

Comments of the Committee

Please see paras 1—4 of Chapter I of the Report.

Recommendation (Sl. No. 13)

As a result of the delay in the completion of the stage-I even by 27 months, the Committee very much regret to note that the losses amounting to Rs. 32 crores on account of production and establishment cost at the rate of Rs. 25 lakhs per month which will in 27 months amount to Rs. 6.75 crores have become unavoidable. It may, however, be noted that if the target date of completion of June, 1973 is not adhered to

the loss will be still more. The main reasons for these losses are primarily due to be belated submission of technical datas, drawings, cranes, delay in civil engineering work and supplies from private and public undertakings. Apart from these the Secretary of the Ministry has also admitted during evidence that "there have been some organisational failures on the part of BSL." which failure is not responsible for the above mentioned losses. The Committee were informed that steps have now been taken to remedy those organisational failure by adopting a system of network analysis by Dasturco which will show up the deficiencies at various points and which will also show how particular deficiencies can be by passed if necessary. In spite of the fact that Dasturco advocated the adoption of the modern techniques of planning by BSL as early as 1966, the Committee regret to note that the management at that stage ignored his advice and as a result the avoidable organisational failures crept into the management of BSL.

(Para 4.8)

Reply of Government

M/s. M. N. Dastur & Co. (P) Ltd. had not specifically proposed the adoption of a system of network analysis as claimed by them but had proposed inclusion in their contract of a general clause conferring on them the responsibility to check the progress and to point out if the progress did not appear satisfactory. Such a clause would have virtually made them the principal consultants. This could not be accepted as the Soviets were the principal consultants in accordance with the Inter-Governmental Agreement. Bokaro Steel itself had taken initiative as early as 1967 to devise means for the application of network planning and scheduling to the construction of Bokaro steel plant. A management group of experienced personnel from the Planning Commission was invited to assist in developing a master network. A suitable nucleus was developed within the company under a Dy. Chief Engineer to work on this. As the work developed, the need for further expanding this set-up was recognised and it was also realised that updating of the networks had to be computerised to keep the networks uptodate. It was also felt that for the increased work, the assistance of an outside agency could also be usefully employed. It was in this context that the services of Dasturco were secured under a contract entered into with them in February, 1970. It may, however, be added that Dasturco are not exclusively responsible for this work but are only sharing a part of the responsibilities. BSL continues to be responsible for collecting the data for preparation of preliminary network, checking the networks prepared by Dasturco, provide computer facilities for data sheets prepared by Dasturco, assist Dasturco in the periodical review of networks and in the issue of schedules by furnishing the necessary data.

As already explained, the postponements of the construction schedule from time to time have been due to factors largely beyond the control of BSL.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70, dated 24th April, 1971.]

Comments of the Committee

Please see paras 5—8 of Chapter I of the Report.

Recommendation (Serial No. 18)

The Committee regret to note that there had been delays both in the supply of drawings and equipment by the foreign collaborators. The inordinate delays in the supply of drawings has caused serious delays and upsets both in the civil construction programme and also in the manufacture of machinery and equipment in India.

It is also surprising that in respect of equipment supply, the contract with USSR stipulated only an overall period of fifty months for the supply of equipment, from the date of signing the contract and did not include a phased delivery schedule. The result was that while on the one hand the supplies were deficient to the extent of 10,000 tonnes for the first blast furnance complex, a large number of items of rolling mills required much later have already been supplied.

In order to ensure the supply of equipment in time and in the proper sequence required for construction and erection it was essential to include component-wise phased delivery schedule in accordance with the needs of the project. The Committee could get no satisfactory explanation for this omission in the contract entered into with the Soviet suppliers and would like it to be investigated into the responsibility fixed for such a vital omission which has caused considerable loss.

(Paras Nos. 4.33 to 4.34)

Reply of Government

The schedule of construction of the Plant was kept in view while finalising the contract/agreements for supply of working drawings, technical documentation and supplies of equipment and materails.

The contract with the Soviet suppliers for the supply of working drawings provides for the supply of drawings in the sequence in which they were required for construction work and the handing over of the last lot of the working drawings was required to be completed six months before the completion of the deliveries of the equipment, steel structures, refractories, pipes and materials. The working drawings have been generally supplied in the sequence of construction and the supply has been completed.

The contract for the supply of the technical documentation provides for the supply of manufacturing drawings for the equipment of 1st Blast Furnace complex within 9 months from the date of signing the contract and for the balance equipment within 24 months from the date of signing the contract. In this case also, most of the drawings have been supplied within the stipulated time.

Under the contract for rendering technical assistance in the construction of Bokaro steel plant, equipment and other goods under Soviet scope of supply were to be delivered within 50 months from the date of signing the contract, *i.e.*, by 3-7-1970. Under the contract, the date of the bill of lading at the port of loading is to be considered as the date of delivery of the equipment and other goods.

When in May, 1966, the contract with the Soviet suppliers for supply of equipment and materials was concluded, the detailed construction schedule had not been finalised except the broad decision that stage-I of the

plant including cold rolling mills would be completed by the end of 1970. A detailed construction schedule providing for the commissioning of the different units of the plant was finalised only in January, 1967. Accordingly, the component-wise delivery schedule in the contract with USSR could not have been indicated in May, 1966. This was also not considered very important as the Soviets were themselves the principal consultants and were equally responsible for ensuring that the supplies from their side were made in time to make it possible for the plant to be commissioned as per schedule.

The position of receipt of equipment and materials in relation to the contracted delivery schedule is as given below :

Contract 7622-OC	Total Qty. to be recd.	Receipt at Calcutta on 30-6-1970	Receipt at Calcutta on 30-9-1970
1. Equipment	101,502 T	84,228 T	89,130 T
2. Steel Structures	17,708 T	13,409 T	16,371 T
3. Refractories	4,310 T	2,617 T	2,699 T
4. Pipes and other materials	23,128 T	12,405 T	12,846

NOTE : (*a*) Quantity received at Calcutta port on 30-9-1970 may be taken as quantity shipped from Odessa on 30-6-1970 as it takes a ship about three months to reach Calcutta port from Odessa.

(*b*) Quantity against pipes and other materials may be considered to have been received 100% as the quantity of pipes shown in the working drawings, which is less than the quantity shown in the contract, has already been received.

(*c*) BSL has asked V/o Tiajpromexport to defer the shipment of balance equipment which are mostly for rolling mills so as to prevent deterioration at site due to prolonged storage.

The deliveries from USSR have been, by and large, satisfactory. The initial delays, if any, did not materially affect the revised construction schedule.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70, dated the 24th April, 1971.]

Comments of the Committee

Please see paras 9—13 of Chapter I of the Report.

Recommendation (Sl. No. 34)

The Committee regret to note that the Secretary of the Ministry of Iron & Steel was appointed as the Chairman of BSL on 4-2-1964 contrary to the decision of the Government taken as early as November, 1961 that "no Secretary of the Ministry/Department shall be a member of any Board", and in disregard to the recommendations of the Estimates Committee* (referred to in para 5.19) justifying the appointment of the Secretary as Chairman of BSL. The Committee are of the view that by combining the two posts in one person namely that of the Secretaryship of the Ministry and the Chairmanship of the Board of Directors the Government were denied an independent review of the whole negotiations and agreements between BSL and the Soviet collaborators. By appointing the Secretary

as the Chairman, the Ministry got indirectly committed by the agreement arrived at by the Chairman of BSL and thus the Government of India lost a valuable opportunity to improve the terms of the agreement with the foreign collaborators. In the opinion of the Committee if these two posts were not combined in one person and the advice of the Parliamentary Committee was followed and not disregarded, the Government might have had an opportunity both to improve the terms of the agreement and to say no such of the terms which on second review could have been found not to the advantage of the country. The negotiating parties lost a second tie of reference and final approval. The Committee feel that many of the defects discovered in the agreement and contracts with the foreign collaborators probably would have been rectified had these been given a second look by the Secretary of the Ministry, if he were not also the Chairman of BSL.

——— (Para 5.23)

Reply of Government

When the proposal for appointment of the former Secretary to the then Department of Iron and Steel as Chairman of BSL was mooted in 1964, it was considered that it would be advantageous to have the Secretary as Chairman of the new company *in its initial stages*, though following the recommendations of the Krishna Menon Committee, Government policy was to dissociate the office of Secretary to a Ministry/Department from the directorship of a Government owned company. However, considering that Bokaro would be the largest and one of the most complex to be undertaken by Government, there appeared considerable advantage in Government officials being directly associated with it and in establishing identity of interest between Government and the company. In negotiating credits, and other consultancy agreements, the association of the Secretary of the Department with the company as Chairman has avoided duplication of effort, and vested in such negotiations considerable authority.

As regards the observations of the Committee that many of the defects discovered in the agreement and contracts with the foreign collaborators probably would have been rectified had this been given a second look by the Secretary of the Ministry, if he were not also the Chairman of the BSL, it may be stated that the Committee in Chapter IV of the report has pointed out about only one defect in the contract which is in regard to non-provision of component-wise phased delivery schedule in the contract for the equipment supply. This has been explained fully in reply under Sl. No. 18—Paras 4.33 & 4.34. Though there have been certain delays in the supply of equipment, but other factors have supervened whereby the delay in the supply of drawings and equipment has not been a major contributory factor delaying the schedule of construction. While negotiating the contract, this aspect was duly considered by BSL as well as by the Government.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70, dated the 24th April, 1971.]

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*(referred in para 5.16) which was accepted by Government. The Committee do not agree with the explanations offered by the Chairman of BSL.

Comments of the Committee

Please see paras 14—16 of Chapter I of the Report.

Recommendations (Sl. No. 35)

The Committee are further amazed and distressed that in utter disregard of the accepted principles for the appointment of Chairman of public undertakings, and also in utter disregard of the interest of BSL itself, Government continued to have Sri N. N. Wanchoo as the Chairman of BSL while he was also the Secretary of the Ministry of Industrial Development. Even Sri Wanchoo told the Committee that he was dissatisfied with this arrangement of dual responsibility—Secretary of the Ministry of Industrial Development and the Chairman of BSL. He was frank enough to state before the Committee "in fact there is disadvantage of the Secretary continuing as Chairman. As regards adverse effects, my feeling is that I tried to do the best under adverse circumstances. Though I had lot of other work, I had tried to minimise the adverse effects with the combination of duties....In principle it would have been better to appoint a Chairman some body who had less burden than I have."

Sri Wanchoo thus admitted that one or the other duties assigned to him did suffer. This fact should largely explain the lack of proper supervision and coordination and delay in decision making in many vital matters which has resulted in delayed construction and loss of money.

(Para 5.24-5.25)

Reply of Government

When Sri N. N. Wanchoo, was Secretary of the Ministry of Industrial Development & Company Affairs, Department of Industrial Development, he had expressed a desire to be relieved of the post of Chairman of BSL. This Ministry had endeavoured to find a suitable substitute to replace him as Chairman of BSL. However, considering his past association with the project it was not considered advisable to relieve him of his appointment as Chairman of BSL, particularly when the project was in its crucial stage of construction. Shri M. Sondhi, who held the post of Managing Director w.e.f. 29-4-1969 and had acquired the necessary background and experience was in addition appointed as the Chairman of the Board of Directors w.e.f. 26-2-1970.

Under the delegation of powers made by the Board of Directors of BSL, the Chairman of the Board of Directors was designated as the chief executive of the company and delegated certain powers, besides the delegation of powers made to the Mg. Director for discharging the day to day functions and responsibilities. Consequent upon the transfer of Sri Wanchoo from the Ministry of Steel, the Board of Directors of the company in January, 1967 designated the then Mg. Director as the chief executive and delegated to him the powers which were concurrent to these vested in Chairman. The Mg. Director had thus the full authority and responsibilities for managing the affairs of the company including the authority to assume the full powers of the Board in any emergency between two meetings of the Directors. Thus, the continuance of Sri Wanchoo as the Chairman of the Board of Directors even after his transfer from the Ministry of Steel to the Ministry

of Industrial Development did not in fact in any manner hamper the work of Bokaro.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70, dated the 24th April, 1971.]

Comments of the Committee

Please see paras 14-16 of Chapter I of the Report.

Recommendation (Sl. No. 36)

Sri Wanchoo stated before the Committee that he submitted his resignation from the Chairman of BSL not once but several times and he pleaded to be relieved. The Committee are surprised that the Ministry could not find a suitable incumbent for this post as stated by the present Secretary of the Ministry of Steel & Heavy Engineering for the last five years. The least the Committee could say is that this does not speak well of our earnestness and efficiency if Government could not find a suitable incumbent for this post in five years time and Sri Wanchoo was relieved only when he retired from service.

(Para 5.26)

Reply of Government

Please see reply to para 5.24 (Sl. No. 35).

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70, dated the 24th April, 1971.]

Recommendation (Sl. No. 37)

The Committee do not agree with the plea advanced by the Secretary of the Ministry of Steel & Heavy Engineering when he says that on Mr. Wanchoo's transfer from the Ministry of Iron and Steel to the Ministry of Industrial Development, the spirit of the Estimates Committee's recommendations was fulfilled and the "basic principle had not been infringed because Sri Wanchoo is Secretary in another Ministry and had no part in advising the Ministry for Steel in judging the performance of Bokaro". The Secretary has missed the other important principle enunciated by the Estimates Committee wherein it is stated "it is not possible for such an official to give efficient attention to the affairs of the undertaking in addition to performing his normal duties." Sri Wanchoo has conceded this point of view from his own experience when he stated that the work under his charge did suffer. The Committee feel that if the Secretary of the Ministry of Steel felt that he could not relieve Sri Wanchoo from the Chairmanship of the BSL on account of his vast experience and knowledge and long standing association with BSL he ought to have persuaded Government to relieve him from the Secretaryship of the Ministry of Industrial Development in the interest of the proper execution of work at the project.

Reply of Government

Please see reply to para 5.24 (Sl. No. 35).

[Ministry of Steel and Heavy Engineering O.M. No. B-25(8)/70, dated the 24th April, 1971.]

Recommendation

The Committee find that in order to take advantage of the economic of the large scale production, the Government decided to have a steel plant at Bokaro with a capacity of four million tonnes. However, they decided to put up this capacity in two stages and stage one was of the capacity of 1.7 million tonnes. The Committee were very much perturbed to find that the benefits of the scale of production will not be available to the country even at four million tonnes production. From the comparison of cost of production as shown in para 6.5 of the report it will be seen that the cost of production per tonne in all categories of the final products at 4 million tonnes stage is higher than the cost of those items produced by Rourkela whose capacity is only 1.8 million tonnes. Thus, the Committee is unable to find what advantage accrues to the nation by installing a big capacity unit? The ultimate criteria in deciding the size of the unit could only be the cost of production per tonne. If these comparative prices given are correct then the Committee feel there is no justification in having a 4 million tonnes capacity plant in Bokaro. The Committee feel that the economies of scale at Bokaro should compensate even a slightly higher capital investment per tonne of installed capacity. The Committee, therefore, strongly recommend that a proper and a thorough techno-economic study should be immediately made with a view to remedy the situation so that the nation could have full advantage of the scale of production and get steel at cost comparable to Rourkela if not lower. This techno-economic study should be made by full qualified technical men and economists available in the country whether in Government and public sector or private sector or outside. The Government should also not feel shy to take the advice wherever it may be available whether inside the country or outside the country in order to improve the technology and economics of the Bokaro project.

(Para 6.12)

Reply of Government

The Government's decision to limit the initial capacity of the plant to 1.7 million tonnes stage was based on availability of resources. It has already been decided to expand the plant to the capacity of 4 million tonnes. The comparative costs of production of 4 million tonnes stage of Bokaro and Rourkela's 1.8 million tonnes stage furnished to the Committee were tentative. The CE&DB of HSL who have been appointed as principal consultants for Bokaro stage-II, have already undertaken the profitability analysis on the basis of the revised project estimates and the current costs of raw materials, services, labour, etc. However, it may be added that Rourkela steel plant was built some years ago and therefore, naturally the capital cost on a comparative basis was less in Rourkela. Since then apart from normal escalation in the case of Bokaro mainly due to greater dependence on indigenous supplies of equipment, the effect of devaluation, increase in import duty, etc., have considerably raised the costs. As far as product costs are concerned, these depend on a variety of factors, apart from the fixed costs, such as specification and cost of raw material, quality of steel manufactured, etc. For comparison, all these factors have to be considered on identical basis.

As has been stated earlier, the estimates of capital cost of the 4 million tonnes stage, and the profitability analysis are being worked out by the com-

pany's consultants, and a clear picture would emerge after the study is completed.

[Ministry of Steel & Hy. Engineering O.M. No. B-25(8)/70, dated the 24th April, 1971.]

Further information called for by the Committee

In their reply the Ministry stated that the estimates of capital cost of the 4 million tonnes stage and the profitability analysis were being worked out by the Company's consultants and a clear picture would emerge after the study is completed.

A final decision on the product-mix, etc. would be taken after a careful analysis of the economics of the project at the 4 million tonnes stage.

Has the C.E. & D.B. completed its study? If so, please furnish copies of the report and action taken by the Government thereon.

[L.S.S. O.M. No. 12-PU/70, dated 24-12-1971]

Reply of Government

Central Engineering & Design Bureau, the consultants, have not yet upto-date the cost estimates of the 4 million tonne stage and the profitability analysis also has not yet been worked out by them. It is expected that this exercise will be completed by June-July, 1972 when the same will be examined by the Government.

[Ministry of Steel and Mines, Department of Steel U.O. No. B-25(5)/70 dated the 14th January, 1972]

Commnets of the Committee

Please see paras 17-19 of Chapter I of the Report.

