GOVERNMENT OF INDIA

TARIFF COMMISSION

REPORT ON

The prices of Locomotives and Boilers produced by Tata Locomotives and Engineering Co., Ltd.

BOMBAY, 1956

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GOVERNMENT OF INDIA

MINISTRY OF HEAVY INDUSTRIES

RESOLUTION

No. Eng. Ind. 17(17)/56.—By a Resolution No. Eng. 17(17)/55 dated the 10th October, 1955. the Government of India asked the Tariff Commission to make an enquiry into the prices of locomotives and boilers produced by M/s. Tata Locomotive & Engineering Co. Ltd., for supply to the Railway Board and to submit its recommendations regarding fair prices. The Commission submitted its report at the end of the September 1956. The main recommendations of the Commission are summarised below :—

(1) M/s. Tata Locomotive & Engineering Co. Ltd., should so maintain its costs as to be able to provide a break-down into about 40 groups of sub-assemblies. The costs of certain items selected should be separately recorded.

(2) Certain prices as recommended should be paid for the locomotives and spare boilers delivered by M/s. Tata Locomotive & Engineering Co. Ltd. during the first price period (1st July 1954 to 31st March 1955 for locomotives and 1st February 1954 to 31st March 1955 for boilers), the second price period (1st April, 1955 to 31st March, 1956) and the third price period (1st April, 1956 to 31st March, 1958).

(3) The prices recommended for the third price period may be adjusted from time to time to the extent that Government are satisfied that manufacturing costs have altered as a result of changes in railway freights, changes in statutory prices of coal and other fuel, raw materials, stores or machinery and changes in labour costs caused by labour legislation or adjudication or conciliation awards.

(4) A cost investigation should be made before prices are fixed for any price period in future.

2. The Commission has examined M/s. Tata Locomotive & Engineering Co.'s basic cost of production in relation to the corresponding cost of the Government-owned locomotives manufacturing unit at Chittaranjan and has then allowed for profit, managing agency commission and special depreciation as admissible under the Agreement entered into between the firm and the Railway Board.

3. Government accept the recommendations (2), (3) and (4) above and invite the attention of M/s. Tata Locomotive & Engineering Co. Ltd., to the recommendation (1).

4. The Commission has also made the following ancillary recommendations :—

(a) No further orders for spare boilers and no orders for locomotives of types other than YG and YP should be placed with M/s. Tata Locomotive & Engineering Co. Ltd., until the termination of the present agreement.

(b) There should be full exchange of information and consultation between the Railway Board and the Company and adjustments in the phasing of the Railway Board's requirements of locomotives should be made by mutual consent so as to secure maximum economy in production.

(c) In order to facilitate the preparation of drawings the Company should be informed of any modifications required in the original specifications without undue delay.

(d) The present level of inspection should be maintained.

(e) The system of payments adopted in the case of M/s. Tata Locomotive & Engineering Co. Ltd., should not be less favourable than that followed in the ease of foreign suppliers of locomotives and boilers.

(f) With a view to promoting closer collaboration in technical matters, M/s. Tata Locomotive & Engineering and Chittaranjan should arrange more frequent visits of their personnel to each other's works.

5. Government accept the recommendation (a) above in so far as it relates to deliveries up to 31-3-58, but for deliveries beyond that date the possibility of a modification in the types of stock required in changing circumstances must be taken into account. Accordingly steps will be taken to negotiate with M/s. Tata Locomotive & Engineering Co. Ltd. in the matter of prices for the period beyond 31-3-58, keeping in view any alterations in requirements that may arise. Recommendations (b), (c), (d), (e) and (f) are being further examined by Government and steps will be taken to give effect to them as far as possible.

6. Government trust that M/s. Tata Locomotive & Engineering Co. Ltd., will also take suitable action on the suggestions made in the Tariff Commission's Report regarding the scope for improvement in various matters such as the absorption of surplus labour, introduction of a less expensive incentive system of payment, and avoiding delays in expanding the project.

ORDER

ORDERED that a copy of Resolution be communicated to all concerned and that it be published in the *Gazette of India.*

Joint Secretary to the Government of India.

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CHAPTER I

INTRODUCTORY

Reference to the Commission

1.1. By an Agreement, dated 20th August, 1947, between the Railway Board and Tata Sons Ltd., the Tata Locomotive and Engineering Co., Ltd., (TELCO undertook the manufacture and sale of boilers and locomotives. The Agreement came into force for a period of 16 years from 1st June, 1945 and provided, *inter alia*, for a phased programme of manufacture and the manner in which the prices payable by the Railway Board for boilers and locomotives supplied by the Company should be determined. During the Development Period *i.e.* until the Company attained production at the annual rate of 100 boilers (including units fitted into locomotives) and 50 locomotives, the prices of locomotives and boilers were to be fixed at their actual costs of production but payment to the Company was to be limited to the average landed costs, the balance of the costs of production being held over in a Development Account. Upon completion of the development period, the Company was to receive fixed prices negotiated for price periods extending over one year or such longer periods as might be agreed upon. The Development Period for boilers ended on 31st January, 1954 and that or locomotives on 30th June, 1954, and since these dates, two 'Price Periods' endig 31st March, 1955 and 31st March, 1956 have elapsed. The Company submitted quotations for locomotives and boilers supplied during these two price periods. The Railway Board considered these prices excessive in comparison with the landed costs of locomotives and boilers imported from abroad. Telco, on the other hand, pleaded their inability to quote lower prices. As the matter required careful examination before a decision could be taken, Government decided, by the Ministry of Commerce and Industry Resolution No. Eng. Ind. 17(17)/55, dated 10th October, 1955 that the Tariff Commission should conduct an enquiry under Section 12(d) of the Tariff Commission Act, 1951 (L of 1951) and make recommendations as to:

(i) what should be the fair prices of locomotives and boilers manufactured by Telco since 1st February, 1954;

(ii) for what period the prices recommended should hold good; and

(iii) how the prices should be revised from time to time in future.

Subsequently, by telegram No. E. 17(17)/55, dated 28th August, 1956, the Government of India in the Ministry of Commerce and Industry confirmed the Commission's interpretation of item (i) obove that the fair prices to be determined should relate to locomotives and boilers delivered by Telco since 1st July, 1954 and 1st February, 1954 respectively. The Commission's interpretation is in accordance with clause 5 of the First Schedule to the Agreement.

1.2. In conducting the enquiry, the Tariff Commission was required to pay special attention to:

(a) the costing system in force at TELCO,

(b) the effect of subsidiary business like the manufacture of trucks, etc., on the progress and cost of manufacture of boilers and locomotives,

(c) the apportionment of idle of men and machines among the various accounts,

and also to examine, in particular, the steps required—

(i) to achieve the maximum economy in production, and to attain enhanced productivity and efficiency; and

(ii) to maximise the utilisation of indigenous material and capacity in the manufacturing processes,

in the locomotive industry in India. The Resolution has been reproduced in Appendix I.