Recommendation (Sl. No. 48)

The Committee find that the agreement entered into with the foreign collaborators had vital omission like absence of any component-wise phased delivery schedule in accordance with the needs of the project. The result was that while on the one hand the supplies were deficient to the extent of 10,000 tonnes for the first blast furnace a large number of items of rolling mills required much later have already been supplied.

(Para 7.5)

Reply of Government

Reference may kindly be made to the reply to recommendation No. 18 which explains the circumstances in which a component-wise phased delivery schedule was not provided in the contract.

While it is true that all the supplies of equipment from the Soviet Union have not been received in the order and sequence required for the construction of the plant, the fact is that the supplies of equipment from the Soviet Union have, by and large, kept pace with the requirements of construction and have not adversely affected the progress to any significant extent.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70, dated the 24th April, 1971.]

Comments of the Committee

Please *see* paras 9-13 of Chapter I of the Report.

Recommendation (Sl. No. 49)

The Committee feel that had the two posts of Chairman of BSL and the Secretary of the Ministry of Iron and Steel not been combined in one person, the Ministry could have an opportunity of making an independent review of the whole negotiations and agreements between BSL and the Soviet collaborators.

(Para 7.6)

Reply of Government

As stated in reply to recommendation of the Committee at Sl. No. 34, the combination of two posts of Chairman of BSL and the Secretary of Ministry of Iron and Steel at the time when the negotiations were being conducted between BSL and the Soviet collaborators, it is considered, in fact, assisted in making effective and expeditious negotiations with the Soviet agencies.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70, dated the 24th April, 1971.]

Commnets of the Committee

Please see paras 5-8 of Chapter I of the Report.

Recommendation (Sl. No. 52)

The Committee very much regret to note that the Ministry has failed to set up an efficient administrative set up for BSL which could be equal to the task to construct and erect a steel plant of such a huge dimension within the stipulated time and within the estimated costs. As a result the target dates of completion have been revised twice and the costs have been increased by Rs. 90 crores.

The Secretary of the Ministry during the evidence before the Committee admitted that "there have been organisational failures on the part of BSL" which failure was also responsible for the delay in construction and losses. The Committee were told that in order to improve their management technique they were now introducing a system of net-work analysis which be done by Dasturco. The Committee were informed by Dasturco that the Bokaro project is in a mess from the very beginning because there is no proper consulting engineer on the project. It is the function of a consulting engineer apart from drawing up the correct project an economic project and a viable unit, also to do during the design and construction stages the complete co-ordination scheduling, supervision, follow up and expedition. All these items were a part of our work which we were supposed to be doing. It was taken out of our work and no body is doing it. The Committee failed to get a satisfactory answer as to why proper steps were not taken from the very inception to organise the management on such lines.

(Para 7.12—7.13)

Reply of Government

Realising the magnitude of the work, the Government constituted a separate corporation to own and erect the fourth steel plant at Bokaro. This separate company was incorporated in January, 1964 and has been exclusively incharge of this work. The company was headed for the first five years by the former Chief Engineer of CE&DB—another consulting organisation. The first Mg. Director had the experience of the first stage expansion of the three public sector steel plants at Rourkela, Bhilai and Durgapur and was considered eminently suitable to head this organisation. The present head of the organisation who combines the office of the Chairman and Mg. Director has rich and varied experience of industrial management and has a very good record of performance. This corporation has been managed by a broad based Board of Directors and has also been delegated wide powers on the lines of those delegated to HSL. The principal consultancy work is also in the hands of the Soviet agencies which had earlier engineered and collaborated in the establishment and successful expansion of the Bhilai steel plant.

The adverse observations of Dr. Dastur on the management of Bokaro Steel is understandable in the context of the appointment of the Soviet collaborators as principal consultants consequent upon acceptance of the Soviet offer of technical aid. It has already been explained to the Committee that timely action for introduction of a system of network analysis was taken by BSL and the work has been streamlined with the increase in the workload. Dasturco are not exclusively doing this work but are only rendering some assistance. Dasturco's comment that there is no proper consulting engineer on the project is incorrect since the Soviet consultants have very rich experience of designing and executing large steel plants.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70, dated the 24th April, 1971.]

Comments of the Committee

Please see paras 17-19 of Chapter I of the Report.

Recommendation (Sl. No. 56)

The Committee find that Government have already announced a decision to set up three more steel plants at Visakhapatnam, Hospet and Salem in the public sector. Comprehensive details about these proposed steel plants have not been made public. The Committee recommend that Government should without delay bring out a comprehensive White Paper containing essential information about the size of the plants, the capital investment involved, the product-mix and the rationale thereof, and in particular the economics and profitability of each of the plants. The Committee need hardly stress that the White Paper should be prepared most carefully so as to give precise and realistic estimates of vital factors which have a bearing on the working of the steel plants so that Parliament and public have clear idea of the resources which are being committed to these plants and the benefit which would accrue to the country therefrom. The Committee expect Government to take specific approval of Parliament to the setting up of these plants which are expected to play a crucial role in the development of economy of the country.

(Para 7.18)

Reply of Government

Government decision on the setting up of a special steel plant at Salem in Tamil Nadu, and an integrated steel plant each at Hospet in Mysore and at Visakhapatnam in Andhra Pradesh was announced by the Prime Minister in the Lok Sabha on April 17, 1970. Following this decision, a number of Committees were set up for the selection of the project sites and supply of raw materials to all the three projects. The raw material sources have thus been identified for each project. Government have accepted recommendations of the site selection committee in respect of all the three projects—Toranagalu for the Hospet project, Balachoruvu for the Visakhapatnam project and a site in the northern flanks of Kanjamali Hill for the Salem project. A steering committee under the chairmanship of Secretary, Steel and Heavy Engineering has also been constituted to keep a close watch over the progress of work in respect of the three new steel plants.

The preparation of the techno-economic feasibility reports for a 250,000 tonne special steel project at Salem and a 2 million tonne integrated steel plant at Visakhapatnam was entrusted to M/s. Dasturco on 27-2-1971. Their report for Salem is expected by the end of August, 1971 and that for Visakhapatnam plant by the end of November, 1971.

The preparation of the techno-economic feasibility report for 2 million tonne integrated steel plant at Hospet was entrusted to the CE&DB of HSL on 25-2-1971. Their report is expected by November, 1971.

[Ministry of Steel & Heavy Engineering O.M. No. B-25(8)/70, dated the 24th April, 1971.]

Further information called for by the Committee

Please intimate the action taken by Government on the following recommendation of the Committee :—

> "The Committee expect Government to take specific approval of Parliament to the setting up of these plants which are expected to play a crucial role in the development of the economy of the country."

[L.S.S. O.M. No. 12-PU/70, dated 15-9-1971]

Reply of Government

The Government are fully in agreement with the recommendations of the Committee that specific approval of Parliament should be obtained for setting up of the new steel plants. In the case of three new steel plants in the Southern region, such specific approval of Parliament was obtained through a token supplementary grant obtained in November, 1970. Expenditure of small magnitude on preliminary items in the nature of infra-structure such as land development, water and power connections, are being incurred during the current year and with Parliament's approval. The nature of the items on which such expenditure is being incurred has been explained in the notes on important projects and schemes circulated as supplement to the Demands for Grants for 1971-72. Fuller information in regard to capital cost, product-mix, financial and economic returns on the investments, etc., in respect of each of the plants would be furnished to Parliament in due course and substantial expenditure on the factory premises, equipment and

machinery, etc., would be incurred only with the specific approval of Parliament (*i.e.* when the Demands for Grants for the Department of Steel are discussed and voted).

[Ministry of Steel and Mines, Department of Steel, O.M. No. B-25(5)/70, dated the 24th December, 1971]

Further information called for by the Committee

(a) In their reply the Ministry stated that the techno-economic feasibility reports for the three new steel plants were expected by November, 1971. Have these reports been received ? If so, what are salient points in these reports ?

(b) What decision has been taken by Government on bringing out a white paper containing essential information in respect of these plants as suggested by the Committee.

[L.S.S. O.M. No. 12-PU/70, dated 24-12-1971]

Reply of Government

Regarding (a), the Techno-economic Feasibility Report on the Salem Steel Plant has been received recently. This is under examination. The Feasibility Reports on Visakhapatnam Steel Plant and the Vijayanagar Steel Plant are expected to be received only by the middle of February, 1972.

As regards (b), it is proposed to incorporate all the relevant details in respect of the three new steel plants in the Annual Report of the Ministry of Steel and Mines (Department of Steel) for the year 1971-72.

Government accept the suggestion for the preparation of a White Paper in respect of new projects to be taken up in the Fifth Plan period. This will be brought out at the appropriate time.

Comments of the Committee

Please see paras 20-25 of Chapter I of the Report.

CHAPTER V

RECOMMENDATIONS IN RESPECT OF WHICH FINAL REPLIES OF GOVERNMENT ARE STILL AWAITED

—NIL—

NEW DELHI;
Chaitra 28, 1894
April 17, 1972

M. B. RANA,
Chairman,
Committee on Public Undertakings.

6—4 LSS/72

APPENDIX I

(*Vide* reply to recommendation Serial No. 10)

Copy of d.o. letter No. 46/Adv(F)/BPE/68-22 dated 13-11-1968 from the Bureau of Public Enterprises to public enterprises.

My dear

The Committee on Public Undertakings in its 15th Report on Financial Management in Public Undertakings has made the following observations with regard to the approval by Parliament of the capital outlay proposed to be made during the financial year on the existing public sector undertakings as well as in respect of new ones proposed to be set up:

Recomm. 24.

"The Committee suggest that whenever demands for additional investment in public undertakings either by way of loan or equity are placed before Parliament, detailed uptodate information about the past investments in such undertakings, their achievements and working results should be given so that Parliament can exercise more effective scrutiny before approving the demands."

Recomm. 25.

"So far as new public undertakings are concerned, the Committee are of the view that prior approval of Parliament should be obtained before registering a Government Company as far as possible. Government should also lay before Parliament a document giving in detail the objectives of the proposed undertaking, its expected profitability, financial and other obligations."

2. The replies furnished to the Committee are reproduced below :—

"The setting up of a new public undertaking is treated as a "new service" which means that investment therein is made after obtaining Parliament's approval thereto either through the annual budget of the coming year or through a supplementary grant during the course of the year. In urgent cases, advances from the Contingency Fund are taken, but these are recouped by presenting supplementary demands to Parliament in accordance with the Contingency Fund rules.

While obtaining approval of Parliament through the annual budget or supplementary demands, detailed information as far as possible on the objectives, scope, capital cost, foreign participation, if any profitability and other financial obligations will be incorporated in the "Notes on Important Schemes" which are appended to the Volumes of Demands for Grants of the Ministries concerned, or in the explanations below the supplementary demands as the case may be.

In each volume the Demands for Grants of the Ministries concerned, a separate action will be added which will specifically

contain the list of all "New Service" and "New Instruments of Service" items included in the budget documents relating to public sector undertakings. This section will show the details of investment either by way of loan or equity in public undertakings indicating also the references where full details such as the objectives of the new undertaking, their capital cost, foreign participation, financial obligations, profitability, etc., are given in the budget documents. Similar information in respect of new service items will also be given in the introductory note to the "Supplementary Demands."

3. In order to give effect to the proposed procedure the following may be noted.

Existing undertakings.—Alongwith the budget proposal regarding additional investment either in the form of equity or loans in an existing undertaking, a brief write-up may be sent to the Budget Division of the Financial Ministry detailing uptodate information on the performance of the undertaking, which may *inter-alia* include :—

(i) The total capital cost of the project showing also the expenditure incurred up-to-date including the utilisation of internal resources for the purpose. Any likely increase in the capital cost may be also indicated.

(ii) The total investment in the undertaking by way of loan or equity, showing also the repayment of loans, if any.

(iii) The physical progress of the construction activities, erection of plant and machinery, township, etc., and the likely date of the completion of the project and commencement of production.

(iv) Information relating to expansions that may have been undertaken or are proposed to be undertaken in the immediate future.

(v) Production achievements in physical terms together with a comparison of the level of previous year's production, etc., and

(vi) Dividends, if any declared.

New or Proposed Undertakings

The setting up of new public undertakings is treated as a "new service" which means the investment therein is to be made only after obtaining Parliament's approval thereto either through the annual budget of the coming year or through a supplementary grant during the course of the year. (In urgent cases advances from the Contingency Fund are taken, but these are recouped by presenting supplementary demands to Parliament in accordance with the Contingency Fund Rules). While obtaining the approval of Parliament whether through the annual budget or through supplementary demands, it will be necessary to give detailed information in the "Notes on important schemes" which are approved to the volumes of the "Demands for Grants" of the Ministries concerned or in the explanations below the supplementary demands as the case may be. In order to incorporate full information in this regard in the budget documents, it is requested that along with the demands for investment either in the form of equity or loan in new public undertakings a brief write up may please be sent to the Budget

Division of the Finance Ministry, indicating the information on the following points :—

(a) Objectives of the proposed undertaking and its scope;

(b) Demand assessment and details of product-mix and its capacity;

(c) Location of the undertaking;

(d) Foreign collaboration, if any.

(e) Capital cost estimates, together with foreign exchange components;

(f) The likely dates of completion of project and commencement of production;

(g) Estimates of Profitability; and likely return on capital employed when the project achieves full rated capacity production; and

(h) Cost benefit analysis.

4. I shall be glad if you will kindly ensure that detailed information on the lines suggested above is invariably sent in future to the Budget Division of the Finance Ministry along with the demands for investment in public undertakings for incorporation in the Budget/Supplementary Demands documents.

Yours sincerely,

Sd/-

(P. GOVINDAN NAIR)

APPENDIX II

[*Vide* reply to recommendation Serial No. 7(i)]

Brief points arising out of discussions held on 18th June, 1966, among the representatives of the Bokaro Steel Ltd., Ministry of Iron & Steel and of Finance, Central Engineering & Design Bureau, Planning Commission & M/s Dastur & Co., on the cost reduction proposals of Bokaro Steel Project submitted by M/s Dastur and Co.

In the afternoon's discussions with Dr. Dastur and his representatives present, the cost reduction suggestions were examined. The main conclusions are briefly indicated below :—

(i) *Elimination of one Blast Furnace in Stage II along with reduction of one coke oven battery and one sintering machine.*—It was generally agreed that if foundry iron was needed by the economy, it would perhaps be more economical to produce it in an integrated complex than at a new site altogether. The Planning Commission's view was that the blast furnace and its facilities should not be eliminated. In any case this question did not need an immediate decision as this would arise only when the Stage II expansion of the Plant was finalised.

It was also noted that the elimination of the foundry iron furnace in Stage II would lesser the full economic utilisation of the investment incurred on pig casting machines and other facilities in Stage I.

(ii) *Steel Melting Shop.*—The major saving in this unit would arise from the elimination of one steel melting shop at the 4 million tonne stage. Dr. Dastur agreed that it might be necessary to set up a second shop in case production over 4 million tonnes was sought from the present complex. The second shop might be the nucleus of a second 4 million tonnes complex or may be of smaller capacity only to take care of any extra rolling capacity in the present complex. This question will require to be considered along with the inherent capacity of the rolling mills complex.

On the size of the converters, Dasturco representatives were confident that 250 tonne converters could work even with the present raw materials available in India. Bokaro Steel's comment on this is broadly sceptical. They feel that in view of the quality of Indian colomite it might not be possible to achieve the requisite minimum life of the lining which would make the use of these bigger converters economical. For this reason they felt that it would be better to have experience of how 100-120 tonnes converters would work before we went in for still larger sizes.

Besides this, the Soviets had already indicated that they were not in a position to supply the 250 tonne converters in stage I, as these were still being developed and tried out in the USSR. Dr. Dastur's suggestion was either to persuade the Soviet side

to supply these under their arrangement with M/s Voest of Austria, or for the Indian side to purchase this equipment separately from other suppliers. The third alternative was supply from M/s Triveni Structurals which was being set up in India with Voest's collaboration. These are all points, however, which the Soviets are unlikely to agree to.

(iii) Another item of saving was the *elimination of the waste heat boilers* in the Steel Melting Shop in Stage I. Bokaro Steel's view is that if these are eliminated, extra steam raising capacity will have to be provided.

As this point had been discussed with the Soviet Consultants in the Technical Committee's meetings, they thought it advisable to have the Soviet reactions to this proposal.

(iv) *Slabbing and hot strip mills.*—Dr. Dastur particularly clarified his conviction that the slabbing and hot strip mills suggested by him were capable of handling 5.5 million tonnes in terms of ingot steel, provided there were suitable modifications to the product-mix. Four million tonnes could be handled without any difficulty. According to him the calculations on the revised mills had been based on Soviet design standards and since they were retaining the same basic design, the mills would provide the extra yield of saleable steel which the Soviet Consultants had claimed. He accepted that the original design of the mills was excellent. But his view was that it had been over-designed.

Unfortunately, the detailed calculations made by M/s. Dasturco in this connection had not been furnished to M/s. Bokaro Steel. In the circumstances no detailed comments were possible. It was not possible to take any view on the correctness of Dasturco's claims, though Bokaro Steel in their comments were inclined to the opinion that this rolling mill complex could not handle more than 4 million tonnes on the accepted product mix. Any mill required to roll only the heavier, thicker and wider sections could achieve higher capacity but rated capacities for which Plants are designed are based on product-mixes which conformed to market expectations. On this basis, it was felt that the mill could not handle more than 4 million tonnes. As there is no means of either accepting or rejecting Dasturco's claims, the best course would be for them to place their detailed calculations before the Soviet consultants and consider their reactions.

(v) *Industrial Water-Supply.*—Dr. Dastur at the outset stated that all the base quantities and perameters were those assumed by the Soviets, and the only change they had made was in the manner of cooling. He said the cooling ponds system was suitable for small plants of ½ million to 1 million tonnes capacity, but bigger plants required towers with lower capital investment and economical working. He cited the example of Koyali where the Russians were persuaded to install cooling towers rather than cooling ponds. His estimate of the capital cost of the tower system was Rs. 269 million of which the towers themselves, with their civil works, would cost Rs. 28 million.

Unfortunately, the detailed design calculations and estimates of cost reduction both in capital costs and operational costs have not been made available, though Dasturco said these could be furnished. In these circumstances, it was again difficult to arrive at any conclusion regarding the technical suitability and the soundness of the savings claimed. It was pointed out to Dr. Dastur that the Soviets had estimated the capital cost of cooling towers as Rs. 299 million, as against Rs. 316 million for cooling ponds system, though the cooling ponds system would be about Rs. 9 million cheaper in operation every year. A copy of the note embodying these figures was handed over to Dasturco representatives. If the Soviet figures were correct, the extra capital cost on the cooling ponds system would be neutralised in 1½ years to 2 years. Dr. Dastur felt that the Soviet had based their calculations on their own experience of cooling towers which were not as modern and efficient as available in the country. In the absence of any detailed information Bokaro Steel's comments on these points again are general. They are more inclined to accept the figures of the Soviet Consultants, who were provided all detailed information by Bokaro Steel on the latest cooling towers in India along with the design assignment.

Since the difference in capital costs would now appear to be of the order of Rs. 47 million, and there was no clear indication of the comparative operational costs, it was felt that this matter might also be put to the Soviet Consultants.

(vi) *Power Generation and Distribution.*—Dasturco's suggestions are to instal three generator units of 30 MW each in place of the two units of 55 and one unit of 12 MW suggested by the Soviets. The Planning Commission view on this was that the Indian generator manufacturing capacity was being standardised for the production of 55 and 12 MW generators and not for 30 MW. Unless there were major technical or financial implications, there would be an advantage, therefore, in retaining the generator capacities indicated by the Soviet Consultants. Dr. Dastur agreed that this in any case did not mean any major savings and need not be pressed.

The power distribution system proposed by Dasturco could not be scrutinised in the absence of detailed data. It was thought that it would be put to the Soviet Consultants but need not be pressed in case they had any doubts.

(vii) *Repair and Maintenance Shop.*—Dr. Dastur's view was that the Soviet themselves were changing over to the practice of providing less maintenance and repair facilities than they had in the past. On the other hand the comments of Bokaro Steel are to the effect that the Soviets are adopting more and more repair and maintenance facilities at the plant, instead of relying on manufacturing capacity outside. In view of this difference of opinion, the matter could best be left to the Soviet Consultants.

(viii) *Plant location.*—Dr. Dastur stated that although there was a difference of 70 to 100 feet in height between the highest and

the lowest points in the area selected, they had taken great care in designing their lay-out to see that the difference in height between the first and second complexes was such as would allow for permissible gradients. He had planned the first rolling mill complex at a level of 226 m, leaving the higher mounds more or less intact. As against this the Soviets were planning at a level of 229 m. He claimed that the extra earth removed from this area could be utilised for filling up the lower parts, so that the next complex would not be at a level very much lower than the first. In view of this the site levelling for the second complex would not cost more than Rs. 5 crores.

Bokaro Steel are not inclined to accept the view that site levelling would cost only so little.

9. Dr. Dastur said that they had all their calculations and work sheets on all their suggestions ready and were in a position to place them before the Soviet Consultants in Moscow.

APPENDIX III

[*Vide* reply to recommendation Serial No. 7(i)]

Extracts from the Report on the Discussions held between the Steel Ministry Delegation, led by Shri N. N. Wanchoo, Secretary to the Government of India, Ministry of Iron & Steel, and the Soviet Experts at Moscow from 25th June to 6th July, 1966 *on Cost Reduction Proposals relating to Bokaro Steel Plant.*

The Cost Reduction Study Report was submitted by Messrs. M. N. Dastur & Co. on the 21st May 1966. As final decision on changes had to be made by the 20th June, 1966 to avoid liability for cancellation charges, etc., this Report was immediately sent to the Soviet Consultants on 24th May 1966 to give them sufficient time for study. They were also informed that the Indian Delegation was expected to be in Moscow towards the middle of June, when these proposals could be discussed in detail and any points of doubt clarified. Meanwhile the proposals were also examined by the experts of the Bokaro Steel Ltd. who took up the examination of the matter in consultation with Dasturco. They were greatly handicapped in making a proper assessment of Dasturco's cost reduction proposals, as the proposals as set out on the report, lacked detailed technical design basis, detailed cost calculations and break-up of cost savings. This was necessary to analyse the technical acceptability of the suggestions and also to judge as to what extent the savings estimated by Dasturco were realistic. Despite their best efforts, Bokaro Steel Ltd. experts failed to secure this information during the course of two week's discussions they had with Dasturco in Calcutta. BSL's comments on the Cost Reduction Study Report were submitted on June 16, 1966 and the Ministry of Iron & Steel decided to have further discussions with Dasturco at Delhi, so that suitable instructions to the Delegation could be given on the various points covered by the Cost Reduction Study. (Representatives of the Planning Commission and the Ministry of Finance were also invited to these discussions). Even during the discussions Dasturco did not come up with any detailed design basis or detailed cost calculations which could be checked by us, although they assured us that they had all the calculations and worksheets with them in Calcutta and were prepared to put them before the Soviet side in the discussions at Moscow. In view of the fact that the time at our disposal was very little there was other alternative but to go by the Indian Consultant's statements on the subject, although this severely handicapped the official members of the Delegation in forming a truer estimate of the likely savings by full adoption of Dasturco's proposals. A copy of the instructions issued to the Delegation is attached as Annexure I.

1.2. The Indian Delegation proceeded to Moscow on the morning of 24th June 1966 and returned on the 7th July, 1966, after frank and detailed discussions with the Soviet technical experts on all points in the course of which Dasturco's representatives had a full and free opportunity to express their point of view. During the course of discussion, Dasturco produced at Moscow working papers and supporting data with regard to the under-mentioned items :

(i) Hot Rolling Mills

(ii) Power Plant

(iii) Power Distribution

(iv) Water Supply System.

These were considered by the Soviet experts and each point was discussed in detail. We record below a summary, item by item, of the discussions. The proposals are now under the consideration of the Soviet Government and their final views may be expected shortly.

Conclusions

23.1. The picture as it emerged after the discussions with the Soviet experts of Gipromez shows a total reduction in Bokaro estimates of about Rs. 12 to 13 crores (with the omission of the by-products plant) as against Dasturco's proposals of roughly Rs. 100 crores in the first stage. (It should be noted that during discussions in one or two cases Dasturco themselves accepted that some of their savings estimated were over-estimates; some savings were, of course, not genuine "cost reductions" as they were based on adoption of lower rates for certain types of work. If these qualifications are noted, the true savings even on full adoption of Dasturco's proposals would be much lower than Rs. 100 crores claimed by them.) The above estimated also includes an additional expenditure of Rs. 3 million which will have to be incurred on account of the modifications in design required for coal preparation plant for providing handling of three streams of coal separately.

23.2. Besides the discussions with the technical experts, the Leader of the Delegation, Shri Wanchoo, had three on the 25th June and 4th and 6th of July with Mr. V. Sergeev, Deputy Chairman of the State Committee of the USSR Council of Ministers for Economic Relations. On the first day, the Indian Charge—d' Affaires Shri Jaipal, was present whilst on subsequent days Shri Wanchoo was accompanied by Shri Mathur and Shri George.

23.3. Shri Wanchoo made it clear to Mr. Sergeev that the Government of India attached very great importance to the cost reduction proposals and that the outcome of the detailed discussions with the Soviet experts was not very satisfactory from our point of view. The Soviet experts had agreed to only some minor points but had not agreed to any of the major proposals (the rolling mills, the steel melting shop and the industrial water supply system) which, if accepted, would reduce the cost considerably. In these discussions Mr. Pescariev, the acting Head of the Gipromez organisation was present. Mr. Sergeev, while accepting that economy in the total cost was the objective of both the sides, clearly indicated that in this technical matter his Government would have to go by the opinion of their technical experts. He repeatedly mentioned that they had great confidence in their technical organisation and according to their estimates the reduction so far amounted to only Rs. 70 to 80 million which along with another Rs. 50 million for modifications in the by-products plant would result in savings to the extent of Rs. 120 to 130 million. He, however, assured us that his Government would look into the matter in greater detail and would communicate the final views of the Soviet Government in the course of the next few days.

APPENDIX IV

(*Vide* reply to recommendation Serial No. 3)

Interim Report of the Special Secretary, Ministry of Finance, Department of Expenditure

In their letter No. Secy/I&S/66-89, dated the 25th February, 1966 a small committee under the chairmanship of Shri K. L. Ghei, Special Secretary, Ministry of Finance with Shri Ajit Mozoomdar, Joint Secretary, Department of Co-ordination, Ministry of Finance, and Shri K. M. George, Managing Director, Bokaro Steel Limited, was appointed to undertake an examination in regard to the estimates as given in the Bokaro Project Report prepared by the Russians and as subsequently modified by the Technical Committee appointed by the Government, *vis-a-vis* the expenditure at the Rourkela Steel Plant and the information available of the previous estimates made for the Bokaro Steel Plant. Shri V. Ramachandran, Deputy Secretary, Ministry of Finance, was co-opted and Shri H. S. Gill, Deputy Secretary, Ministry of Iron & Steel, provided the secretarial assistance. For this examination, the resolution passed by the Board of Directors of Bokaro Steel Limited as well as the analysis and comparison made by them were also to be taken into consideration. The Committee was entrusted with the task of this examination to see whether the estimates have been realistically prepared and whether in the light of some alternative technical proposals a reduction in the estimated cost of the project could not be secured without impairing any of its essential objectives. The Committee were also asked to prepare, if practicable, a profitability estimate on the basis of data available. It was left open to the Committee to seek technical assistance from other persons and organisations, such as the Central Engineering & Design Bureau of Hindustan Steel Limited and M/s. M. N. Dastur & Company.

2. The Committee started functioning from the 26th February, 1966 and have been in session every day since then. The Committee have considered the various estimates prepared by US Team, Dasturco with the estimates prepared by the Russians at the 4 million tonne stage as given in the Resolution No. 198 of the 14th Meeting of the Board of Directors of Bokaro Steel Limited considering the layout, major equipment cost, utilities, such as water supply, railway facilities, power supply, etc. with a view to locate the areas where cost reduction may be possible. The Committee also took into account the discussions which Secretary, Iron & Steel, had with the Soviet technicians on two questions, *viz.* (i) the possibility of further expansion in Bokaro; and (ii) the reasons for having cooling ponds instead of cooling towers. A verbatim record of these is appended as annexure I.

The Committee also discussed the necessity of obtaining the views of Dasturco as also the Central Engineering & Design Bureau who were associated with the work of the Technical Committee throughout and were fully familiar with the problem for suggesting such areas in which any further reduction was possible. Secretary, Iron & Steel, accordingly addressed these two organisations and their replies dated the 4th March and 5th March, 1966, respectively, are at annexures II and III. After going through the various estimates, the Committee felt the desirability of obtaining clarifications listed in the annexure IV, from the Soviet side and accordingly dis-

cussions were fixed with Mr. Goubert and his team on the 4th March, 1966 at 3.00 P.M. The verbatim record of these discussions is at annexure V.

3. Consultations by this Committee with the available Design Organisations set out in annexures II, III & V may be briefly summarised as follows :—

(a) The Russians have reaffirmed that there is a little to modify in their Project Report. In fact, Mr. Goubert claimed that on the basis of the costs of their Project Report, the project was no more expensive than as had been designed by Dasturco or by U.S. Steel, and in support he gave the following investment costs per tonne at the Million Tonne Stage :

(In rupees)

	USSR.	Dasturco	U. S. Steel
Ingot steel	1260	1130	1290
Finished Steel	1570	1550	1780

(b) The letter from Shri R. P. Sinha, Chief Engineer, Central Engineering & Design Bureau, to Secretary, Iron & Steel, indicated that some cost reduction may be possible by reduction in the overall time-schedule of the project, as this will automatically decrease the cost in such areas as price escalation, management, engineering cost and capitalised interest. From overall investment point of view, he expressed the opinion that cost given in the USSR Project Report, as modified by the Technical Committee, is not unreasonable.

(c) M/s. Dastur & Company, in their letter to Secretary, Ministry of Iron & Steel, hinted on possible economies concentrated solely on the Indian costs. They suggested that specific suggestions for cost reduction will require intensive study for some length of time and for that specific assignment, two or three months' time was requested.

4. The Committee also felt that it would be useful to have discussions with Shri Braganza, Managing Director, of Hindustan Steelworks Construction Ltd. in regard to the cost of civil engineering works, structurals, etc., and, if possible, with Shri Purtej Singh, General Superintendent, Bhilai Steel Plant, who is a specialist in regard to water supply. The latter, on account of his illness, could not participate in discussions.

5. The detailed unit-wise break-up of the cost of Bokaro Steel Plant at the first stage is given in annexure VI.

6. The Committee considered the following comparisons which were compiled with the assistance of the engineers of the Bokaro Steel Ltd. and from the Central Engineering & Design Bureau of Hindustan Steel Ltd. :—

(i) Comparison of cost between Bokaro first stage 1.7 million tonnes and Rourkela 1.8 million tonnes in respect of the main units such as coke oven and by-product plant, blast furnace, steel melting shop and hot and cold rolling mills (annexure VII);

(ii) Comparison of cost between USSR and Dasturco estimates, 4 million tonne stage, in respect of the main units mentioned in (i) above. (annexure VIII). Similar detailed comparison with the cost estimates of U.S. Steel could not be made as detailed unit-wise break-up was not available with the Ministry of Iron and Steel;

(iii) A detailed analysis of rates has also been made, giving comparison of rates as adopted in Bokaro estimates with those for Bhilai expansion and Rourkela expansion and the rates given in the Dasturco Report (annexure IX). These have been examined in detail with the Managing Directors of Hindustan Steelworks Construction Ltd. and Bokaro Steel Ltd.

7. *Plant & Equipment*

On the capital cost of the plant and equipment (nearly Rs. 2,810 million on c.i.f. basis) as such the average cost per tonne for the plant and equipment at the 1.7 million tonne stage on a c.i.f. basis will be Rs. 6,463 as against Rs. 6,176 per tonne in the second stage. At the first stage (*viz.* 1.7 million tonne stage) there would have been created a reserve capacity specially in steel rolling mills which is a relatively sophisticated item (individually the rate per tonne for steel melting mills, plant and equipment will be far higher than the average rate). The capacity created would carry it upto the second stage (4 million tonne) and on the data given in the Project Report the cost per tonne of equipment at the 4 million tonne stage will be Rs. 6,176. This average price is as if the entire plant and equipment would be from USSR. The reasonableness or otherwise in this figure could be judged by comparing it with the price paid for the Russian plant and equipment in respect of their Bhilai 1st stage of Expansion. The average c.i.f. price for tonne negotiated with the Russians in February, 1962 was Rs. 5,950. Compared to this the average price of Rs. 6,463 per tonne means an increase of 10%. Taking the 4 million tonne stage when practically all the rolling facilities and other reserve capacities will be fully utilised, the rate per tonne works to Rs. 6,176 *i.e.* an increase of about Rs. 226 per tonne over the average of 1962 price. It is but to be expected that the figures adopted in the project estimate normally take into account negotiating margins and some reduction in this item may be expected.

8.1. The differences between the USSR and Dasturco estimates in the department-wise comparison set out in Annexure VIII, are almost all attributable to the lower costs estimated by Dasturco for major plant structures, foundations and erection costs of equipment. Some differences are highlighted in the following Table :—

Quantities (4 million tonne stage)

Item	Unit	USSR	Dasturco
Structural steel	Tonnes	307,000	213,000
Concrete	Million Cu. m.c.	2.13	1.52
Refractories	Tonnes	346,000	217,000
Earth work	Million Cu. m. c.	39	27

Applying the average rates for these types of works, as discussed earlier, a difference of around 400 million between the estimates can be attributed to the differences in quantities.

Mr. Goubert maintained before the Committee that the USSR estimates were based on very detailed calculations; he observed in particular that the estimated cost of construction and erection of converter shops as given in the Dasturco Report was very much understated. The Committee is in no

position to assess whether the quantities given in USSR Report can be reduced.

8.2. *Main equipment*

At annexure VII the Committee has tried to compare the erected cost of main plant and equipment department-wise at Rourkela upto 1.8 million tonne stage with the estimates prepared by the Technical Committee on the basis of the USSR Project Report for the 1.7 million tonne stage of Bokaro. The investments are given first in absolute terms and then reduced to per tonne of the product of the particular department. These are based on weighted averages; therefore the cost of more expensive equipment such as rolling mills tends to be understated whereas the cheaper equipment like coke ovens, blast furnaces and steel melting shops is overstated. A further comparison is made between the investment per tonne at Rourkela (1.8 million tonnes) with the investment per tonne at the 4 million tonne stage of Bokaro, again as estimated by the Technical Committee, the figures for Rourkela are estimates of actual costs as incurred and have not been adjusted for price escalations. The results of the comparison are considered in the succeeding paragraphs.

8.3. *Coke Ovens and by-product plant*

The coke ovens are of larger size and have greater output than those at Rourkela and hence the investment per tonne will actually be lower at Bokaro (if price escalation is taken into account), although in absolute terms the investment will be Rs. 115 million higher. The difference in total cost is attributable to the additional coking capacity required for the extra blast furnace and the inbuilt coke and coal handling facilities.

The Technical Committee had been advised by the Directorate General of Technical Development that the full range of by-product recovery from coke oven gases should be aimed at. It has been brought to the Committee's notice by Shri Mojumdar that there is likelihood of errors in the demand and supply position. This aspect is being pursued by the Committee.