Method of inquiry

2.1. On 9th May, 1956, the Railway Board and Telco were requested to forward to the Commission detailed memoranda on various points arising out of the inquiry. A special questionnaire was also issued to Telco on 17th May, 1956. Telco submitted their memorandum on 25th May, 1956 and the Railway Board on 10th June, 1956. Additional information as required by the Commission's special questionnaire was submitted by Telco on 11th June, 1956 and 6th July, 1956 and their comments on the Railway Board's memorandum were received on 28th July, 1956.

2.2. Mr. D. W Hadfield, General Manager, Robert Stephenson and Hawthorns Ltd., Darlington, England was appointed as Technical Adviser to assist the Commission in its inquiry. He served in this capacity from 13th June, 1956 to 9th August, 1956 and submitted a Report.

2.3. Shri K. R. Damle, Chairman, Shri B. N. Adarkar, Shri C. Ramasubban and Dr. S. K. Muranjan, Members and Shri S. K. Bose, Secretary, visited the Telco Works at Jamshedpur on 13th and 14th July, 1956 and the Chittaranjan Locomotive Works on 16th July, 1956. Mr. Hadfield visited these factories during the months of June and July, 1956 and held discussions with the representatives of Telco and Chittaranjan. He met the officers of the Railway Board at New Delhi on 18th July, 1956.

2.4. Shri N. Krishnan, Senior Cost Accounts Officer, Shri A. K. Gopalan and Shri P. M. Menon, Assistant Cost Accounts Officers visited the Telco Works in June and July, 1956 for cost investigation. They visited Chittaranjan Locomotive Works for a comparative study of costs and the costing system and submitted a Report.

2.5. The Commission held discussions with the representatives of the Railway Board and Telco from 2nd to 4th August, 1956 at Bombay. A list of the representatives who took part in that discussions is given in Appendix II.

Brief history of locomotive manufacture in India

3.1. Though the Locomotive industry in India is today one of the youngest in the field of heavy enginering, its origin may be traced back to the activities of the Railway workshops at Jamalpur and Ajmer which were established during the eighties of the last century. The Jamalpur workshop built 214 locomotives, 103 boilers and 99 tenders during the period 1885 to 1926 and the workshop at Ajmer built 435 locomotives between the years 1896 to 1940. In September, 1921 the Government of India announced their intention to take active steps to implement their policy of making India self-sufficient in the supply of materials for railways. In the communique issued by them at the time, they notified that the question of the construction of locomotives in India was being considered and gave a general undertaking that tenders would be invited annually in India for the locomotives and boilers required by them during the next twelve years. Encouraged by the prospects contained in the communique, the Peninsular Locomotive Co. Ltd. was incorporated in India on 6th December, 1921. The Company started constructing a factory on a site leased by the Tata Iron and Steel Co. Ltd., at Jamshedpur. In 1924, its application for protection was considered by the Tariff Board which reported that it was desirable on national grounds that the industry should be established in India, and what this could eventually be done provided substantial assistance was given by Government in the earlier years, but the existence of a sufficient market for locomotives in India was an indispensable preliminary condition and this condition was not then satisfied. Shortly afterwards the Company went out of business. The unfinished factory of the Company was purchased by Government and converted into shops for the construction of railway carriages and wagon underframes and came to be generally known as the Singhbhum shops of the East India Railway.

3.2. In 1940 a Departmental Committee, consisting of Mr. J. Humphries and Mr. K. C. Srinivasan of the Railway Board, investigated into the prospects of manufacture of steam locomotives in India and came to the conclusion that as there was a steady and adequate demand for them, a factory should be set up for manufacturing locomotives. The recommendations of this Committee could not be implemented till the end of the war.

3.3. During the period of World War II, the activities of many of the Railway Workshops were diverted to the manufacture of munitions. Owing to the stoppage of imports there accumulated heavy arrears of renewals and replacements in locomotives and boilers. In these circumstances Messrs. Tata Sons Ltd., made an offer to manufacture locomotive boilers in the Singhbhum Shops as a preclude to reconstructing the factory for the manufacture of locomotives on the termination of the war. The Government of India welcomed this offer and concluded an agreement in 1945 with Tata Sons Ltd., for the manufacture and supply of locomotives over a period of 16 years. Under the provisions of the agreement, Tata Sons Ltd., promoted a new Company, the Tata Locomotive and Engineering Co. Ltd., with the object of acquiring the Singhbhum Workshops for the manufacture and sale of locomotives and locomotive boilers. The new Company was registered on 1st September, 1945 with an authorised capital of Rs. 7 crores, of which Rs. 2 crores, in ordinary shares, was issued in

the first instance. Telco's locomotive works came into production in December, 1951 and the first locomotive was manufactured in January, 1952.

3.4. By the end of the war, it became clear to the Government of India that the requirements of locomotives and boilers for Indian Railways would be beyond the capacity of one manufacturing unit. Government, therefore, decided to set up a new factory for the construction ef locomotives at Chittaranjan at an estimated cost of Rs. 15 crores. Chittaranjan entered into an agreement with the Locomotive Manufacturers' Association, U. K. for technical co-operation. This technical assistance, together with the services of eight technicians from U. K. which Chittaranjan secured under the Colombo Plan, helped the factory considerably in the early stages of its development. The erection of the factory started in 1948 and Chittaranjan came into operation in January, 1950. It turned out its first locomotive in November, 1950.

3.5. The following statement shows the number of locomotives and spare boilers delivered by Telco and the number of locomotives delivered by Chittaranjan up to the end of 1955-56.

	Telco	Chittaranjan	
	Spare boilers	Locomotives YG/YP	Locomotives W. G.
1949-50	23	..	..
1950-51	19	..	7
1951-52	37	4	16
1952-53	20	26	27
1953-54	32	25	62
1954-55	42	45	89
1955-56	42	42	135

Prices quoted by Telco

4.1. In May, 1955, Telco quoted the following prices inclusive of profit for the two post-developmental price periods ending 31st March, 1955 and 31st March, 1956. Since the Railway Board consider these prices to be excessive in comparison with the

landed costs, the corresponding landed costs, as given in the Railway Board's Memorandum and the ratio of the prices quoted to the landed costs have also been shown in the following statement.