The Committee will also examine whether reliance for sulphuric acid can be placed on the sanctioned plant of PCDC.

8.4. *Blast Furnace*

The estimated cost for Bokaro at the 1.7 million stage will be Rs. 379 million higher than at Rourkela. The higher absolute cost is largely attributable to the extra capacity for foundry iron. On the basis of capital cost per tonne, the first stage estimate for Bokaro is Rs. 214 per tonne against Rourkela's Rs. 130. If at the 4 million stage, the additional furnace for foundry iron is omitted, the capital cost per tonne of hot metal will be Rs. 134. Allowing for the escalation of prices, the investment of blast furnaces will reflect the economy effected by the choice of 2000 cu. m. furnaces as against lower capacity furnaces at Rourkela.

8.5. *Sintering Lines*

The investment in sintering plants at Bokaro is estimated at Rs. 243 million as against Rs. 54 million only at Rourkela. This, of course, is explained by the much higher sintering capacity project at Bokaro. It had

been suggested by Messrs. Tyzpromexport that the second sintering line could be postponed to stage II to reduce the capital cost at stage I and bring the foreign exchange requirement within the credit limit. Mr. Goubert, Director, Gipromez, did not agree to this and the Technical Committee also rejected this suggestion on grounds given at page 56 of that Committee's Report. Shri Mozoomdar is of the view that the capital cost of the project at stage I is so high that every substantial economy that is technically feasible should be resorted to. He would, therefore, like the establishment of the second sintering line to be deferred, despite the operational problems mentioned by the Technical Committee. Shri George is of the view that it is essential to have the second sintering line in stage I.

8.6. *Steel Melting Shop*

The total capital cost of the steel melting shop and auxiliaries for Bokaro stage I is estimated at Rs. 483 million as against Rs. 223 million at Rourkela despite the fact that part of the steel at Rourkela is made in O.H. furnaces involving higher capital outlay. Per tonne of ingot steel, the investment at Bokaro in stage I is Rs. 284 as against Rs. 124 at Rourkela. At the 4 million tonne stage, the Bokaro cost will come down to Rs. 211 per tonne. A part of the explanation for the higher cost per tonne at stage I is the fact that the first converter shop is designed to house 5 converters, whereas only 4 will be installed. If the fifth were to be installed, for raising the steel capacity to 2.5 million ingot tonnes. some reduction per tonne would no doubt be achieved. The Bokaro Report envisages certain additional facilities such as, waste heat boilers, mould preparation facilities and slag yard. The Committee re-opened with Mr. Goubert the possibility of having 250 tonne converters from the first stage. The theoretical advantage of using uniformly 250 tonne converters would be that only one single converter shop would be required. This might, however, have adverse operational implications. The Committee also enquired from Mr. Goubert whether converters of intermediate size, such as, 130/170/200 tonne could be considered, resulting in reduction in capital cost per tonne of output. Mr. Goubert replied that while there might be a theoretical cost advantage, the Soviet Union would not like to supply other than 100 tonne converters, to Bokaro at stage I, as the performance of large converters had yet to be proved in USSR. In view of Mr. Goubert's categorical statement, the Committee does not consider that pursuing this matter further would be worthwhile.

8.7. *Hot and cold-rolling mills*

Taking the slabbing mill, the hot strip mill, the cold rolling mill and associated plants together, the capital cost at Stage I of Bokaro will be Rs. 1,360 million as against Rs. 1,123 million for Rourkela 1.8 million tonnes. The incidence of the higher capital cost per tonne of finished product is, however, considerably reduced by the fact that the Bokaro Report envisages a significantly higher output of rolled products. The comparison tends to under-state the cost advantage at Rourkela at this stage, because Rourkela has additional timming facilities. On the other hand, when the primary rolling mills are engaged in the production of 4 million tonnes a year or in the ultimate stage of 5.5 million tonnes, then it is expected that the capital cost per tonne will be very much less at Bokaro, as the additions required would only be some soaking pits reheating furnaces, and additional processing and finishing facilities in the cold Rolling Mill.

In absolute terms, the difference in capital cost of Rs. 237 million between Bokaro and Rourkela estimates, after allowing for price escalations

would represent the large in-built spare capacity at the 1.7 million stage. This, however, by no means represents the full cost impact of the spare capacity in the rolling mills. Since the optimum output of the continuous hot strip mill is equivalent to a throughput of 5.5 million ingot tonnes, the entire plant has been laid out for a capacity of 5.5 million tonnes. This influences the area of site development, the power distribution facilities, the water and gas mains, raw material storage, transport arrangements, whether by conveyor or by rail, and so on. The result will be that even at the 4 million tonne stage all the utilities and a considerable part of the main production facilities will be incompletely utilised. If a somewhat smaller size hot strip mill had been selected, of width, say 1700 mm instead of 2000 mm, the optimum capacity of such a mill might have been 2.5 to 3 million tonnes, and the inbuilt additional capacity at Stage I would have been very much lower, a saving which would have been reflected in lower costs. The Committee noted that the decision to incorporate hot rolling facility for widths upto 200 mm. was included in the Design Assignment, and had, in fact, been recommended both by U.S. and Dasturco. The demand for 2000 mm. sheets is at present extremely small, and it could be agreed that it is probably premature to instal this facility in India just now. The Committee put to Mr. Goubert the question what would be the savings if the 2000 mm. mill were to be replaced by a somewhat smaller width mill. Mr. Goubert did not reply to this question directly, but indicated that a change in the specifications of this mill would necessitate the complete recasting of the Project Report, with recalculations of all quantities, effecting the sizes of almost all other plants. He said that a change in design at this stage of such magnitude would result in the whole project being delayed by one year. The Committee considers that it is not practicable at this stage of the project to seek economies by way of a change in the mill size and a reduction in the total capacity of the primary rolling mills.

The Committee noted that the USSR design of the continuous hot strip mill involves main drives which have a much higher powering than was assumed in the Dasturco Report.

It has been mentioned earlier that the efficiency claimed for the rolling mills offered by the USSR is significantly higher than anticipated in the U.S. Steel and Dasturco Reports. It will be necessary to obtain adequate performance guarantees on this point, so that the economy claimed in the mills' operation is actually achieved.

9. *Indigenous Plant and Equipment*

According to the distribution list agreed to with the Russians, 60% of plant and equipment will be procured indigenously, mainly from Heavy Engineering Corporation, Bharat Electricals Ltd., etc. The cost estimate includes preference over the c.i.f. value of 45% (being equivalent to current average duty) and amounts in absolute terms to Rs. 759 millions. The increase in customs duty is purely fortuitous; the average element of customs duty was only 18% about a year back and it is reported that Heavy Engineering Corporation and other undertakings were then prepared to accept orders on a price formula of c.i.f. *plus* 18% customs duty. Adopting the higher rate would mean passing on to indigenous producers an unintended benefit; quite apart from unnecessarily over-capitalising Bokaro. In our view such prices should be held at a ceiling of c.i.f. value plus 25% as price preference including sales tax. The reduction of the protective element from 45 to 25% would mean a saving of Rs. 338 million in the total estimate.

The Committee also note that after submitting their estimates the Bokaro Project had further revised the proportion of the indigenous to imported in respect of structurals, refractories and some miscellaneous items. The proportion of 60% indigenous and 40% imported basis which was adopted originally was changed to 84% and 16% for structurals and 93% and 7% for refractories. This change in percentage results in a reduction in the overall estimates. In respect of structurals and refractories the price for indigenous portion is not taken at the c.i.f. price plus customs but has been taken at the current ruling market rates which are lower than the imported price. The reduction on this account is estimated at about Rs. 65 millions.

10. The value of construction and erection cost at the first stage is estimated to be about Rs. 1,745 million. So far as rates for major construction items are concened, we have attempted a detailed comparison with the rates currently operating in Rourkela and Bhilai. (See annexure IX). Opportunity has also been taken of examining the analysis of rates worked out by the Hindustan Steelworks Construction. The position is briefly summarised below :—

(i) In regard to structurals the rate adopted in the estimate is Rs. 2,086 per tonne of structural erected (including painting). This rate was discussed with Shri Braganza, Managing Director, Hindustan Steelworks Construction Ltd. Shri Braganza had with him the recent quotation obtained for structurals against open tender in connection with the Godavari Bridge work. The rates vary from about Rs. 1,600 per tonne to Rs. 2,167 per tonne. The erection charges vary from Rs. 450 to Rs. 512 per tonne. Shri Branganza explained that according to his own calculations an average rate of Rs. 2,174 per tonne would represent the current cost of structural work including erection. He, however, hopes that about 40 to 50% of the structural work can be distributed to small and medium structural fabricators at a rate about 25% lower than the rates that are being offered by larger fabricators, and so the rate suggested was Rs. 2,086 per tonne. The total tonnage of structurals that would have to be got fabricated and erected indigenously in the 1st stage (in a period of about 3 years) will be about 180,000 tonnes and large fabricators could not be eliminated altogether.

Over the period of 4 to 5 years, *i.e.* by the time 1st stage work is completed, enough capacity in the medium and small fabricators would develop to secure, as compared to the present level of prices, a reduction af about Rs. 200 per tonne. This for the balance of nearly one lakh tonnes might give a reduction of the order of Rs. 20 million. Shri Braganza, however, stressed that considerable savings might be possible through proper co-ordination in the distribution of work for fabrication and procurement of matching steel it would be of great advantage if the design and drawing responsibility for structurals is entrusted to one organisation *viz.* Hindustan Steelworks Construction Ltd.

(ii) In regard to Cement Concrete and Masonary work which forms the other large volume of work in the construction activities, the rates adopted for the various items of work have been discussed in detail with Shri Branganza and his engineers of the Hindustan Steelworks Construction Ltd. have independently analysed the rates for various major items on the basis of current costs of cement, steel, bricks and labour. These rates have been compared and checked with the rates that have been currently operating at Rourkela and Bhilai. The rates adopted by the Bokaro Project for purposes of estimate are generally lower than the present rates at Rourkela and

Bhilai for similar works and compare with the rates worked out on an analysis basis and the rates determined on the basis of independent analysis by Hindustan Steelworks Construction Ltd. This is based on the expectation that Hindustan Steelworks Construction Ltd. as a main agency carrying out the work would be able to secure favourable rates. Shri Braganza explained that he had kept a margin of 10% profit, though he was hopeful of securing economies considering the period of 4 to 5 years over which the construction would be spread. He could not accept a reduction at this stage.

11. This interim report deals with main plant and equipment as erected. With respect to the remaining items in the Project Report, *viz.* power and water supplies, sewerage, gas supplies and other utilities, maintenance workshops, construction equipment, provision for administrative expenses, etc., the comparisons undertaken by the Committee between the Bokaro Detail Project Report and Rourkela actuals and other estimates are still not complete. The Committee's observations on these latter estimates will be made in its final report.

The Committee have not examined estimates of off-site facilities, the total cost of which amounts to Rs. 582 million. This examination is proceeding.

Sd. K. L. Ghei,
15-3-66.

Sd. Ajit Mozoomdar,
15-3-66.

Sd. K. M. George,
15-3-66.

Sd. H. S. Gill,
15-3-66.

ANNEXURE I

Record of the discussions held in Room No. 193, *Udhyog Bhavan, New Delhi, on Monday, February* 28, 1966, *at* 10.15 *a.m.*

PRESENT

Mr. N. N. Wanchoo	Mr. Goubert
Mr. K. S. Bhandari	Mr. Kalashnikov
Mr. K. M. George	Mr. Gregoriev
Mr. H. K. Maitra	Mr. Gribanov
	Mr. Kuznetsov

Mr. Wanchoo

I would like to take advantage of Mr. Goubert's presence here this morning and clarify one or two points which is worrying us. We will spread out the layout drawing. I want to ask some questions.

The first point is : This plant is designed for 4 million tonnes rising to 5.5 million tonnes. There are certain spaces left here, there and there (north, south and northwest of proposed layout) for further expansion beyond 5.5 million tonnes. First of all, could you give me some idea as to what would be the maximum possible expansion later? How do you visualise that the expansion is likely to be done?

Mr. Goubert

The facilities provided within the fence of the steel plant is for the 4 million tonne capacity. This is incorporated in the Detailed Project Report. We have also, as we call, technically inevitable reserves and margins in the rolling mill equipment. These margins of capacity of the rolling mills can provide for 5.5 million tonnes of ingots. But to use the rolling mills to the full capacity, we have to provide for the corresponding tonnage of steel and pig iron. We have provided space for setting up additional converters in steel melting shops No. 1 and No. 2.

Mr. Wanchoo

Within the plant itself?

Mr. Goubert

Yes, within the plant itself as shown here (layout drawing). We have provided for the expansion of the blast furnaces and coke ovens in this direction (northwest). This is for 5.5 million tonnes.

Now, let us suppose that you have the intention to develop the plant to a higher capacity, above 5.5 million tonnes. For this purpose, we have provided these areas (north and south). For the expansion above 5.5 million tonnes, you have to set up a new complex of steel melting shop and rolling

mill facilities here (north), and the same on the opposite side (south). The pig iron complex and coke oven complex will have to be extended this side (northwest). Suppose we are going to utilise this area (north). We have to set up additional blast furnaces. The hot metal from the blast furnaces will be delivered this way. You have to construct bridges spanning the canals so that delivery of hot metal will be possible. If you want to utilise the other side (south), you have to carry hot metal this way and the railway tracks for disposal of finished product will be relaid on the other side, further south.

Mr. Wanchoo

How do you take the hot metal from here to there (south) ?

Mr. Goubert

We have to close the existing railway tracks, close them at this point, and hot metal will be delivered straight. These tracks are intended for disposal of finished products. And in future we can relay the tracks for the finished products.

Mr. Wanchoo

Relaying of these tracks will be necessary ?

Mr. Goubert

These tracks will remain for servicing. for repair and maintenance facilities. But we will have a dead end and you have to have fresh tracks for finished products.

Summing up, I can say that we are in a position to develop the steel plant on both sides.

Mr. Wanchoo

Upto what capacity, roughly ?

Mr. Goubert

We have analysed this point in Moscow. We did not know you would ask this question. But on the general layout, we have analysed this point. In Moscow, we have also the drawings, diagrams of these tracks, of this further expansion. Our estimate is that on this side (north) we are in a position to set up a new complex of 5-6 million tonnes. The new facilities will comprise melting shops and rolling mills. The same complexes may be set up on the other side (south). On this side (northwest) we can develop the coke ovens and blast furnaces so as to suit the development on both sides (north and south). There is enough space.

Mr. Wanchoo

For 15 million tonnes ?

Mr. Goubert

Yes, for 15 million tonnes. We have the possibility to expand upto 15 million tonnes, or even more. We did not go into details on this because

first of all we did not get this assignment. And you are not in a position to let us have this today because you do not know the trends, the future demands. You can develop the steel plant for production of merchant steel or pipes or tubes, but do not know today. But we are in a position to say that the Detailed Project Report provides for possibilities of future expansion upto the figure indicated. I can tell you one thing more. This question has been discussed in the USSR at higher level by our technical authorities in detail. I would like you to know my comments as to the optimum size of the steel plant.

Mr. George

Should we get Mr. Ghei here now ?

Mr. Wanchoo

No, it is not necessary. We can give him a verbatim report of the discussions.

Mr. Goubert

As you know, we have in the USSR steel plants producing from 100,000 up to 10 million tonnes per year. And we have experience of operating both small and very large plants. Of course you know about our Magnetogorsk works steel complex which is designed for an output of 12 million tonnes. I have myself dealt with the problems of further development of this works. I have prepared a special report on these points for our Government. Briefly, our conclusion was that a plant having capacity of over 10-12 million tonnes is to some extent ungovernable. Our final conclusion was that it is not advisable to set up steel plants with a capacity of over 10 million tonnes. And obviously in the Soviet Union, we have no intention to go in for more such plants of this size. From the point of view of economics as well as from the point of view of operation, the optimum size of a steel plant is, in our opinion, 5-6 million tonnes. But in this particular case, for the Bokaro Steel Plant, we have provided in our general layout possibility for further expansion, as I have explained.

Mr. Wanchoo

In designing this layout you kept in mind the possibility of this further expansion ?

Mr. Goubert

Yes, we did.

Mr. Wanchoo

May I ask one more question ? This cooling pond that has been provided. Would it interfere in any way with the further expansion ? Supposing we substitute this cooling pond with cooling towers, then all that space becomes available.

Mr. Goubert

We have analysed various alternatives of the water supply system for the Bokaro Steel Plant—the alternative of water supply system consisting of a

number of local close cycles, cooling towers, also with one cooling pond. We have worked out the economics of all the alternatives, for cooling towers as well as cooling ponds. We have come to the conclusion that the alternative of having two cooling ponds is the most economical. The capital investment will be only a little higher. But due to lower operational costs than the cooling towers, the investment cost, extra, will be worked off in three or four years. The operation of the cooling ponds is extremely easy. There is no electric power, no equipment. The staff required is quite small. The operation of cooling towers is complicated. You have to have considerable staff for servicing of the cooling towers. And these cooling towers comprise a considerable amount of equipment requiring repair and maintenance. So the operation cost will be high for cooling towers. Therefore we thought it advisable to recommend to you the alternative of water supply with cooling ponds. I must say that this point has been studied in detail, very great detail by our specialist design organisations dealing with water supply and by our higher technical authorities. Prior to giving you our recommendations we have studied these problems in all its aspects.

As to the location of these cooling ponds. The first alternative was to provide one cooling pond here (north). But this has not been accepted because of the higher capital investment involved in this case in the first stage. This would also cut out the possibility of expanding the plant in this direction. With the proposed location of the cooling ponds, we provided for a good clean zone and water between the township and the steel plant. This is also an important point because the township is located quite close to the plant.

Mr. Wanchoo

You said that the difference in capital cost of the cooling pond and cooling towers is marginal. What is the difference ?

Mr. Goubert

Rs. 30 million. This is a rough figure.

Mr. Wanchoo

Supposing we were to suggest to you that we will consider the cooling towers. Is it possible for you to fit in cooling towers in the present layout without serious difficulty ?

Mr. Goubert

In this case, we have to provide for about 130 cooling towers.

Mr. Wanchoo

What would that involve ?

Mr. Goubert

This would involve modification of the total layout of the plant. We have to provide adequate space for putting up these cooling towers. We have certain notes on the subject. If you would like to scrutinise those notes, we could hand them over to you. For me, it is quite clear. And I would like you also to be clear. We have done quite a lot of work on this

subject and with the assistance of our specialised agencies and so we are quite sure on our points.

Mr. Wanchoo

When could you give us these notes ?

Mr. Goubert

The day after tomorrow morning.

Mr. George

Mr. Goubert has given me a note. Is it an addition to it ?

Mr. Goubert

We have given a note to Mr. George. But in addition we have to work out some more.

Mr. Wanchoo

Thank you. Two more questions. If cooling towers were to be put in, will a substantial change be necessary to the layout ?

Mr. Goubert

There will be considerable modifications. Because space for cooling towers has to be provided, one cooling tower near each unit, we have to shift the tracks, etc.

Mr. Wanchoo

Would that take considerable time ?

Mr. Goubert

It would take considerable time because you have to set up settling tanks, etc., and also in this case you have to change the underground utilities network. We have already started work on this item.

Mr. Wanchoo

In designing this pond, was advantage taken of any natural feature, some depression in the ground, valleys, something like that ?

Mr. Goubert

Yes, they have been taken into account.

Mr. Wanchoo

So it should not involve enormous amount of digging work ?

Mr. Goubert

When we got a topographic survey from India, we made a small raplica of this topograph of the site. We made a model showing all the hills, depressions, valleys, everything and the general layout of the plant was worked

out on this model. We have adopted all the position of our facilities to the contours. We have reduced as much as possible the earthwork. And we have tried to see that everything is done as cheap as possible. The same approach we have used as to the location of the cooling ponds.

Mr. Wanchoo

Do I take it that in your opinion these cooling ponds will not interfere with the future expansion of the plant upto 15 million tonnes ?

Mr. Goubert

They will not interfere.

Mr. Wanchoo

Thank you very much indeed.

ANNEXURE II

(Copy)

M. N. DASTUR & CO. PRIVATE LTD.
CONSULTING ENGINEER
75/48, CHANNAKYAPURI
NEW DELHI-21

4th March 1966
ND 4603-6A.

Shri N. N. Wanchoo,
Secretary,
Ministry of Iron & Steel,
New Delhi.

Dear Shri Wanchoo,

Please refer to your letter Secy/I&S/66-108, of 1st March, 1966.

We note that Government are examining the estimated costs of the Bokaro Steel Project, with a view to seeing whether any cost reductions are possible, and would like to have any suggestion we have in this regard. We assure of our most earnest desire to be of service on this important matter.

We believe that substantial reductions are possible on the cost estimates you have referred to, concentrating solely on the Indian costs. We have already given a general indication of the areas in which modifications would result in reduction, in a note submitted by us to Bokaro Steel last December for the Technical Committee's consideration.

We hope you will appreciate, however, that specific suggestions for cost reduction will require intensive study for some length of time. In our capacity as the Indian Consulting Engineers on this project we could undertake the formulation of cost proposals for consideration by Government.

Even after a selected site, product-mix, plant size and technology were specified, Soviet experts had to put in nearly 18 months of time and effort to arrive at the cost indications in their report. A study of the specific means of achieving substantial reduction in these costs (which in our opinion can be done without impairing the efficiency of the project in any way) would require deploying a large number of our specialists for 2 to 3 months. Because, every modification providing scope for cost savings would have to be examined for the totality of its effect on the project—as facilities in an integrated steelworks like Bokaro are closely inter-connected. Only such a comprehensive study in depth would, we believe, result in concrete proposals, fully supported by proper data.

It may be noted that, apart from effecting substantial savings, the 2-3 months time required for the study now would in no way extend the time schedule already provided for the project. The project's present schedule

depends primarily on the equipment manufacturing and supply programme both in the Soviet Union and in India : these will not in any way be set-back by the cost study. On the contrary, the study would enable further implementation to be undertaken more speedily, and result in the installation of a very economic as well as modern plant.

We must express our puzzlement therefore at your request to send our suggestions in this regard in about a week. You have mentioned in this connection our association with the work of the Technical Committee throughout and that we are therefore fully familiar with the problem. We are indeed familiar with the subject as we had devoted a great deal of effort last December to study the Soviet report, when we submitted our note to Bokaro Steel referred to above. We had also pointed out then that the Technical Committee approach visualised was not suited to the type of analysis required in this situation. As we subsequently mentioned to you the scope permitted for discussions in the Technical Committee confirmed our apprehension as no detailed examination was possible.

We submit that on a project of such magnitude and complexity, and of such importance, at least 2-3 months should be allowed now for examination and formulation of possibilities. Had our study commenced in early December, as we had proposed immediately the Soviet report was submitted (and the high cost estimates became known) it would have been available by now for Government's examination. Any attempt at this stage to take short-cuts and give off-hand estimates and suggestion, on the basis of a hurried study would, we believe, only create confusion and misunderstanding, which is to be avoided.

We may also submit in this connection that the study suggested would be undertaken with the clear understanding that it would in no way impair the overall technological concept or the main production features of the project. Indeed, such an examination, undertaken in a professional way, would enable acceptable proposals to be arrived at.

Once again may I express our earnest desire to assist and co-operate on the important examination that Government is making. We should reiterate that, apart from greatly improving the economics of the project, the study suggested would help in expediting its completion. We now respectfully await your further instructions in this matter.

Yours sincerely,

Sd/-

(M. N. DASTUR)

ANNEXURE III

HINDUSTAN STEEL LIMITED
CENTRAL ENGINEERING & DESIGN BUREAU

CDB-CE(BSL)/273
March 5, 1966.

R. P. SINHA
CHIEF ENGINEER

Dear Shri Wanchoo,

Please refer to your teleprinter message dated 1st March, 1966 asking for any suggestions I may have to reduce the Bokaro Cost estimate beyond those recommended by the Technical Committee.

2. As a member of the Technical Committee, I had the opportunity to go through the broad aspects of the plant and equipment, layout, services and other facilites provided in the Detailed Project Report prepared by Messrs. GIPROMEZ OF USSR. I came to the conclusion that the Plant is well laid out, the processes proposed are sound and equipment selected are essential and adequate. Therefore, I am not in a position to offer any suggestions by way of change of designs or the scope and extent of the equipment and facilites proposed which will reduce the cost.

3. Time schedule, however, has a bearing on total costs. Reduction in the overall time schedule will automatically decrease the cost in such areas as price escalations, management and engineering costs and capitalised interest. Moreover, reduction in time schedule will give a quicked return on the investment and will thus improve the overall economy which is most important. A period of 7 years for commissioning the Cold Rolling Mills from the date of the acceptance of the Project Report appears too long. Presumably, the long time schedule is given in view of the prolonged deliveries of Indian supplies. There is scope for discussing this again jointly with the Russians and the major indigenous suppliers in an effort to reduce this period.

4. The time taken for the One Million Tonne Rourkela Steel Plant, which has more similarity with Bokaro than the other HSL Plants, was approximately as follows :

(a) Date of acceptance of the ... February 1956

(b) Date of Commissioning the First Blast Furnace ... February 1959

(c) Date of starting steel production ... April 1959

(d) Date of commissioning the Hot Rolling Mills ... September 1960

(e) Date of commissioning the Cold Rolling Mills

(f) Completion of the Plant ... December 1961

It took nearly 5½ years from the date of acceptance of the Project Report to the commissioning of the Cold Rolling Mills. My personal opinion is that six months could have been saved at Rourkela if the management had more experience, and the Plant could have been completed in about 5 years. Of course, the conditions at Rourkela were different from those at Bokaro. The total volume of work at Rourkela was less. The foreign exchange limitations were not so great and almost the entire plant equipment were imported. On the other hand, Indian conditions were less developed and it was a problem to get suitable contractors even for simpler jobs.

5. Taking everything into consideration, I feel that a target of 5½ to 6 years for Bokaro 1.7 million tonne stage is worth aiming at. This will, no doubt, require a change in the concept of procedures and priorities.

6. I have not concern myself with checking the cost figures given in the Detailed Project Report. Such cost figures are based on broad estimates of the various elements of cost building the total and are assumed correct within a margin of 10 to 15%. It is not possible for another agency to check in detail the estimates prepared by the Consultants who prepared the Project Report. However, the management must satisfy themselves that the investment-proposed is reasonable in relation to the return. For this only broad comparisons are required.

7. The Plant cost of Rourkela Steelworks at the one million tonne stage was about Rs. 190 crores. Its expansion to 1.8 million tonne stage will cost another 105 crores. The cost of similar plant to be erected to day can be roughly worked out by adding escalation and additional customs duties to the Million Tonne costs and the Expansion costs. The additional customs duty apply directly on imported items and indirectly on indigenous goods by way of increased prices. The total cost for 1.8 million tonne Rourkela Steel Plant in terms of present cost would be something of the order of Rs. 390 crores. The investment cost per annual tonne of ingot would work out to Rs. 2160/-. The investment cost of Bokaro Steel Plant for 4 million tonne stage works out to Rs. 1934/- per annual tonne of ingot steel, based on the figure of 774 crores of plant cost estimated by the Technical Committee. (Page 16, Table 3 of the Report of the Technical Committee for scrutinising Bokaro Steel Plant Project Report). This is only to be expected since Bokaro has been planned even from the initial stage for a production of 4 million tonnes. Therefore, it can be said that from overall investment point of view the cost is not unreasonable.

8. Before concluding I would like to give my opinion on another point raised at Delhi. The Government seem to be concerned that the Plant lay-out is not suitable for expansion to 10/12 million ingot tonnes. In my opinion, the scheme proposed by GIPROMEZ is eventually capable of rational and economic expansion to a capacity of 10/12 million ingot tonnes from the technical point of view. But, I do not believe it would be desirable to expand to that capacity in the foreseeable future in view of the tremendous administrative and coordination problems involved in managing a Plant of this magnitude.

9. I am endorsing a copy of this letter to George.

With kind regards,

Yours sincerely,
Sd./-
(R. P. SINHA)

Shri N. N. Wanchoo,
Secretary,
Min. of Iron & Steel, New Delhi.

cc : Shri K. M. George, Managing Director, BSL, Calcutta.

ANNEXURE IV

Points for Clarification from Mr. Goubert, Director, Gipromez, and his Team

1. The capital investment for plant proper at 1.7 million tonnes stage is indicated to be about Rs. 5600 million and at the 4 million tonne stage about Rs. 8090 million, excluding deferred charges and capitalized interest. It has further been indicated that the capacity can further be increased to 5.5 million tonnes with an additional investment of about Rs. 900 million. This, to some extent, is attributed to in-built capacity. Is it possible to give any indication as to what is the extent of the capital cost in respect of in-built capacity attributable to

(i) 1.7 million tonne stage; and

(ii) 4 million tonne stage ?

2. The Project Report has been prepared no doubt on the assumptions given in the design assignment *e.g.*, the installation of 100-tonne converters in the 1st stage and rolling mill 2000 mm. Irrespective of these and other limitations in the design assignment, could you suggest any avenues of economy.

3. The revised cost of water supply now indicated is Rs. 315.6 million whereas according to Dastur & Company's Report, the total cost of water supply is indicated to be Rs. 117 million. Could it be possible to indicate to what this higher cost is attributable to ?

ANNEXURE V

Record of discussions held in the Committee Room No. 299, Udyog Bhavan, New Delhi, on Friday, 4th March 1966, at 3.00 p.m.

PRESENT

Mr. K. L. Ghei
Mr. Ajit Mozoomdar
Mr. K. M. George
Mr. V. Ramachandran
Mr. H. S. Gill
Mr. Goubert
Mr. Gregoriev
Mr. Manasevich
Mr. Brezgol
Mr. Trubytsyn
Mr. Mescheriakov
Mr. Ananian

Mr. Ghei

I would like to ask some questions. But at the outset, I would like to make it quite clear that it is not in a spirit of criticism that we are approaching you and asking these questions.

By comparison with other estimates and costs that we have, it appears that your estimates are quite high. This question we are asking you not for the sake of criticism but we have to submit these estimates to our Government for approval. We have been asked to investigate why cost estimates are high. The Soviet side has prepared the Project Report in accordance with the Design Assignment which we had given. My colleague here has set out three questions. May be in the course of discussion, he may like to ask more questions. We would like to know the full implications about the cost. We would not be anxious to just reduce a certain estimate which would not result in real reduction in cost. It is against this background that we are seeking to understand the full implications about the cost. We had with us the Dasturco Project Report and we had at one time with us US Steel Report on Bokaro. It is also our impression that as compared to the Rourkela Steel Plant, of course only 1.8 million at this stage, these estimates are somewhat higher. Of course certain amount of escalation would be taken into account. Our impression is that this estimate is high. We know some of the reasons, but still after taking those into account, we find that something requires further explanation and that is why we have asked these questions.

Mr. Ghei

Of course we are aware that some of these estimates were prepared some years ago and an element of escalation will be there. But even taking into account our impression is that this estimate is high. We know some of the

reasons, but even after taking these into account we find that some things require further explanation. That is why we have set down these three questions.

Mr. Goubert

Prior to discussing the points point by point, I would like to make a general statement as to the project as a whole. The Detailed Project Report for the Bokaro Steel Project has been prepared on the basis of the Design Assignment, and the decisions on all the technical aspects of the steel plant were taken in compliance with this Design Assignment. What has been main objective in preparing the Detailed Project Report? We had to ensure a high technical level of the plant, so as to provide for both technical and economical performance of the new plant. As we all know, for a steel plant the greatest importance is* And from the analysis given in our Project Report, you can see that the economic performances of our plant are much better than those provided for in the other project designs. As an example, you can see that with the same tonnage of ingot steel, our output of rolled products will be 350-400,000 tonnes higher. We have also provided for a high labour not only the capital cost but also the cost of operation of the steel plant. productivity. And so on and so on. We could give you a number of other examples characterising the high technical level of the plant. Our second object was to reduce as much as possible the cost of the steel plant. We have taken all the possible measures to reduce the equipment, number of items and the cost of this equipment. Our cost estimate has been based on the cost of equipment supplied from the USSR and also we have based our cost estimate on all the rates handed over by the Indian side of all kinds of construction work, building materials, and so on. Our Detailed Project Report has been scrutinised by our higher technical authorities in the USSR and I must say that our technical authorities is a severe organisation and has scrutinised our Detailed Project Report very strictly. All our detailed project reports are submitted to this organisation. As I have already said, this organisation has scrutinised our Detailed Project Report in all its aspects including costs. Since the Bokaro Project is a very important one not only for India but for us also, the scrutiny of the Detailed Project Report has been done with the assistance of our specialised organisations and our research institutions. What I want to say is that we have submitted to the Indian side a Detailed Project Report that has been thoroughly scrutinised in the USSR. The cost of the plant should not be analysed as a whole but point by point. It is necessary to analyse first the cost of the full development of the plant. The next point is to compare the cost of the Bokaro Steel Plant with the cost of other plants or projects. We should also compare the cost of the Bokaro Steel Plant with world practice. Of course you were right in telling us that roughly 1% of the cost of the Bokaro Plant is equal to the cost of a machine tool plant. But you have to keep in mind that these require high capital investments. You should also keep in mind that you cannot get the products out of this plant very soon. It requires a certain time to set up such a plant. We know this well because our steel industry, as you know, has been built up in rather a short period of time.

Let us now analyse the total cost of the plant estimate given. We tried to find out if we had incorporated something excessive, something surplus not strictly required into our design of the plant. We have done this analysis thoroughly and we have not found anything surplus. The scope of steel plant incorporated in the Detailed Project Report is the scope that

is stricly required to ensure good performance of the steel plant. I can tell you that we have tried many times to simplify the plant. We have submitted our Detailed Project Report to your Technical Committee set up for this purpose. The Technical Committee after scrutiny of our Detailed Project Report has made some observations, which you are well aware of. We have agreed with many of these comments and we have agreed also to incorporate them in further designing. But even taking into account all these slight modifications, it will not be possible to reduce somewhat substantially the cost of the plant because of the nature of the plant. First you have studied the report of theTechnical Committee and you know that they have modified some items of the cost. For instance, you know that the decision has been taken to supply about 60% of equipment manufactured in India. Of course, this is quite correct and we have no objection. This is the right course to take. But the cost of this equipment has been fixed not on an economic basis but somewhat at random. We had first fixed this cost 25% higher than the Soviet equipment supplied *c.i.f.* Calcutta. Now this price has been increased upto 45% more than the price of Soviet equipment. There is nothing we could do in this respect. The cost of transportation of the equipment within India has been also modified. This cost was somewhat reduced as compared to the figure adopted in our Detailed Project Report. The cost of erection of 1 tonne of equipment also has been reduced. Also they have somewhat reduced the rate for the earthwork and a number of items. As a result of all these adjustments, we arrive at the following figure. Rs. 7300 million instead of 7700 million. This is the position with the cost of the 4 million tonne plant.