Type of Boiler/Locomotive	Price quoted per unit	Landed cost per unit	Ratio of price quoted to landed cost
	Rs.	Rs.	per cent.
1st Price Period—			
12 XC boilers	3,62,973	1,35,000	268.87
53 YD boilers	2,05,372	82,300	249.54
43 YP locos	6,54,544	3,52,000	185.95
2nd Price Period—			
41 YP locos	5,88,329	3,52,000	167.14
9 YG locos	5,81,466	3,50,000	166.13
12 YP boilers	1,67,152	1,17,300	142.50
6 YG boilers	1,66,896	1,16,700	143.01
11 YF boilers	1,14,806	62,700	183.10
11 XE boilers	2,63,689	1,42,800	184.66

4.2. The Railway Board have also furnished a comparative statement showing the cost of production of locomotives at Chittaranjan and Telco during 1954-55. The statement is reproduced below:

	Chittaranjan	Telco (*)	
	Cost of WG loco in 1954-55 Weight 123.5 tons	Cost of YP loco in 1954-55 ; Weight 68 tons	
		1st order	2nd order
	Rs.	Rs.	Rs.
Direct labour	14,000	16,923	15,420
Direct bonus		19,158	18,230
Overheads	1,97,000	2,81,793	2,97,542
Direct materials	3,35,000	2,19,003	1,96,947
Total Cost	5,46,000	5,36,877	5,28,139
Landed cost	5,35,000	3,52,000	3,52,000
Percentage to landed cost	102.0	152.52	150.04

(*) The figures are exclusive of profit but inclusive of the managing agency commission.

4.3. The prices quoted by the Company are subject to two qualifications: They include only the average depreciation obtained by spreading the estimated total depreciation admissible under the Income Tax Law (by way of normal depreciation, additional normal depreciation, initial depreciation and devlopment rebate over a period seven years from 1954-55 to the end of the Agreement, *i.e.* May, 1961. If the full depreciation pertaining to 1954-55 and 1955-56 had been included, the quotations would have been much higher. Secondly, the prices for the second price period ending 31st March, 1956 were quoted in May, 1955 and were, therefore, based on estimates. They are subject to adjustments in the light of the actuals now available.

4.4. We propose to examine the costs of production of locomotives and boilers at Telco in relation to both (a) the costs at Chittaranjan and (b) the landed costs. Before doing so, however, it is necessary to describe the main features of the Agreement between the Railway Board and Telco, since the provisions of that Agreement have a material bearing on several elements in Telco's costs of production.

CHAPTER II

Main Features of the Agreement between the Railway Board and Telco.

5.1. The Agreement between the Railway Board and Telco which was formally signed on 20th August, 1947, came into effect from 1st June, 1945, the date on which Telco was given possession of the Singhbhum Shops, and it is to continue for a period of 16 years *i.e.*, up to 31st May, 1961. Under the Agreement, the Company was to plan the production of boilers as under:—

Period A—the first year : a minimum of 50 units

Period B—the second year : to increase the rate of production further

Period C—the third and successive years : 100 units per year (including units fitted into locomotives)

The Company was to submit within 18 months a complete scheme for the manufacture of 50 locomotives per year, and to plan the production of locomotives as under:

Period—X	.	The first two years from the date of receipt of plant and machinery at the works :—	Such number of locomotives as may be fixed by mutual agreement.
Period—Y	.	The third and successive years :—	50 locomotives per year.

Production was to be planned by mutual consent. It was agreed that Government should indicate in advance its requirements of locomotives and boilers by types and designs and that the types and designs to be undertaken by the Company should be as few as possible consistently with the total requirements of Government.

5.2. Government agreed to purchase the Company's entire output of locomotives and boilers under the manufacturing programme indicated above. If the Company offered any additional production of locomotives and boilers, Government agreed to accept the offer in preference to imports. The Company is not to be liable for any short delivery to the extent of 10 per cent. of the guaranteed quantities of for any short deliveries which are made good within a grace period of one month. Subject to these conditions, Government is entitled at its option to buy the entire quanity short delivered on account and at the risk of the Company or to recover liquidated damages at the rate of Rs. 3,000 for every boiler and Rs. 7,500 for every locomotive short delivered. This option has to be exercised by notice in writing within three months of the expiry of the grace period. The Agreement also includes a "force majeure" clause.

5.3. The prices to be paid by Government for locomotives and boilers are to be calculated as under :—

(i) For all boilers to be delivered in periods A and B and for the "first lot" of locomotives (the number to be determined by mutual consent) :—

The actual cost of production calculated in the manner laid down in the Agreement.

Provided that in the first instance the amount to be paid by Government was not to exceed the average landed cost at an Indian port of similar locomotives and boilers imported from the United Kingdom within the period. The balance of the cost was to be carried to separate accounts to be known as the "Locomotive Development Account" and the "Boiler Development Account", and the total amounts shown in these accounts were to be transferred by eight equal annual instalments to and charged in the costs of production of locomotives and boilers sold to Government in periods Y and C respectively, subject to Government's option to repay the amounts earlier in one more instalments.

(ii) During Period C for boilers and Period Y for locomotives, the price is to be made up of:

(a) the estimated production cost to be arrived at on the basis of the then latest actuals of similar types of locomotives and boilers, making due allowance for any difference in rates of production and any other factor which may reasonably be considered to influence the production cost, *plus*

(b) profit at 7 per cent. f the estimated capital employed computed in accordance with the formula laid down in the Agreement.

The prices are to be negotiated sufficiently in advance of each price period. The price period is one year or such longer period as may be agreed upon.

5.4. The First Schedule to the Agreement and Annexure I and II to that Schedule lay down the manner in which production costs and capital employed should be determined. It is unnecessary here to summarise the provisions of the Schedule or of its Annexures and refernce will be made to the relevant provisions as and when necessary later in the Report. It is sufficient at this stage to draw attention to two important decisions embodied in these Annexures and related documents, which have a bearing on the costs and prices of locomotives and boilers. The first of these relates to depreciation. By its letter No. SL/LM dated 14th November, 1947, the Railway Board agreed that any special or additional depreciation or other allowance or rebate allowed at any time during the pendency of the Agreement for tax purposes should be treated as part of the cost of production of boilers and locomotives under the Agreement. Further, by Clause VIII of the Supplement to Annexures I and II, it was agreed that in arriving at the written down value of the assets for the purpose of allocation of the capital employed, no deduction should be made of the initial depreciation thereon but that the value of the assets should be written down to nil in the year in which no further allowance for depreciation will be made by the Income Tax authorities. The second decision relates to the allocation of overheads between the loco work and the non-loco work carried out in the loco shop. In the past, the capacity of the loco shop was partially utilised for the manufacture of underframes, road rollers, etc. Normally, the total overheads including the idle time of men and machines should be distributed over all the jobs undertaken in the loco shops, but on the consideration that the occurrence of idle time could be regarded as incidental to the development of the main project the Railway Board agreed to a

method of allocation which had the effect of relieving the non-loco jobs of their share of idle time and debiting it to the locomotive/ boiler account.

6.1. Telco was not able to implement the production programme as laid down in the Agreement and has explained this as due to the various difficulties which arose after it took over the Singhbhum shops. In the case of boilers, although the Company was expected to produce at least 50 boilers by June, 1946, there was a delay of 16 months in the receipt of plant and equipment and over 2½ years in the receipt of certain essential components, with the result that the first boiler was made only in May, 1947. The delays were due to the abnormal conditions of the postwar period. By the middle of 1948, the process of dismantling the Singhbhum shops and of constructing on the same site the new locomotive shops had advanced to a stage at which systematic and uninterrupted production work was no longer possible. It was not until the completion of the new factory at the end of 1951 that regular production of boilers could be resumed. In April, 1947, Government decided that Period C should be deemed to commence from 1st January, 1949, but this decision was rescinded in December, 1951 when it was agreed that Period C for boilers would commence when the Company had produced 8 boilers per month for two successive months and satisfied the Railway Board that the level of production would be maintained at 100 boilers per year. The required output was attained by the Company in February and March, 1954 and, after an investigation by a technical team of the Railway Board, Government confirmed that 1st February, 1954 should be treated as the date on which Period C for boilers had commenced.

6.2. The implementation of the locomotive programme was also delayed. Although a project report for the manufacture of locomotives was submitted by the Company and approved by Government in May, 1947, the new locomotive shops were not ready for assembly-*cum*-manufacture until the end of 1951 and the first locomotive was produced only in January, 1952. The Company has attributed this delay to several factors. The majority of the old Singhbhum shops had to be completely demolished and the new shops erected on the same site and this proved to be a very intricate, expensive and time-consuming process. Difficulties were also experienced in regard to the receipt of steel materials, the availability of fabricating capacity and of necessary trained personnel and deliveries of plant and machinery. Moreover, owing to the slump in the investment market after the Budget of 1947, the Company was unable to raise the requisite finance to complete the project and the Government of India had to come to its aid by investing Rs. 2 crore in its Preference Shares. The Company's negotiations with successive foreign manufacturers of locomotives for the necessary technical aid, which were started as early as January, 1946, produced no results until July, 1950 when the Company was able to conclude a technical aid agreement with Messrs. Krauss-Maffei, A.G., of West Germany. Once the factory was completed, however, the Company made rapid progress and completed the first order for 50 YG locomotives in November, 1953 *i.e.* in less than two years.

6.3. The agreement had not stirpulated the duration of Period X for locomotives, but had only provided that "the first lot of locomotives" i.e. the number to be produced during Period X should be

fixed by mutual agreement. In December, 1951, however, it was decided that the number which should constitute "the first lot of locomotives" should be determined with reference to the progress made in the indigenous manufacture of locomotives at Telco and that the number should be so fixed that by the time manufacture of that number was completed, at least 75 per cent. of the total indigenous production (excluding castings, instruments and patented and proprietory items forming part of the locomotives) would have been established at Telco. This requirements was fulfilled in July, 1954, 2½ years after the completion of the locomotive shops and after an investigation by a technical team of the Railway Board, Government confirmed that Period Y for locomotives had commenced from 1st July, 1954.

6.4. Reference has been made above to the Locomotive and Boiler Development Accounts to which was transferred the excess of the actual costs of production of the units delivered by the Company over the payments made by Government during the Development Periods (*i.e.*, Periods A and B for boilers and Period X for locomotives). The total amount outstanding in these Accounts at the expiry of the Development Periods, as stated by the Railway Board, was Rs. 2·30 crores. The Company proposed to utilise this amount in the construction of a steel foundry and Government, therefore, decided to exercise its option under the Agreement and paid off the amount in four instalments. Consequently, the Development Accounts are now closed.

6.5. The foregoing account of the working of the Agreement has been given only to provide the background of this issue. Since our examination is limited to the price periods, we have not considered it necessary to decide whether the delays on the part of the Company in implementing its manufacturing programme were justified.

CHAPTER III

COSTS AT TELCO AND CHITTARANJAN

Adjustments needed to obtain comparable costs

7.1. We propose to examine Telco's costs in comparison with Chittaranjan in the first instance, because we consider that Chittaranjan's performance offers a fair standard of comparison. Despite certain basic differences, there is likely to be a greater similarly in working conditions between Chittaranjan and Telco than between an Indian and a foreign unit. Both Chittaranjan and Telco are modern locomotive works established since the war and employing Indian labour. Due allowance must, however, be made for differences in their constitution, the costing principles and procedure followed by them and the nature of their products before a valid comparison can be made of their respective costs.

7.2. As Chittaranjan is a Government undertaking while Telco is a Company-owned unit, profit and interest are treated differently in the two organisations and our comparison has, therefore, to be confined to their basic costs exclusive of these two elements. Secondly, Chittaranjan's costs include depreciation on strainght line basis at 5 per cent. and 2 per cent. of the original value of (a) plant and equipment and (b) buildings, respectively, whereas Telco has been allowed, under its Agreement with Government, to charge the entire amount of depreciation and development rebate admissible under the Income Tax law. It is, therefore, necessary to adjust the depreciation included in Telco's costs to Chittaranjan basis in order to make it comparable with Chittaranjan. Thirdly, unlike Chittaranjan, Telco has no iron foundry at present and hence the cost of iron castings which is wholly included under the heading of materials in Telco's costs, is divided between materials, direct wages and overheads in Chittaranjan's costs. The latter have, therefore, to be adjusted by transferring the direct wages and overheads incurred for iron castings to the heading of materials. Fourthly, by virtue of its being a Government undertaking, Chittaranjan has enjoyed certain advantages in the shape of concessional railway freight and services of certain Colombo Plan experts without payment of salaries for which due allowance must be made in its cost. The allowance is estimated at Rs. 1,600 per locomotive for 1955-56 (Rs. 600 for the freight concession and Rs. 1,000 for the services of the Colombo Plan experts).