I would like to say a few words concerning the cost of the first stage of the plant. You remember, that in the Design Assignment it was stipulated that we had to provide for continuous development of the plant. So our task was to prepare a Detailed Project Report for a 4 million tonne plant including the first stage of development. We had to prepare a Detailed Project Report for a plant providing for all the utilities, roads, railway tracks, etc., necessary for the 4 million tonne plant. This was required to provide for your condition, continuous development of the plant. This has been quite correct. This was the right way to proceed with the design of such a plant. Not only utilities but we had also to design some shops of the plant from the start for the 4 million tonne stage. For the capacity of the first stage, we had to provide a slabbing mill for 4 million tonnes, hot rolling mills and also cold rolling mills. The reason was that technically we could not subdivide the rolling mill facilities into the first stage and the second stage Because of this a considerable portion of the total capital investment has to be in the first stage. The position is due to all those reasons at the first stage of development we have necessary margins, in our capacity, which are technically necessary for further development of the plant. From the technical point of view, we cannot do without those capacity margins. This is what I wanted to say in respect of the estimated cost of he plant.

As to the comparison with other Project Reports which have been prepared. There are in all three project reports in India on the 4 million tonne plant. These are our Project Report, the Project Report of Dasturco and the Project Report of U.S. steel. All these three Projects Reports have been prepared at different periods of time and based on different conditions. Of course, considering this, it is not possible, it would not be correct to compare the absolute cost figures. To do such a comparison, it is first necessary to have comparable items, and to

arrive at such comparable items, it is necessary to adjust the estimates which were prepared in each of the Project Reports. As you know, each Project Report provided for a different portion of supplies from India and from other countries and in connection with this the cost of transportation of this equipment in India was different. This should be excluded from comparison. Also each one of these estimates stipulated different sums for unforeseen jobs. These unforeseen jobs should also be excluded from comparison because they are not based on anything firm. And obviously the cost of equipment incorporated in all these Project Reports has been assumed according to prices existing. But as you know we have assumed that Indian supplies in our case will amount to 60% with an increase of 45% as compared to world prices. To be able to compare the cost of the equipment, this increase of 45% should be also excluded or cut out from our estimate. Finally, our estimate is based on existing world prices and in the last two or three years there has been escalation of about 10% in the world prices. There has also been considerable increase in the cost of construction and erection work in India. You should take into consideration that we have provided in our Project Report for the establishment of the complex of blast furnace No. 5 for production of foundry pig iron and such a furnace has not been provided in the other Project Reports. On this basis, with these adjustments, in comparing the three estimates we arrive at the following investment per tonne of steel. According to the USSR Project Report, the capital costs amount to Rs. 1260 per tonne, at the 4 million tonne stage. According to the Dasturco Project Report , the capital costs amount to Rs. 1150 per tonne. According to the US Steel Project Report, the capital costs amount to Rs. 1290 per tonne. As you can see, our estimate is lower than one and higher than the other. I would not like to go here into detailed analysis of Dasturco Project Report. We have done this last year, and we have given our conclusions based on this analysis and the Government of India has agreed. But I would like to make a general statement that Dasturco Project Report does not provide for all the items and many items have been omitted in the estimate. I would not like to go into details here. But if you would like us to do this, we are ready. Our opinion is that the Project Report of Dasturco has not been worked out in necessary detail, and if it is worked out in detail the estimate would also be higher. One more thing. I have given you the capital investment per tonne of steel. But I have given you these figures on ingot steel. I would like to give the capital investments per tonne of finished product. According to our Project Report, it is Rs. 1570 per tonne; according Dasturco Report it is Rs. 1550 per tonne; and according to US Steel report it is Rs. 1780 per tonne. The Dasturco figure appears to be slightly lower than ours. but only appears. As I have said, if you go in more detail and estimate, it will be higher than ours. Let us compare our figure and the American figure. Our capital investment is lower than the American figures. This is due to the conception of our Project Report, and by this technical conception we are able to get out of 4 million tonnes of ingots 3.2 million tonnes of finished product, while the Americans on the basis of the same ingot capacity get 2.9 million tonnes of finished product. That means that our mill give 300,000 tonnes more of finished products. Perhaps due to this the cost estimate of some items has to be higher. But the capital investment per tonne of finished products is lower.

I would like to say a few words as to the comparison of the Rourkela 1.8 million tonne stage and Bokaro 1.7 million tonne stage. If you compare the absolute estimates, then the capital investments for Bokaro are consider-

ably higher than Rourkela. But considering the margin of capacity incorporated in our plant for further development, in this aspect our capital investments are lower than for Rourkela. You know the reasons for these margins of capacity.

According to world prices, the capital investment per tonne of steel amounts to $ 350. The capital investments provided in our Project Report, in dollars, amount only to $ 310 or 320. This means that our capital investments are lower than the world prices.

This is what I wanted to say in general concerning the cost of the plant.

Mr. Ghei

Thank you very much. This is very interesting. You have given us some figures and some adjustments. I don't know whether it will be too much to ask you to give us how these adjustments have been made.

Mr. Goubert

You mean the modifications for comparison ?

Mr. Ghei

Yes. Adjustments made for comparison. The point is we have taken down the figures you have given but we would like to understand the adjustments a little more.

Mr. Goubert

I have given you all the adjustments.

Mr. Ghei

You have given us all the figures. But if it is possible, you can give us a typed statement. Or we can get it typed.

Mr. Goubert

We have discussed all these items at length in Calcutta and they are available in Bokaro Steel.

Mr. Ghei

What we want are the details. The details are not known to us. If these details are there we can understand them a little better. We do not want to raise points without understanding the figures.

Mr. Goubert

We are here to answer all your questions.

Mr. Ghei

My second point is : you mentioned, if I understand you correctly, about the Dasturco's estimate, that it omitted some figures. Could you give us some major examples. I do not want the details, but some important examples.

Mr. Goubert

I am in a position to give you quite a number of examples, outstanding and details, everything. But I personally would not like to discuss once more the Project Report of Dasturco, since this has been done many times at a higher level.

Mr. Ghei

I can appreciate that.

Mr. Goubert

But still I can give you a couple of examples. The water consumption for all the process requirements of the plant, according to Dasturco Project Report is 3 times less than the actual one. They have envisaged water consumption for the rolling mills of 23,000 cu.m. per hour. According to our calculations, it is 72,000 cu.m. per hour. Of course you understand that for such a low water consumption to be compensated we require higher capital investments. The cost of construction and erection work of the steel melting shop assumed by Dasturco is twice lower than the actual one. We have provided a steel melting shop of the same capacity as that provided by Dasturco, and we are quite sure of our estimate, of our construction and erection, because we have calculated it many times and very thoroughly. We could give you quite a few other examples.

I would like to draw your attention to one more important point. In my opinion this is a very important point, but we have not arrived at an agreement with Mr. George yet. Mr. George says that the cost of the plant should include the customs duty. I cannot agree with that. If the steel plant were set up by a private company, it would be quite correct to calculate also the customs duties. But as the Bokaro Steel Plant is being set up by the public sector I cannot understand why you should have such high customs duty and include this customs duty into the cost of the plant. This additional sum of customs duty amounts to Rs. 700 million. You have said that you would not like to reduce some small items, but you would like to have an overall saving on the cost. Here I give you a suggestion. Do not take into account this Rs. 700 million for customs duty in calculating the cost. Also reduce Rs. 750 million more which is paid for Indian equipment. This 45% has been taken without any calculation. Here you have a way to reduce the cost by Rs. 1,500 million. Here you have a way to reduce considerably the estimated cost of the plant.

As to the questionnaire handed over by Secretary, Mr. Wanchoo, yesterday, I suppose I have given you an answer as to the first point and similarly I have also answered the second point. Now I would like to make some comments as to the third point. You have your doubts as to the cost of the water cooling systems. We have envisaged cooling ponds for the cooling system. We have arrived at this decision only after a thorough analysis of all the alternatives. We have consulted our specialised agencies and research organisations. As I have already said, we have studied a number of alternatives. We have also analysed various positions of the cooling pond on the general layout of the plant. We have also analysed the possibility of using cooling towers instead of cooling ponds. As a result of our study, we have come to the conclusion that the best alternative would be the cooling ponds in this case. Now, briefly the reasons. Servicing of

cooling ponds is much easier. Their operation is very simple. The staff required for maintenance and servicing of the cooling ponds is very small Electric power consumption will be lower. The cooling towers require a considerable amount of equipment which is not required for the cooling pond. The operation of the cooling system with use of cooling ponds will be 25% lower. We have also analysed the capital investments for the cooling ponds and for the cooling towers. The construction of two cooling ponds will cost Rs. 14 million more than the cooling towers. But this difference will be paid off by reduction of the operation costs in one year and half. One more important point in this connection. The main water reservoir, the Tenughat dam, is situated at a considerable distance to the plant. So, with the cooling ponds, we have a large store of water near plant. Therefore we insist strongly on our choice, the cooling ponds.

So I have done my best to answer all the points.

Mr. Ghei

Thank you very much. It is very detailed.

May I go back to item 2? Perhaps our question was not quite clear. You said earlier that your Detailed Project Report was based on the Design Assignment. That is quite correct. In this question, we were wanting to find out if, in your expert opinion, there is anythng in the Design Assignment which added to costs. I appreciate it is not a fair question to ask you because the Design Assignment was prepared by us. But our search for cost reduction causes us to ask such a question. It is really not a criticism of our side because that is what we wanted at that stage. And if it is very costly or proves to be very costly, we can reconsider the position. I hope I have made myself clear.

Mr. Goubert

I understand very well what you are saying. I am interested in the same thing, in reducing the cost. You see, the work of Gipromez is not only appraisal of technical concepts that we incorporate in our projects, but also the cost of those projects. And the same questions you put before me now are also put before me by our Government. So I understand you very well.

The scope of the plant depends on the product-mix of the plant. You have stipulated a product mix. We know India requires cold rolled flat products. And so working back from the finished products, we had to assess the production departments of the plant. As we had been told that we have to produce cold rolled strip of 0.4 mm thick and upto 1800 mm. width we had to select this particular equipment. We had no choice. You have given us your product mix according to the demand in the country, and we had to cope with this product-mix. And so, all the main production departments have been selected according to this product-mix, to assure this production.

I must say that we have our doubts as to the capacity of the storages and stocks, and we have discussed this problem with Mr. George and members of the Technical Committee. In particular, the ore yard. The Design Assignment envisages ore stock of 30 days. In our opinion this stock could be somewhat reduced. But this is a very small figure.

As to the scope of the plant, we had to consider the product-mix and the tonnage, the capacity of the plant, and those factors are the basis for the selected scope of this plant. I would like you to understand that our approach has been quite objective, the approach of a designer. We tried to design a more simple steel plant and one which would cost less.

Mr. Ghei

That answers our point.

One more point. I would still suggest that you give us the calculations of the per tonne costs. You see, Mr. Goubert, we have not only to satisfy ourselves, but we have to satisfy others also. And it will be extremely helpful if we could have these calculations and if possible discuss with you so that we understand them. Of course if you like we can ask Mr. George to be with you. Our figures are somewhat different from your figures.

Mr. Goubert

I suppose that the best thing would be for us to discuss these estimates with Mr. George and to come to some agreement.

Mr. Ajit Mozoomdar

This is only a matter of understanding the arithmetic. It is about four or five steps and it should not take long to understand.

For instance, this 10% price increase. Is this escalating downwards or escalating upwards to compare ?

Mr. George

downwards.

Mr. Mozoomdar

On the unforeseen expenditure, is that included at the same level in the three estimates or excluded ?

Mr. Manasevich

Excluded.

Mr. Ghei

Would it be possible to indicate the figures now ? We can take them down, because these are quite interesting figures.

Mr. Goubert

In order to avoid further discussion, it would be better to work with Mr. George or his colleagues and come to joint conclusion instead of working out two estimates.

Mr. Ghei

We have no objection.

Mr. Goubert

You understand that we got the data on the Dastur Report from Bokaro Steel. We should discuss it together.

Mr. Ghei

Our point is that we do not want two sets of figures. Let this be an agreed figure.

Mr. Mozoomdar

Supposing we were to ask for some changes in the Design Assignment itself. There are one or two theoretical possibilities that I want to mention. Supposing if instead of meeting the full range of products, the wide plate and sheet and strip, if we say that we will be satisfied with a less versatile mill of smaller width, the next below mill of 1750 mm width or so, would it be possible to work out very roughly how much reduction in cost that would mean ?

Mr. Goubert

We can match the cost of our plant with any one of your requirements. But in this case, this will not be a 4 million tonne plant and not a plant intended for turning out cold rolled products. It will be just another plant. And theoretically speaking, if you would give us another Design Assignment, then the construction of the Bokaro Steel Plant will have to be delayed for at least two years. We have to prepare quite a new Detailed Project Report.

Mr. Mozoomdar

Could I understand this is a little clearly ? You say that a change in the final product by eliminating certain widths would mean complete recasting of the whole project. Could you just explain why an adjustment will not be possible ?

Mr. Goubert

All the bases for the Detailed Project Report would be changed in this case—the rolling mill speeds, capacities, etc. We have to provide quite different equipment. The other consumptions, electric power, water and so on will change. This means that all the calculations we have done have to be redone and that means recasting of the whole Detailed Project Report. Unfortunately, it is not possible to do just by adjustment. The whole thing has to be changed.

Mr. Mozoomdar

Would that also be the case if the converter size were to be changed ?

Mr. Goubert

I would like to tell you how I understand your question, this particular question. The reason why we have provided 100-tonne capacity converters. Is it correct?

Mr. Mozoomdar

The question is if instead of 100 tonne converters you put in 130 or 150 or 200 tonne converters, the reason being it would presumably reduce the capital cost per tonne. If this were to be considered, would that also mean the entire project report has to be recast ?

Mr. Goubert

We cannot adopt another capacity converter today because of the following reasons. *We can supply to India all the equipment which has been thoroughly checked up in operation in the Soviet Union. We can supply only equipment which can be commissioned straightaway and which can be easily mastered.* On the basis of our experience at our own steel plants, we are providing 100 tonne converters. Today we are not in a position to supply to India other converters of higher capacities. The 250 tonne converters are now being installed at some of our steel melting plants and we will be in a position to supply them to India after we have gained enough experience in their operation. For the second stage of Bokaro we will be able to supply such converters. We have informed you of this last year when preparing the Design Assignment. I must say that when considering only the first stage of development of the plant, there will be actually some slight increase of capital investment due to the 100 tonne converters. But for the 4 million tonne plant, 100 tonne and 250 tonne converters, both sizes, which we have provided, may give even a slight reduction in the investment for the total plant. But I repeat that the increase in investment at the first stage and the reduction of investment at the second stage connected with the converter shop are very slight.

Mr. Mozoomdar

Could I ask one or two smaller questions, not involving any great changes ?

Generation of power in the plant has been put at 2 sets of 55 MW a back pressure set. Considering that it is possible to link this new plant with at least three different power stations of the DVC, is it possible to do with less generation of power in this ?

Mr. Goubert

Our power supply expert will answer the question.

Mr. Mozoomdar

My point is that if the minimum emergency need was installed for emergency power and the power set is only required to take up some excess gas, then could it be less than this ?

Mr. Brezgol

The thermal power plant is intended mainly for emergency needs, and the minimum number of generating sets at the power plant is two. As you know, one of the generating sets has to be overhauled for inspection and maintenance and so you see two sets are required. The emergency load of the plant is roughly 53,000 Kw. We have taken two sets of 55 MW also to provide for this emergency load and also for burning surplus gas.

Mr. Mozoomdar

Considering that this emergency requirement for the set would only arise if three connections break down when the other set was being down for maintenance, is it too great a risk to do with one set?

Mr. Brezgol

You will have three transmission lines from Chandrapura power station.

Mr. Mozoomdar

Why not a line to Chandrapura and Bokaro and patratu as a part of the electrical development of the area?

Mr. Brezgol

A steel plant cannot be operated without its own turboalternator sets for emergency loads. I can give you an example of breakdown which occurred very recently, the New York power plant.

Mr. Mozoomdar

That happens once in 50 years. In such a case, even the isolating switches of the plant itself might not be working properly or somebody may pull the wrong switch and the plant generators may get burnt out.

Is it your view that even if the steel plant is linked with two or three separate power stations, even then two large sets must be provided?

Mr. Brezgol

Yes. Two sets are absolutely necessary for each plant.

Mr. Mozoomdar

The American report, which of course was not in great detail, had envisaged water supply in a little different way. They seemed to think that if you brought the water by this canal, only a balancing pond, reservoir of some Rs. 8 million was adequate. It is not clear what they meant. But perhaps they meant that the whole water will be passed through a more close cycle. If instead of the make up water the full water were to be taken, is it possible to consider any system without the cooling ponds and towers? I mean, once through.

Mr. Mescheriakov

The Tenughat reservoir can supply roughly 90,000 c.u.m. per hour. For circulation in our close cycle of the plant, we need 220,000 c.u.m. per hour. So you see, there will be a deficit. Therefore straight process is not possible.

Mr. Mozoomdar

Is it possible to have some of the maintenance facilities developed outside the plant?

Mr. Goubert

It may be possible. You can work in coordination with some other plant, say the Ranchi plant. But considering the tremendous quantity of mechanical equipment that is to be installed at the Bokaro Steel Plan, we cannot base our operation on other plants outside. We envisage only the supply

from outside of big parts. The other spares should be manufactured within the plant. Because this is the only means to provide for smooth operation. For operation of this complicated mechanical equipment, the skill of the operators has to be extremely high, and a certain time is required for them to acquire this skill. Before they have mastered all the equipment, there will be many failures and without adequate repair and maintenance facilities there will be no smooth operation of the plant. We have large experience in this field with our plants. We have also started with very small repair and maintenance facilities. But later we have come to the conculsion that we have to envisage adequate repair and maintenance facilities because you cannot rely on the heavy machine manufacturing plants for manufacturing small parts required for operation. We have discussed the maintenance facilities with the Technical Committee, and we have excluded some machine tools, but only a small amount.