Differences in costing procedures

7.3. There are also certain fundamental differences between the costing procedure followed at the two units. Telco men are all daily paid, whereas at Chittaranjan all workers are on monthly pay and the hourly rate for the purpose of booking time on job cards is the monthly rate divided by 208. The difference between this figure of 208 and the potential number of working hours in each month is adjusted through the overhead charges. At Telco, dearness allowance is included in overhead charges, but at Chittaranjan, it is included in direct wages which seems to be the more correct procedure. Another important difference is that whereas Telco accounts

can at all stages show man-hours corresponding to wages, Chittaranjan accounts do not record man-hours at any stage after the payment of wages and piece-work bonuses has been made. Thus, Telco's unit cost figures show both the direct wages and the corresponding direct man-hours per locomotive, but in Chittaranjan's figures, only the direct wages per locomotive are shown. This causes difficulty in comparing the performance of the two units as the difference in their wage structure is so great that the only reliable basis of comparison is the man-hours per unit. In the absence of recorded data, our Technical Adviser and Senior Cost Accounts Officer have had to estimate the man-hours per locomotive produced at Chittaranjan by multiplying the total direct wage cost per locomotive by the average hours per rupee for the works as a whole. To the figure of man-hours per locomotive so obtained an addition has had to be made, in order to make the figure comparable with Telco, for the average number of man-hours per locomotive which were saved as a result of Chittaranjan using a certain number of imported components to supplement its production. The average man-hours so saved worked out to 4447 per locomotive during July, 1954 to March, 1955 and 4,000 during April to Sptember, 1955. This adjustment in the number of man-hours per locomotive involves corresponding adjustments in other elements of cost. The next important difference between the costing systems of the two works is that whereas Chittaranjan obtains the finished cost including materials, wages and overheads for every component part of the locomotive, Telco records only the complete costs for each batch of locomotives or boilers, with separate costs for only a few groups of components. In this connection, our Technical Adviser has observed as follows: "The recording of individual component costs serves no useful purpose unless they are to be used later to quote to Railways for the supply of spare parts. The costs of individual components do not serve as a suitable means of control over the costs of the completed locomotive, as this would involve the scrutiny of cost of some four thousand or more individual parts. The Telco system, on the other hand, does not provide any easy means of control over prices during the progress of the contract, although it is true that the Works Management are able to check a monthly statement of all individual jobs done on piece-work, showing whether or not these wer done within the time allowed. The ideal method would be to break up the locomotive into about 40 groups of sub-assemblies and to collect the costs for each batch of locomotives under these groups. This provides an overall check which can be conveniently summarised on one sheet of paper". We agree with the Technical Adviser.

Adjusted unit cost

8.1. Taking into account the aforesaid differences between the costing principles and procedure followed at the two Works, we have tried to build up the basic costs per locomotive at Telco and Chittaranjan as a comparable basis. Profit, interest and Managing Agency commission have been excluded from Telco's figures. We have utilised the data collected by our Senior Cost Accounts Officer regarding the actual cost of production at the two works instead of the estimates of costs on which the prices quoted by Telco (*vide* para. 4·1 above) were based. For purpose of the present analysis of the cost disparity between Telco and Chittaranjan, we propose to use the following figures of adjusted costs of production at the two works.

*Adjusted costs of production per Locomotive** (1955-56)

	Telco YP II		Chittaranjan W. G.	
	Rs.	Rs.	Rs.	Rs.
Direct labour	..	35,236	..	19,903
Overheads :				
(a) Normal Depn. . . .	57,743	..	36,039	..
(b) Spl. Depn. . . .	63,551	..	..	..
(c) Other overheads . .	1,54,653	2,75,947	1,32,383	1,69,322
Materials . .	..	1,96,513	..	3,16,648
Total . .		5,07,696	..	5,05,873
Less total depn.		1,21,294	..	..
		3,86,402	..	..
Add depn. on Chittaranjan basis .		39,761		
		4,26,163		
Add expenditure on Colombo Plan staff etc.	..	..	..	1,600
TOTAL . .	..	4,26,163	..	5,07,473

*The figures given above are slightly different from those in the Technical Adviser' Report, because of certain adjustments made after the latter Report was finalised

Relation between WG and YP locomotives and 'target' cost

8.2. It is important to note that Chittaranjan's costs relate to broad gauge heavy goods locomotives, WG type, with 2—8—2 wheel arrangement and an empty weight of 123·5 tons for engine and tender, whereas Telco's costs relate to metre gauge locomotives, YP type, with 4—6—2 wheel arrangement, weighing empty 68 tons. In view of this difference, Chittaranjan's cost cannot be used directly to measure Telco's performance, and we have, therefore, to estimate on the basis of Chittaranjan's cost per WG locomotive, what the corresponding cost of a GP locomotive would be under identical conditions. For this purpose, the Railway Board have suggested a formula according to which the ratio between the YP and WG locomotives works out to 67·5 per cent. This, however, is very wide of the actual percentage established in an experienced British Works. Moreover, the formula does not take due account of factors other than the surface area of the components and the empty weigh of the locomotive. By this formula, a most expensive 4—6—2 type metre gauge tank engine weighing 42 tons empty would be estimated to cost the same as a very simple 0—6—0 broad gauge engine of the same weight, although the latter has only half the number of wheels, axles, axle boxes and springs, with no bogie or trailing truck. Our Technical Adviser has suggested another method for estimating the cost of YP locomotive under Chittaranjan conditions which we regard as more realistic. Figures obtained by him from a well-known British firm which has built a considerable number of both types show that the total amount of work in a YP locomotive is 81 per cent. of the work involved in building a WG locomotive. The direct wage cost per YP locomotive under Chittaranjan conditions may, therefore, be taken

at 81 per cent. of Chittaranjan's corresponding cost per WG locomotive. The ratio of overhead charges for a YP locomotive to those for a WG locomotive has been estimated by our Technical Adviser at 90 per cent. having regard to the fact that certain items of overheads will be the same for both metre gauge and broad gauge engines, namely, depreciation on some of the more expensive special purpose machines, provision of blocks, tools, dies, jigs and fixtures; staff salaries for planning, material procurement, progressing and inspection. As regards materials, the cost per ton for a YP locomotive is normally somewhat more than that for a WG locomotive, because the reduction in the cost of many of the proprietory fittings (like electric head light equipment, brake equipment, roller barings etc.) for a YP locomotive is not proportional to the reduced weight of this engine. After a careful examination of the data in consultation with our Technical Adviser, we are satisfied that the cost of materials per ton of YP locomotives produced by Telco is reasonable in comparison with the corresponding figure for Chittaranjan's WG locomotives. Thus, according to the method suggested by our Technical Adviser, the cost of a YP locomotive under Chittaranjan conditions may be estimated by taking the direct wages cost and overheads at 81 per cent. and 90 per cent. respectively of the corresponding costs of a WG locomotive produced at Chittaranjan and the material cost as equal to that actually incurred at Telco. We consider that the cost of a YP locomotive so estimated, which may be called the 'target cost' affords a fair basis for measuring the extent to which Telco's costs are excessive. The following table gives (a) Chittaranjan cost per WG locomotive, (b) the target cost per YP locomotive estimated in the manner indicated above, (c) Telco's cost per YP locomotive and the excess of (c) over (b).

Unit Cost per locomotive (1955-56)

	Chittaranjan 'adjusted' cost per 'WG'	'YP' target figure based on 'WG'	Telco 'adjusted' cost per 'YP'	Excess of (c) over (b)
	(a)	(b)	(c)	(d)
	Rs.	Rs.	Rs.	Rs.
Direct labour	19,903	16,121	35,236	19,115
Overheads	1,70,922*	1,53,830	1,94,414†	40,584
Materials	3,16,648	1,96,513	1,96,513	..
TOTAL . . .	5,07,473	3,66,464	4,26,163	59,699

*Inclusive of Rs. 1,600 for expenditure on Colombo Plan staff etc.

†This is made up of overheads Rs. 1,54,653 and depreciation on Chittaranjan basis Rs. 39,761.

9.1. It will be seen that two-thirds of the excess of Telco's cost over the target figure is accounted for by overheads, and the balance by direct wages. The heavy overhead charges may be traced partly to Telco's high capital cost per unit of capacity and partly to low output owing to the manner in which the capacity is utilised. Although the guaranteed output under the Agreement with the Railway Board was only 50 locomotives and 50 spare boilers, Telco's plant was originally planned, with the concurrence of the Railway Board, to produce 100 locomotives. This was certainly the right course, since any locomotive plant has to provide many special purpose and auxiliary machines which cannot be fully utilised for a lower output. Subsequently, however, when the plant went into operation in 1952, it became evident that the actual caapcity of the plant was far short of that estimated by the Company's Consulting Engineers and that further capital expenditure was required to increase the capacity to 100 locomotives. The Company has admitted that in relation to its present capacity, its capital outlay is high and this, therefore, is one of the basic causes of its heavy overhead charges. Telco also claims to have purchased its equipment at a later date as compared with Chittaranjan and had consequently to pay enhanced prices. The present investment in Telco (locomotive division) is Rs. 481·10 lakhs (excluding colony) whereas the corresponding figure for Chittaranjan is Rs. 798·51 lakhs (also excluding colony). The expenditure on colony has to be excluded for the purpose of this comparison,, since Telco has only to provide housing for about 50 per cent. of its staff, while Chittaranjan's colony houses all its employees. If the capital investment is related to a capacity of 50 locomotives and 50 spare boilers, equivalent to 67 locomotives, in the case of Telco and to a capacity of 120 locomotives in the case of Chittaranjan, the investment per locomotive works out to Rs. 7·18 lakhs for Telco and Rs. 6·57 lakhs for Chittaranjan. The present equipement at Telco, however, would even now be sufficient for an annual outturn of 70 locomotives plus 30 spare boilers equivalent to a total outturn of 80 locomotives, (*Vide* para 11.1 below), if certain production difficulties could be removed. Chittaranjan has already attained, with the use of some 'balancing components', an output of 150 locomotives per year. Even on the basis of these higher figures of capacity, the capital investment per locomotive comes to Rs. 6:01 lakhs in the case of Telco and Rs. 5:32 lakhs in the case of Chittaranjan. Thus, in the case of Telco, considering the heavy capital investment in its plant, even a volume of 80 locomotives—and a fortiori, the present volume—is not sufficient for economic production. Telco is well aware of this and has decided to spend an additional Rs. 77 lakhs (Rs. 52·66 lakhs on machinery and Rs. 24.24 lakhs on buildings) to increase its capacity to 100 locomotives per year. When this expansion is completed, Telco's capital investment per locomotive will amount to Rs. 5·58 lakhs which will compare reasonably with Chittaranjan's figure of Rs. 5·32 lakhs. Since the erecting shop and the boiler shop space at Telco have been provided on a fairly adequate scale, Telco could step up its output to more than 120 locomotives per year if its machine shop production were allowed to be supplemented by imported components. In that case, its capital investment per locomotive would work out to an even lower figure. Thus, the lack of balance in Telco's present capacity is an important cause of its heavy overhead charges and it follows, therefore, that expansion of its capacity to 100 locomotives per year

High capital cost of Telco per unit of capacity

will go a long way towards removing this handicap. (Chittaranjan's investment on colony is higher at Rs. 4·18 lakhs per locomotive on an output of 150 locomotives, as compared with the investment of Rs. 1·08 lakhs per locomotive in Telco's colony on an output of 100 locomotives, including the projected additional outlay of Rs. 7·14 lakhs, but Chittaranjan's disadvantage in this respect is to some extent offset by its lower wages cost.) In the above comparison of capital cost per locomotive, no allowance has been made for the difference in the types of locomotives produced at the two works, because although Telco has been producing only metre gauge locomotives, its plant has in fact been laid out for broad gauge as well as metre gauge locomotives.

Delay in expanding Telco's capacity and output

9.2. We have tried to examine whether the steps now contemplated to expand Telco's capacity to 100 locomotives per year should not have been taken earlier. On this point, the Company has explained its position as follows. From the beginning, the Company was aware that a capacity for 100 locomotives was necessary for economic production and the plant was originally planned for this capacity. It has only in January, 1952, however, when the plant actually went into production that the Company discovered that its consultants had been too optimistic with regard to the efficiency of Indian workers and had also under-estimated the requirements of machinery and covered area, and that the actual capacity was consequently less than 100 locomotives. At this stage, the Company could have taken steps to rectify the deficiencies in its plant, but it did not do so, because earlier, at a meeting held in December, 1951, the Railway Board had expressed its inability to increase its guaranteed purchases above the figures laid down in the Agreement. Indeed, under Clause 11 of the Agreement, Government was committed to accept any additional capacity offered by the Company in preference to imports, but this Clause could operate only if and when Government had need for additional units and did not, therefore, amount to a guarantee of purchase. In view of the uncertainty created by Government's refusal to increase the guaranteed purchases, the Company did not consider it prudent to expand its locomotive capacity and had instead to look for other projects. In December, 1953, however, the Railway Board asked the Company to plan for increased production of locomotives, but by that time the Company had already taken up other projects, particularly the steel foundry which in any case was a necessary adjunct to the locomotive factory. The Company, therefore, asked for more time to comply with the Railway Board's suggestion and put up the necessary proposals for expansion of capacity only in 1955. The Company has thus ascribed the delay in the expansion of its capacity to the fact that the Railway Board's readiness to increase its purchases of locomotives above the guaranteed quantities became evident only as late as December, 1953 when the Company had already taken in hand other projects. The Company has now ordered the necessary balancing equipment and the additional capacity is expected to come into production by April, 1958.