Mr. Moozomdar

In the estimate, there is an item called "minor construction costs". This is based on a percentage of the main construction costs. Is it possible to break down this figure to any more detail ?

Mr. Manasevich

It is a variety of small jobs of all kinds.

Mr. Mozoomdar

In our previous construction estimate, we have not added such a category. It is not a part of the unforeseen expenses.

Mr. Manasevich

At the stage of the Detailed Project Report, you are not in a position to provide for all the jobs, to go into every detail which will be required. This can be done only at the stage of the working drawings. Our experience has shown that these small jobs amount to 10—15%. We have assumed the lower figure of 10%.

Mr. Mozoomdar

One small point about the water supply cost estimate. What is the size or capacity of the cooling towers assumed in the comparison ?

Mr. Mescheriakov

For the comparison, we have assumed for the cooling towers the same cooling capacity as for the cooling pond and the same temperature of water.

Mr. Mozoomdar

You see, the number of towers depends on the size.

Mr. Mescheriakov

For the sake of comparison, we have assumed the number of cooling towers as 100 and the size of each set 12 by 12m.

Mr. Ghei

I would like to ask one last question. We have been told that the capacity of the rolling mills and the ultimate capacity of the project is

5.5 million tonnes, and if I am not mistaken, you have indicated the extra investment will be Rs. 900 million after the 4 million tonne stage. I would like to ask whether it is not possible to go from the 1.7 million tonne stage straight to the 5.5 million tonne stage. Or is it necessary that we must stop at 4 million tonnes. Of course we had said 4 million tonnes ourselves in the Design Assignment. If you could kindly explain the implications of my question I will be very grateful.

Mr. Goubert

As you know, our Detailed Project Report envisages continued development of the plant. That means we have prepared the Detailed Project Report for 4 million tonnes. At the same time we have prepared a detailed project Report for 1.7 million tonnes. So after completion of the 1.7 million tonnes, you can continue up to 4 million tonnes without a new Project Report to go from 1.7 m.t. up to 4 million tonnes, you have to add coke oven batteries, blast furnaces, converters, additional. The rolling mills are adequate to take upto 4 m.t. in the rolling mills we have only to add heating facilities and some small items. To go up to 5.5 million tonnes, you have to do the same thing, to add coke oven batteries, blast furnaces, converters etc. and this will require according to our estimate Rs. 900 million. This 5.5 million tonnes may be reached in the same boundaries that are now shown in the General Layout. That means that the actual layout and all the utilities systems have provided for the possibility of this expansion. Besides, the general layout provides also for further considerable development of the plant, above 5.5 million tonnes.

Mr. Ghei

I was only wanting to know if there is any difficulty in our going straight from 1.7 to 5.5 million tonnes.

Mr. Goubert

No difficulties.

Mr. Ghei

Thank you very much Mr. Goubert. I am sure my colleagues are very grateful to you for the patient way you have answered the questions.

Mr. Goubert

One moment please. You know that we could have given the answers to the questions that you have raised today a long time ago. What we have to do, as I understand, is to hand you over a table comparing the costs of the plant. I would request you to speed up as much as possible your decisions.

Mr. Ghei

Can we arrange a meeting tomorrow morning for the table, here if you like ?

Mr. Goubert

Mr. George, could we meet in Bokaro Steel to discuss this ?

Mr. George

Sure.

Mr. Goubert

You (Mr. Ghei) suggest a discussion with the Bokaro experts tomorrow here, or our meetings ?

Mr. Ghei

I was thinking that if we can have the calculations, because we want to work on the same basis, and your experts and some experts from our side can sit down and see how the calculations have been made.

Mr. Goubert

Prior to our meeting?

Mr. Ghei

We need not have a meeting. I would like to have a word with Mr. Wanchoo and I will let you know whether your presence is needed. But let the experts meet tomorrow at 10 a.m.

Mr. Goubert

I take it that this is final, that there will be no more questions except this one.

Mr. Ghei

Don't put it that way, Mr. Goubert. I will say that if there are one or two more questions we would still like to trouble you. But at the moment we have no more questions.

Mr. Goubert

I will be here with the greatest pleasure. But my colleagues, present here, should have left two weeks ago. They are staying incidentally. They will have to leave on Wednesday.

Mr. Ghei

I will let you know tomorrow. We will try to do it earlier than Wednesday.

ANNEXURE VI

Project Cost Estimates for Iron and Steel Works at Bokaro

(Rs. Million)

Sl. No.	Item	Alternative 1 (1.7 million tonnes with cold rolling mills and foundry iron)
1.	Land (4000 acres @ Rs. 2600)	10·40
2.	Site levelling and investigation	97·09
3.	Plant and equipment as erected	4290·21
4.	Engineering and construction :	
	(a) Construction equipment	132·00
	(b) Design, engineering, supervision, including administration during construction, enabling works and starting and commissioning expenses	329·05
5.	Customs duty	411·41
6.	Contingencies	262·99
	Plant cost	5533·15
7.	Deferred charges	42·80
8.	Capitalised interest	..
	Sub-total	5575·95
9.	Offsite facilities	483·75
10.	Additional Spares	141·01
	Project cost	6200·71

Break-up of Plant & Equipment as erected

(Rs. millions)

Sl. No.	Item	Alternative 1 (1.7 million tonnes with cold rolling mills and foundry iron)
1.	Plant and equipment	
	(a) Imported c.i.f.	750·96
	(b) Indigenous	1119·12
	(c) Price preference on (b)	503·54
2.	Cost of Transport, Port Clearance, etc.	
	(a) for imported equipment	23·22
	(b) for indigenous equipment	19·22
3.	Erection cost of equipment	202·54
4.	Other construction costs	1844·81
	Sub-total (1)	4465·41
5.	Reduction in cost as agreed in discussions	53·20
	Sub-total (2)	4410·21
6.	Increase due to additional items	15·00
	Sub-total (3)	4425·21
7.	Reduction in cost due to inclusion of 90% of construction equipment cost under erection rates	135·00
	Total	4290·21

BOKARO STEEL PLANT

Break-up cost

(Value in Millions of Rupees)

Sl. No.	Description of shop	Cost of Equipment		Cost of structurals	Cost of refractories	Civil Engg. Cost	Cost of Port Charges, Transport etc.		Erection Cost			Minor Const. cost	Total Cost
		Imported	Indigenous				Imported	Indigenous	Equipment	Structures	Refractories		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	Coke Oven and By-product Plant	18·85	166·59	24·70	28·26	91·15	0·58	1·97	14·49	3·65	5·88	15·36	371·48
2.	Sulphuric Acid Plant	3·47	11·84	3·76	0·19	5·12	0·11	0·14	1·26	0·59	0·03	0·97	27·48
3.	Sintering Plant	48·98	74·65	40·40	0·61	48·75	1·52	0·88	10·87	6·23	0·22	9·62	242·73
4.	Blast Furnace Plant	11·46	211·47	53·78	46·78	53·13	0·35	2·50	17·04	8·44	5·94	16·81	427·77
5.	Steel Melting Shops (including Converter Shop No. I, Ingot Mould Train Preparation Shop, Scrap Yard and Tar Boiling Plant)	54·70	240·37	53·76	3·69	37·49	1·69	2·85	23·88	8·78	0·38	10·41	438·00
6.	Hot Rolling Mills	260·61	225·07	59·12	11·53	111·16	8·06	2·67	45·04	9·43	2·47	19·37	754·53
7.	Cold Rolling Mills (including block of Chemical Plants)	183·84	121·52	66·84	2·55	102·66	5·69	1·44	28·99	10·70	0·20	18·30	542·73
8.	Refractories Plant	10·39	39·86	13·62	1·07	22·19	0·32	0·47	4·10	2·16	0·32	3·94	98·44
9.	Repair Shops (including Structural Shop)	39·58	77·49	29·23	0·81	30·67	1·22	0·92	10·08	4·71	0·18	6·56	201.45
10.	Mechanical Transport and Storage Facilities	13·66	144·37	32·19	0·02	59·49	0·42	1·71	12·26	4·99	..	9·67	278·78
11.	Gas Supply Facilities (including Oxygen Plant)	15·46	17·97	33·13	0·64	25·88	0·48	0·21	3·02	4·76	0·04	6·45	108·04
12.	Utilities (including Thermal Power Plant and Turbo-Blower Station and Steam and Comp. Air Facilities)	48·87	83·02	15·08	0·29	47·13	1·51	0·98	11·49	2·27	0·10	6·49	217·23

1	2	3	4	5	6	7	8	9	10	11	12	13	14
13.	Electric Power Supply .	14·48	96·30	5·39	..	11·09	0·45	1·14	8·76	0·79	..	1·73	140·13
14.	Water Supply and Sewerage	16.50	23.32	5.19		334.61	0.51	0.28	3.53	0.75	..	34.05	418.74
15.	Transport Facilities	7·70	68·08	1·41		50·04	0·24	0·81	5·92	0·22	..	5·17	139·59
16.	Other Units (including Laboratories, Instrumentation, and Auto Machine Shops, Processing & Production Control Centre, Communication Facilities, Training Centre, etc.	2·41	20·74	2·27	..	25·55	0·07	0·25	1·81	0·37	..	2·82	56·29
		750·96	1622·66	439·87	96·51	1056·11	23·22	19·22	202·54	68·84	15·76	167·72	4463·41
	Total cost	4463·41											
	Reduction in cost as agreed in discussion	53·20											
		4410·21											
	Increase in cost due to additional items	15·00											
		4425·21											
	Less Rs. 135·00 million—cost of construction equipment chargeable to erection and const. costs	135·00											
	PLANT & EQUIPMENT AS ERECTED Rs.	4290·21 million											

NOTE : The total weight of equipment is 289,350 tonnes and total price is Rs. 1,870 million. This gives an average rate of Rs. 6,463 per tonne. This average rate has been adopted for estimating the cost of individual units of the plant under items 1 to 16. The rolling mill equipment is much more expensive than equipment for coke ovens, blast furnaces and steel melting shop. In view of this, the breakdown of equipment costs given in this table is to be treated as approximate only. The total cost, however, is correct and will not vary.

ANNEXURE VII

Comparison of Cost between Bokaro and Rourkela

NOTE 1. This comparison does not take into account price escalation between the time the actual expenditure was incurred when Rourkela plant was built and now, while Bokaro estimate is based on current prices.

2. Bokaro estimate for individual units of the plant has been prepared on the basis of weighted average rate per tonne of equipment, as break-up of costs department-wise is not available. Therefore, for purposes of comparison, costs of coke ovens, blast furnaces and steel melting shop are to be reduced at least by 10%, and the cost of rolling mills increased by about the same percentage.

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COMPARISON OF COST BETWEEN BOKARO AND ROURKELA

(March 14, 1966)

Plant	Description of plant		Cost in million of Rs.			Capital cost per tonne of Production		Remarks
	Bokaro 1·7 m.t.	Rourkela 1·8 m.t.	Bokaro 1·7 m.t.	Rourkela 1·8 m.t.		Bokaro 1·7 m.t.	Rourkela 1·8 m.t.	
1	2	3	4	5		6	7	8
I. Coke Oven & By-product Plant	4 batteries of 69 ovens each = 276 ovens. Coal through put 3·344 m. t/yr. By-product plant to treat gases from these batteries and a sulphuric acid plant.	4 batteries total 290 ovens. Coal throughput 2·38 m.t./year. By-product plant to treat gases from all batteries and a sulphuric acid plant.	510·46 +25·57 536·03 —6·43 529·60	(5% for supervision engg., etc.) (1·2% for total reduction of 53 m.)	286·918	Rs. 158·50 per tonne of coal carbonised.	Rs. 120·50 per tonne of coal carbonised.	Coal throughput from Bokaro battery is high. 40% of the Mechanical Handling and Storages cost is added to Bokaro estimate.
II. Blast Furnace	3 B. F. of 2000 cbm each. Production 2·753 m.t./yr.	3 1000-t/day and 1 1500-t/day capacity. B. F. production 1·6 m.t/year.	567·16 +28·36 595·52 —7·15 588·37	(5%) (1·2%)	209·393	Rs. 214·00 per tonne of hot metal.	Rs. 130·00 per tonne of hot metal.	A considerable portion of Bokaro's production is foundry grade. 50% of the Mechanical Handling and Storages cost is added to Bokaro estimate.
III. Steel Melting shop and Auxiliaries	4 100-t converters production 1·7 million ingot tonnes.	3 50-t converters 2 60-t converters and O. H. furnaces 1·8 m. ingot tonnes.	465·88 +23·29 489·17 —5·59 483·58	(5%) (1·2%)	223·463	Rs. 284·00 per tonne of ingot.	Rs. 124·00 per tonne of ingot.	Rourkela has smaller converters, smaller cranes and no provision of future expansion. Converters at Bokaro have automatic control and are fitted with

									waste heat boilers. Elaborate mould and scrap preparation facilities included at Bokaro. Though the complete building will be erected at this stage only 4 converters will be installed now for a future 5 converter shop. A slag yard is included at Bokaro. 10% of the Mechanical Handling and Storage cost is added to the Bokaro cost.
IV.	Hot and Cold Rolling Mills	Soaking pits, Slabbing mill, hot strip mill, pickling line, tandem mill, annealing and hot dip galvanising Finished product: 1·364 m.t./year.	Soaking pits, slabbing mill, hot strip mill, pickling, tandem and reversing cold rolling mills, cont. and batch annealing, tinning and cont. galvanising (without plate mill and elec. sheet mill) Finished product: 1·234 m.t./year.	1297·26 +64·86 (5%) 1362·12 —16·37 (1·2%) 1345·75 +15·00 (for depiler) 1360·75		1123·159	Rs. 985·00 per tonne of finished product.	Rs. 15·00 per tonne of finished product.	Hot and cold rolling mills have capacity to roll upto a stage of 5·5 million tonnes with addition of only auxiliaries like soaking pit, annealing and reheating furnaces. The finishing facilities at Rourkela however are more than Bokaro.

NOTE : 1. Cost of Rourkela is sum of 1 million tonne stage and 1·8 million tonne expansion without customs duty and offsite facilities. No adjustment has been made for rise in price of Indian and foreign equipment during the last 10 years.

2. 5% instead of 7-1/2% has been added to Bokaro cost for supervision etc.as Rourkela cost includes only supervision and part of engineering but not enabling works and consultants' fees.

ANNEXURE VIII

Comparison of Cost between U.S.S.R. and Dasturco Estimates for Bokaro Steel Panel
(4 Million Tonne Stage)

Plant	Description of Plant		Cost of Millions of Rs.		Capital Cost per tonne of production		Remarks
	Dasturco	U.S.S.R.	Dasturco	U.S.S.R.	Dasturco	U.S.S.R.	
Coke Oven & By-Product.	5 batteries of 90 ovens each = 450 ovens. Coal throughput 5·00 M/T.	7 batteries of 69 ovens each = 483 ovens. Coal throughput 5·57 M/T.	452·81	574·94	Rs. 90·56 per tonne of coal carbonised.	Rs. 101·30 per tonne of coal carbonised.	
Blast Furnace	4 B. F. of 2100 t/day capacity. Production 3·92 M/T. per year.	5 B. F. of 2000 m useful volume. Production 4·585 M/T per year.	318·75	615·17	Rs. 81·30 per tonne of hot metal.	Rs. 134·00 per tonne of hot	A considerable portion of pig iron in U.S.S.R. design is foundry grade.
Steel Melting Shop and Auxiliaries.	4200-L. D. converters Production 4·00 M/T. per year.	5 100-t and 2 250-t L. D. converters. Production 4·00 M/T. per year.	494·40	844·54	Rs. 123·80 per tonne of ingot.	Rs. 211·13 per tonne of ingot.	The U.S.S.R. design can expand to 5·5 million tonnes with comparatively small additional costs.
Hot and Cold Rolling Mills.	Soaking pits, Slabbing Mill, Hot strip Mill, Cold Mill and Strip finishing Finished product 2·92 million tonnes per year.	Soaking pits, Slabbing Mill, Strip Mill, Tandem Mill, Annealing and Hot-dip galvanising Finished product 3·22 million tonnes per year.	1590·71	1979·16	Rs. 547·00 per tonne of finished product.	Rs. 614·00 per tonne of finished product.	Hot and cold rolling mills in U.S.S.R. estimate have capacity to roll upto 5·5 million tonnes.

NOTE.—No adjustment has been made for increase in costs since the Dasturco estimate was prepared.