9.3. The Railway Board, on the other hand, has pointed out that whereas from the beginning Telco claimed the capacity of its factory to be 100 locomotives, it was only in 1955 that it informed Government for the first time that an additional capital expenditure of Rs. 84 lakhs was required to attain this capacity. Till then Government took

the capacity of the Company to be no less than 100 locomotives. Acting on this belief, Government requested the Company on several occasions from 1953 to 1955 to take the necessary steps to increase its output to the original targets of 100 locomotives, but the Company pleaded that it could plan for a substantial increase in its output of locomotives only after its steel foundry and production of diesel trucks had been established. The Railway Board has, therefore, argued that owing to its preoccupation with the steel foundry and the diesel truck projects, the Company not only failed to increase its output to its full capacity, but took no steps, until as late as 1955, to augment its capacity to the original target figures; nor did it inform Government until 1955 that additional capital expenditure was required for this purpose. This failure on the part of the Company has resulted in the Railway Board being asked to pay heavy capital charges on the locomotives and boilers purchased by it. As regards the Company's contention that it was because of the Railway Board's refusal in December, 1951 to increase its guaranteed purchases that the Company had to take up other projects in preference to expansion of its locomotive capacity, the Railway Board has pointed out that since Government has been importing YP/YG locomotives for years, there was no ground at all for any apprehension on the part of the Company with regard to its ability to sell additional YP/YG locomotives to Government under Clause 11 of the Agreement and that the Company should also have known that an increase in capacity was absolutely necessary to reduce its cost of production. To illustrate the Railway Board's willingness to place larger orders with Telco, it has been pointed out that in 1955 when Telco for the first time expressed its readiness to increase its output from 50 to 70 locomotives before 1957, if the Railway Board stepped up its orders, the suggestion was agreed to within six months.

9.4. After a careful examination of the case of both parties, we have come to the conclusion that while the necessary steps to augment Telco's capacity to 100 locomotives should have been taken much earlier, Railway Board cannot altogether be absolved of its share of responsibility for this failure. For a correct appraisal of the position, we should consider separately the period prior to 1953 and that from 1953 onwards. It was only in 1953 that the Railway Board asked the Company to increase its output above the guaranteed quantities, but till then the Company could not be blamed for taking notice of the fact that the guaranteed purchases in Period Y were no more than 50 locomotives and that in December 1951 Government had refused to extend their guarantees beyond these figures. Surely, the fact that a volume of 100 locomotives was necessary for economic production was well-known to the Railway Board as well as to the Company, the fact that the Company's plant was laid out for 100 locomotives was also known to the Railway Board; and if the Company could be expected to foresee that Government's requirements for YP/YG locomotives would be much larger than 50 per year, so could the Railway Board. Under these circumstances, it is not at all clear to us why the Railway Board should have insisted on maintaining the guaranteed purchases under the Agreement at only 50 locomotives per year. If this was done for the sake of caution, we cannot blame the Company for exercising similar caution in expanding its capacity. From 1953 onwards, however, there was no ground for the Company to feel any uncertainty about its ability to sell additional locomotives and the delay on its

part from that point to 1955 in carrying out the Railway Board's suggestion was on the plea that it had already committed itself to other projects. We do not think that the Company was justified in postponing the expansion of its locomotive capacity on this ground, but at the same time we do not think that by doing so, the Company can be said to have committed a breach of its Agreement with Government. We feel that the Railway Board should have taken care to stipulate such quantities in the Agreement as would make economic production possible. In any case, this question of increasing the capacity and output should not have been allowed to drag on from 1953 to 1955. In March, 1955, the Railway Board finally decided that an annual order for 100 locomotives would be placed on Telco for five years from 1956-57, and the expansion scheme was sanctioned by Telco's Board of Directors five months later.

9.5. For the above reasons, we consider that although Telco's capital cost is admittedly high in relation to its capacity, and steps should have been taken earlier to increase the capacity, it would not be fair to make any adjustment in its cost on this account.

Surplus capacity in machine shop

10.1. As stated earlier, another possible cause of the heavy overhead charges in the case of Telco is the manner in which the existing capacity is utilised. In this connection, we have to examine whether a portion of the caapcity is lying idle, or whether, while the capacity is fully or almost fully employed, the output is below normal for other reasons. In their Memorandum to the Commission, the Railway Board contended that Telco's heavy overhead charges were largely due to the first of these causes, namely, a high proportion of surplus capacity. To illustrate this, the Railway Board pointed out that as much as 55·54 per cent. and 35·84 per cent. of Telco's potential machine capacity was lying idle in 1953-54 and 1954-55 respectively. These figures would give rise to the impression that Telco could expand its output appreciably above the present level even with its existing capacity and under existing conditions. It is necessary to remember, however, that any locomotive plant has got to provide several key machines and auxiliary equipment the capacity of which is normally much higher than that of the rest of the machine shop. Such equipment is more fully utilised only when the capacity of the whole plant is increased. There are also some machines which are due to be scrapped on in the process of being reconditioned. In any calculation of idle time, key machines, auxiliary machines and machines which are not in working condition must be excluded. Further, due allowance must be made for the setting up time, as this is part of the productive process. Our Technical Adviser has estimated that at Telco the genuine idle time of machines which are regularly loaded on full production in the machine shop, wheel shop and non-ferrous shops was only 6·84 per cent. during 1955-56. The Technical Adviser regards this as reasonable. The discrepancy between this figure and the figures quoted by the Railway Board is due to the fact that the latter related to all the machines and included the setting up time. Since the genuine idle time in the three key shops mentioned above has been found to be reasonable, the Railway Board's contention that there is large surplus capacity at Telco's Works is not borne out. The erecting shop, of course, has surplus capacity, but it is of no use so long as no additional capacity is available in the machine shop.