ANNEXURE IX

Comparative Statement of Rates

Sl. No.	Description of work	Unit	Rate as adopted in Bokaro Estimate	Bhilai expansion M/s. Hindustan Construction Company Rates		Rourkela Expansion Rate M/s. KcKenzies (Zone-I) & M/s. Uttam Singh Duggal (Zone-II)			Dasturco rates		Remarks
1	2	3	4	5		6			7		8
1.	Excavation for foundation pits and trenches and disposal within 100 M lead.			Rate varies from Rs. 6·65 to Rs. 11·82. For comparison, take average rate=	Rs. 9.23	Rate varies from	6·00	6·72	Rate varies from 2·50 to 6·90		
						to	10·00 to	15·00			
							8·00	10·86			
				Deduct cost of back filling= (not included under this item) Comparable rate	Rs. 2·30	.·.Av. rate Deduct for back filling	2·30	2·30	Av. rate	4.70	
					Rs. 6·93		5·70	8·56			
						Rebate 5%	0·29	0·34 (4%)			
							5·41	8·22			
		M³	6·50		6·93		5·41	8·22		4·70	
2.	Do. Hard Rock			Item E/10	Rs. 19·47	Item E/8	25·00	16·80	Item 1·15	15·50	
						Rebate 5%	1·25	0·67 (4%)			
							23·75	16·13			
		M³	20·00		19·47		23·75	16·13		15·50	

1	2	3	4		5	6		7	8
3.	Back filling	M^3	2·30	Comparable rate	Not available	—	—	Item 1·25 (a)	2·30
4.	Transfer of soil by automobiles to a distance of 5 Kms.			Item No. E/14= 0·23×9 = 2·07 & E/15 0·57 × 16 = 9·12 11·19	Item No. E/15 Item No. E/16 Rebate 5%	3·00 4·00 7·00 0·35	2·80 4·48 7·28 0·29 (4%)	Item 1·6	4·50
						6·65	6·99		
		M^3	4·5	11·19		6·65	6·99		4·50
II.	*Masonry*								
5.	Rubble stone work for belt and column foundations.			Item M/2 71·54	Item M/2 Rebate 5%	65·00 3·25	84·00 3·36	Item 6·1 (a)	60·00
						61·75	80·64		
		M^3	65·00	71·54		61·75	80·64		60·00
6.	Brickwork for walls, columns and channels.			Item M/9 (50 mark) 70·04 Item M/10 (75 mark) 72·58	Item No. M/4 (50 mark) Rebate 5%	65·00 3·25	73·00 2·92 (4%)	Item 6·4 (b)	68·50
						61·75	70·08		
		M^3	70·50	70·04 and 72·58		61·75	70·08		68·50

7. Brickwork for partitions and filling.			Item M/14	77·26	Item M/7	71·43	110·00	Item 6·6 (b)		74·00	Our rate is inclusive for all lifts.
					Rebate 5%	3·57	4·40	(4%)			
						67·86	105·60				
						67·86	105·60				
	M³	84·00		77·26						74·00	
IV. *Concrete and Reinforced concrete Works*											
8. Concrete bedding for foundations.			Item C/2	105·60	Item C/1	100·00	79·00	Item 2·3 (a) (i)		75·50	
			Add for difference in cost of cement from Rs. 142·40 to 157·00 per M.T.	2·58	Rebate 5%	5·00	3·16	(4%)			
				108·18		95·00	75·84				
						2·58	2·58				
						97·58	78·42				
	M³	75·50		108·18		97·58	78·42			75·50	
9. Concrete foundations for building & structures.			Item C/6	125·00	Item C/3	120·00	108·00	Item No. 2·1(c)		104·00	
			Item C/13—extra for depth upto 5 M.	2·00	Extra for depth up to 5 M—C 11	3·00	5·60		Extra for depth 2·2	1·25	
			Extra for vibration provided for—based on C/19(a)	4·65		123·00	113·00			105·25	
				129·65	Rebate 5%	6·15	4·54 (4%)				
						116·85	109·06				
						3·98	3·98				
						120·83	113·04				

1	2	3	4	5		6			7		8
				Difference in cost of cement from Rs. 142·40 to 157·00 per M.T.	3·98						
					133·63						
		M³	135·50		133·63		120·83	113·04		105·25	
10.	R. C. foundations for buildings and structures.			Item C 7	125·40	Item C 6	122·00	112·00	Item 3·1(a)(i)	105·00	Dastur's rates are not strictly comparable as rates do not exist for all extra items.
				Item C 9 (a) puring & vibration	4·65	Additional depth C 11	3·00	5·60			
				Extra for depth C/3	2·00	Pockets C-26(10)	25·00	34·00	Extra for depth 3·2	1·25	
				Extra for stone chips 40 mm. & down	0·93		150·00	151·60		106·25	
				Leaving 2 pockets C 32—2×6·60	13·20	Rebate 5%	7·50	6·06 (4%)			
				Extra for depth for pocket	4·00		142·50	145·54			
				Difference in cost of cement	3·98	Add difference in cost for cement	3·98	3·98			
					154·16		146·48	149·52			
		M³	157·00		154·16		146·48	149·52		106.25	
11.	R. C. Foundations for Equipment.	M³	160·00	Same as Item 13			—	—			

12. R. C. C. structures for Industrial Buildings, columns, Girders, Slabs, Floorings, Walls etc.	Av. rate for item C 8 & C 10 with 75 mm & down graded. (123·00+125·40)/2 = 124.20		Item C 7 with 40 mm & down metal	*Zone-I* 125·00	*Zone-II* 120·00		
			Item 13—Extra for using 19 mm & down metal	2·00	11·20		
	Item C 16—Extra for metal of sizes 20mm down 2·33		Item C/26(c) Extra for pockets (½ m depth)	15·00	25·00		
	Item C 19(a)—Extra for pouring and vibrating	=4·65 Rebate 5%		142·00 7·10	156·20 6·25	(4%)	
	Item C 32—Extra for pockets (2 Nos. avg.)	=13·20		134·90	149·95		
		144·38					
	Add difference in for cement.	4·42		4·42	4·42		
		148·80		139·32	154·37		
M³ 157·00		148·80		139·32	154·37		

1	2	3	4	5		6		7	8
13.	R. C. Structures for tanks, pipes, bins, bunkers, bridges, tunnels, silos etc.			Item C 11 with mark 150	132·50	Item C 10 with 40 mm & down metal with 150 mark	150·00	140·00	
				Item C 17 extra for mark 200	10·73				
				Item C/16 extra for metal of sizes 20 mm & down	2·33	Item 13—Extra for using 19 mm and down metal	2·00	11·20	
				Item C 19(a)—extra for Pouring and vibrating	4·65				
						Item C 14 extra for 200 marks	11·00	10·00	
				Item C 32 extra for pockets (1 No. avg.)	6·60	Item C/26(c) extra for pocket(½m)	7·50	12·50	
					156·81		170·50	175·70	
							8·52	6·95 (4%)	
							161·98	166·75	
							5·23	5·23	
				Add difference in cost of cements	5·23	Rebate 5%	167·21	171·98	
					162.04				
		M³	160·00		162·04				

14. Precast R. C. Structures for Buildings and Structures.			Item C/34 Mark 150 Including reinforcement & erection	440·00	Item C/27 (Mark 250) including steel and erection	600·00	325·00		Our rates do not include reinforcement and erection charges.
					Rebate 5%	30·00	13·00 (4%)		
						570·00	312·00		
	M³	200·00		400·00		600·00	312·00		
15. Prestressed concrete structures.	M³	800.00	Not available		Not available				
16. Reinforcement			Item C/21	1,197·00	Item C/17 (a) & (b)	Varies from 1250·00 to 1350·00	1344·00	1100·00	Our rate provides for steel at the rate of Rs. 860 per tonnes as against Rourkela's Rs. 800 per tonne.
					With rebate 5%	1187·50 to 1282·50	1290·24 (4%)		
	Tonne	1350·00		1,197·00	Rs. 1187·50 to Rs. 1282·50	1290·24	1100·00		

1	2	3	4	5	6			7	8
17.	Shuttering for Concrete works.			Item C/24 to C/27 Varies from Rs. 16·30 to 23·60 for silos and bunkers etc.	Item C/21 to C/24 from	15·00 to 20·00	12·32 to 20·00 (4%)	Items 5·3 varies to 5.7 from Rs. 8·00 to 12·50 With extras for lift and curved shuttering.	
		M²	14·00	Rs. 16·30 to 23·60	From Rs.	15·00 to 20·00	From 12·32 to 20·00	Rs. 8·00 to 12·50	
18.	Grouting for Equipment.			Item C/56 per M³ Grouting done in cement sand slurry. 200·00	C/34 and C/36 Per m³ and with usual rebate of	250·00 250·00 5%	208·00 316·00 4%	Item 2·13 Varies from 200·00 to 275·00 per M³	Our rates are on sq. metre basis.
		M²	38·00	200·00		Do.	Do.	Do.	
19.	Supplying and Fixing of Inserts.			Items C/21(A) and 21(B) 85·00 1543·00 1628·00	Item C/33(b) Item C/18 Erection	2000·00 250·00 2250·00	1960·00 1120·00 3080·00	Not available	

			M/s]HCC have quoted against 21(B) for Inserts from recoverable steel.	1690·00	Rebate 5%	112·50 2137·50 2137·50	123·20 (4%) 2956·80 2956.80				
		Tonne	2500·00		1828·00			—			
7. Steel Structures.											
20.	Steel structures for Shop building.	Tonne	2100·00	—	—	—	—	—	Item 11·3	1650·00	
21.	Roofing and wall cladding with corrugated steel sheets.	M²	18·00	Item RI to R5 Varies from Rs. 12·00 to Rs. 26.92 for gauges 24 to 16.		Not available			Item 11·10 Varies from Rs. 14·00 for gauges 24 to 20.		Our rate is inclusive of wind ties.
22.	Sashes, doors etc.	M²	97·00	Not available.		Rate for fixing only Rs. 15·00/M² and Rs. 20·00/M² excluding rebate.			Item 100·19 10·20 & varies from Rs. 90·00 to Rs. 120·00.		
23.	Structures for Pipe lines, bins, Trestles etc.	Tonne	2200·00	Not available.		—	—	—	—	—	—
24.	Painting of structures (with aluminium & other paints).	M³	4·50	Labour charges.	Rs. 1·46 only	XF/39 Priming cost XF/42 Rebate 5%	*Zone I* 1·50 2·60 4·10 0·20 3·90	*Zone II* 2·00 3·50 5·50 4% 0·22 5·28	Item 12·1 Item 12·3	0·90 2·30 3·20	

1	2	3	4	5	6	7	8
25.	Cast structures for metallurgical furnaces.	Tonne	2400·00	—	—	—	—
	VI. Wooden Structures						
					Zone I *Zone II*		
26.	Windows, doors, gates, of teak wood including frames sashes etc.	M^2	95·00	Item W/4 & W/8 varies from 90·44 to 99·60 This rate excludes the cost of fittings and frame.	Item W6 90·00 95·00 Rebate 5% 4·50 4% 3·80 85·50 91·20 Rates excludes cost frame and fittings.	Item 10·3(a) Cost of fittings and frame not included.	55·50
					Zone I *Zone II*		
27.	Other structures Sal or equivalent.	M^3	900·00	Item W1 & W2 varies from 827·26 to 1044·05.	Item W1 800·00 834·00 Item W2 800·00 907·00 Average rate 800·00 870·00 Rebate 5% 40·00 4% 34·82 760·00 835·68	Not available	Our rate includes cost of frame and fittings.
	VII. Floors and Bedding						
					Zone I *Zone II*		
28.	Stone or Metal bedding for floors,	M^2	26·00	F/1 Rs. 32·40	F1 22·00 22·50 1·10 4% 0·90 20·90 21·60	8·3 (a)	Rs. 19·50

							Zone I	*Zone II*			
29. Concrete bedding for floors.	M^3	86·00	Item C/2	105·00	C1		100·00	79·00	Item 2·4(a)(i)	86·00	
			Add difference in cost of cement	2·58	Rebate 5%		5·00	4% 3·16			
				108·18			95·00	75·84			
							2·58	2·58			
							97·58	78·42			
							Zone I	*Zone II*			
					F 17		8·00	16·00	9·11(a)	13·75	
					Rebate as usual						
30. Cement floor on ready bedding with Ironite flooring.	M^2	14·00	Not available.								
							Zone I	*Zone II*			
31. Same of Mosaic tiles.	M^2	27·00	F/6 to F/8 varies from Rs. 26. 60 to 27·93	F5 to F7	With usual rebate.		22 to 35	22 to 26			
32. Same of C. I. Slabs.	M^2	100·00	Labour rate F/17 only.	15·96	Not available.				Item 9·50 Not available.	25·00	
33. Floors of Moorum	M^2	2·00	Not available.		Not available.				Rs. 10 per Cu.M. as per Item 8·5		
VIII. Roofings											
34. Roofing and walling with asbestos corrugated sheets.	M^2	18·00	Item R/11 Rs. 11·89 excludes Ridges, Valleys, Cutters and Windties.		Not available.				Rs. 13 as per item 11·16 excludes ridges, valleys Gutters Windties etc.		Our rate includes Ridges, Valleys, Windties etc.

1	2	3	4	5	6			7		8
						Zone I	*Zone II*			
35.	Protection with tarfelt.	M2	6·00	Mis/2 Rs. 8·43	Item Mis/3	12·00	12·00			
					5%	0·60	4% 0·48			
						11·40	11·52			
	IX. **Finishing Works**									
						Zone I	*Zone II*			
36.	Plastering of building surface on brick or concrete.	M2	3·50	Varies from 2·89 to 3·78 for various proportion for 1·5 Cm thick as per item XF/1 to XF/4.	Item XF/1 XF/4	3·20 to 5·00	3·40 to 4·00	Varies from	2·25 to 2·95	Our rate is a composite rate for all mixes and thicknesses.
					NF/4	With rebate as usual		Item 7·1		
						Zone I	*Zone II*			
37.	Lime or other painting.	M2	1·50	Varies from 71 NP to 1·00 as per item XF/20 to XF/27 with usual rebate.	Item XF/20	0·80 to 2·50	0·40 to 4·00	Varies from Rs.	0·30 to 2·15	
						Zone I	*Zone II*			
38.	Oil painting	M2	4·50	X/52 labour charges alone.	Item XF/32	3·50	6·72			
					5% rebate	0·18	0·27 (4%)			
						3·32	6·45			
39.	Glazing	M2	60·00	Not available.	Not available			Item 12·10—Rs.	4·50	
								Item 10·24—Rs.	60·00	The rate proposed is for 6 mm thick rough cast wired glass.

X. Insulation Works								
40. Two coats with hot bitumen for external walls, basement floors etc.	M²	2·75	Item XF/49—3·31	XF/54+ & XF/55 Rebate 5%	*Zone I* 6·00 0·30 4% 5·70	*Zone II* 5·00 0·20 4·80	Not available.	
41. Hydro Insulation with 2 layers of Tarfelt excluding protection.	M²	10·00	Items Mis/1—20·89 & Mis/3	Misc/1 & Misc/2 Rebate 5%	30·00 1·50 28·50	24·00 0·96 23·04	Not available	
XI. Radios and Railways								
42. Laying of Rly. Tracks of Standard gauge.	M	185·00	Not available	Not available			Item 16·2 Rs. 235·00	Our rate is as per SB Rly. rates in the areas.
43. Laying of Turnouts of standard gauge.	No.	15,000·00	Not available	Not available			Item 16·3 (a)—Rs. 18,500	
44. Ballasting of Rly. tracks and turnouts.	M³	40·60	Not available	Not available			—	—
45. Automobile Roads (9" Boulder soling, 6" Wearing Coat and 2" Premixed carpet).	M²	20·00	—	—			—	

1	2	3	4	5	6			7	8
46.	Paths and side walks.	M^2	7·85	—	—			—	
47.	Blind area On ready bedding.	M^2	2·85	—	—			—	
						Zone I	*Zone II*		
	XII. Outdoor Pipe Lines								
48.	Pipe lines of C.I. pipes of 100 mm dia.	M	19·00	Item P/4	4·23 for laying only	Not available		Item 14·1(b)	— 19·00
49.	Pipe lines of C.I. Pipes of 300 mm dia.	M	67·00	Item P/9	15·79 for laying only	Not available		Item 14·1(i)	— 67·00
50.	Pipe lines of C.I. pipes of 600 mm dia.	M	175·00	Item P/11	26·48 for laying only	Not available		Item 14·1(m)	— 175·00
51.	Pipe lines of C.I. pipes of 700 mm dia.	M	255·00	Item P/12	32·68 for laying only	Not available		Item 14·1(c) (rate for 750 m m)	— 235·00
52.	Water pipe line with steel fittings from 400 mm dia upto 600 mm and over.	Tonne	3,000·00	—				—	
53.	Manholes for water pipe line and sewerage.	No.	2,250·00			6·00	5·00	Item 13·2(b)	— 12·00
						10·00	11·50	Item 13·2(d)	— 27·00

54. Sewerage of coramic pipes of 150 mm dia.	M	15·20	Item P/49	4·50 for laying only	Item P 2 & P5					
						Zone I	*Zone II*			
55. Sewerage of coramic pipes of 300 mm dia	M	30·00	Item P/52	10·60 for laying only	For laying only as usual rebate.	12·00	2·23	Item 13·1(c)	—	28·00
56. Sewerage of concrete pipes of 300 mm dia.	M	30·00	Item/P/54	10·53	Item P 7	26·00	11·00	Item 13·1(h) (675 mm)	—	95·00
57. Sewerage of concrete pipes of 700 mm dia.	M	85·00	Item P/58	25·19	Item P 11			Item 13·1(m) 1200 mm dia.	—	250·00
58. Sewerage of concrete pipes of 1500 mm dia.	M	350·00	Labour charges only.		Labour charges only with usual rebates.					

APPENDIX V

(*Vide* Para 4 of Introduction)

Analysis of Action taken by Government on the recommendations contained in the 68th Report of the Committee on Public Undertakings

(*Fourth Lok Sabha*)

I.	Total number of Recommendations made	56
II.	Recommendations that have been accepted by Government (*vide* recommendations at Sl. Nos. 10, 11, 15, 21, 24, 27, 28, 29, 31, 32, 40, 41, 42, 43, 44, 45, 51, 53, 54, 55	20
	Percentage to total	36%
III.	Recommendations which the Committee do not desire to pursue in view of Government's reply (*vide* recommendations at Sl. Nos. 1, 2, 3, 4, 5, 6, 7, 8, 12, 14, 16, 17, 19, 20, 22, 23, 25, 26, 30, 33, 38, 46, 47, 50)	24
	Percentage to total	43%
IV.	Recommendations in respect of which replies of Government have not been accepted by the Committee (*vide* recommendations at Sl. Nos. 9, 13, 18, 34, 35, 36, 37, 39, 48, 49, 52, 56)	12
	Percentage to total	21%
	Recommendations in respect of which final replies of Government are still awaited	Nil

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