10.2. Although the surplus capacity in Telco's machine shop is small at present, it is necessary to consider the effect on the Company's overall output and cost of the condition imposed by the Railway Board in December, 1951 that by the time the Company completes the "first lot" of locomotives, it should have established at its works the production of at least 75% of the components included in a locomotive (excluding castings, instruments and proprietory items). This condition has had the effect of restricting Telco's overall output because, whereas under present conditions Telco's machine shop capacity is sufficient for only 50 locomotives with 75% indigenous content, the Company could have produced sufficient components for a much larger number of locomotives, say, 70 for which the erecting shop has capacity, if the percentage had been suitably reduced for a portion of the output. It is not suggested that the Company should be allowed to lower the indigenous content of its locomotives for its present output of 50 locomotives, but it is necessary to recognise the effect of this condition on its output and cost. Its cost is affected in two ways: the indigenous components cost more than imported components and the reduction in output results in increasing the burden of overhead charges. In this respect, Chittaranjan has received a more favourable treatment. It has been able to make use of imported components to the extent necessary to expand its output. The Railway Board's policy in this respect was explained to us in the following terms. Chittaranjan must produce 6 locomotives every month made entirely of indigenous components, but if any pockets of spare capacity are available in any part of the Works to produce more than six locomotive sets per month, imported balancing components could be used. where necessary in order to achieve an output in excess of six locomotive per month, provided that the cost of such locomotives does not exceed the landed cost of imported locomotives. In actual practice, the condition regarding the landed cost does not seem to have been strictly observed, because in 1954-55 when Chittaranjan used an appreciable quantity of balancing components, its cost of production, excluding interest, averaged Rs. 5·63 lakhs per WG locomotive as against the figure of Rs. 5·35 lakhs fixed by the Railway Board as the landed cost for this type. Nevertheless, the 69 locomotives manufactured at Chittaranjan during 9 months from July 1954 to March 1955 were fitted with imported balancing components(*viz.* boilers 12, cylinders 30 sets, bar frames 41 sets, coupled wheels 9 sets, connecting rods 28 sets, coupling rods 23 sets and valve motion 20 sets), although under the Railway Board's ruling, at least 54 of these locomotives should have had entirely indigenous components. The above balancing components represented 11 per cent. of the actual production time per unit of these locomotives. If Telco had been given the same facilities, the spreading of overheads over a larger outturn would have brought about an appreciable reduction in its cost of production. Since Telco has now completed its programme of manufacturing 75 per cent. of the components, the question of allowing it to import "balancing components" for its present rate of output does not arise. For the future, however, the Railway Board has agreed that against the annual order for 100 locomotives which it will place with Telco for five years from 1956-57, the Company should produce at least 75 per cent. of the components for 50 locomotives and "an appreciable proportion, not less than 60 per cent."

Telco's obligation to produce 75% of locomotives components as against Chittaranjan's use of imported balancing components

of the components for the remaining 50, the programme of expansion of production being so planned that 75 per cent. of the components for the entire production would be manufactured by the end of 1958.

Heavy rejections of castings

10.3. Apart from the fact that the pattern of production from Telco's machine shop is such that its output is at present sufficient for only 50 locomotives, the capacity of the machine shop also is to a considerable extent wastefully or ineffectively utilised, so that the output is kept below normal, in spite of the capacity being almost fully occupied. This is mainly due to two reasons, namely, the bad quality of iron and steel castings obtained by the Company from Indian foundries and the consequent heavy rejections, and the low output per man. We have to examine the causes of these two difficulties, in order to ascertain how far they are due to circumstances within the control of the Company. As regards the first difficulty, we find that the Company was compelled to use indigenous castings as a result of a decision of the Railway Board. Although, in December, 1951, castings were specially excluded from the indigenous components which the company was expected to use, in December, 1952, the Railway Board advised the Company to place orders with indigenous foundries for all iron and steel castings other than the most important ones of large size. Whereas Chittaranjan had its own iron foundries, and could also draw on the resources of the Indian Railway iron foundries, Telco had to place orders with Indian foundries who had no previous experience of the high quality required in locomotive work where stresses and steam pressure are involved. For steel castings, the more reliable steel foundries had already been booked up with Chittaranjan's requirements, leaving Telco dependent on inferior sources of supply. Since the indigenous foundries did not have adequate experience of locomotive standards and were also reluctant to adopt entirely new methods for the sake of a relatively small amount of not very profitable business, an abnormal percentage of rejection occurred. These were generally of the order of 10% to 40% of the quantities ordered, but in one case amounted to 100%. The serious delays and the resulting idle time while waiting for replacements and machining them in uneconomical small quantities, together with the serious overall loss of locomotive output, have formed one of the important reasons for the higher costs at Telco as compared with Chittaranjan. It was within the Railway Board's power to avoid this difficulty by not imposing in December 1952 the strict conditions regarding the use of indigenous castings, and in fact for the 'YP' III contract due to commence in the latter part of 1956, the Company has been allowed to import these castings from Europe, and many of the items have already arrived. Our Technical Adviser has estimated that in 1955-56, the use of indigenous castings resulted in some 10 per cent. of the potential capacity of the general machine shop and the wheel shop being wasted on replacements and rectification of defective parts. The percentage was probably even greater on the groups of machines most directly affected. Since the erecting shop is able to turn out engines up to 70 per year as fast as the machine shop can supply the components, it is safe to say that but for this trouble a further 5 engines could have been turned out in 1955-56 at no extra cost in either wages or overheads other than relatively small increase in bonus payments. The locomotive outturn has been primarily affected by this trouble, as there is a much smaller number of castings on the boilers.

10.4. The other factor responsible for the relatively low output of Telco's machine shop is the low output per man. This is principally due to the fact that the time allowances established at Telco for the piece-work system are more liberal than those at Chittaranjan. Our Technical Adviser has examined Telco and Chittaranjan timings for a selection of manufacture and assembly operations, including the whole erection of the engine, and has come to the conclusion that after making adjustments for the difference in size between WG and YP locomotive parts, Telco men on an average take 20 per cent. longer than Chittaranjan men for the same series of operations. On this basis, the Technical Adviser has estimated that Telco's present system of rate fixing is causing a loss of output to the extent of about 10 to 12 engines per year. Here again, it is mainly the locomotive output which is affected, because only a very small proportion of the machine shop capacity is engaged in the manufacture of boiler components. In considering how far the liberal system of piece-work at Telco was due to circumstances within the control of the Company, we have to taken into account the origin of the system. In this respect, Telco's position is in sharp contrast with that of Chittaranjan. Chittaranjan, starting as an entirely new works in an area not closely connected with any other industrial community, has been able to spend some years on the most careful preparation before introducing the system. The Chittaranjan staff, assisted first by rate fixers from the North British Locomotive Company and subsequently by men sent to them under the Colombo Plan, have made extensive time studies over a period of two years, covering in detail the optimum performance of both men and machines. Following this, they gave the system a further one year's practical trial by means of 'Work Quota Cards' for all productive workers, before the payment by results was actually introduced. By this means the proficiency of workers was raised to the level necessary to achieve efficient operation timings, thus avoiding the fixing of uneconomical prices based on the performance of less proficient operators. This conferred on Chittaranjan an enormous advantage over Telco.

Effect of piece-work system on output per man

10.5. Telco's system of piece-work payment on the other hand was introduced as early as 1947. It is not correct to say, as the Railway Board has done in its Memorandum, that Telco's piece-work timings were not fixed on any scientific basis; in fact, the timings were based on the same principles as are followed elsewhere and were computed by the Company's Rate Fixers. The operation analysis sheets and the timings were further cross-checked in 1950-51. It is important to note, however, that Telco's workers were already on piece-work even before the building of locomotives commenced about the end of 1951, and certainly before the men, who were completely new to locomotive work, had the chance of developing any proficiency in their new work. In consequence of this the operation timings though established by analysis and time study of the operations, were evidently more liberal than they would have been if it had been possible for the Company to defer the introduction of the piece-work system for some years to permit of all men being thoroughly trained up to the required proficiency. The former East Indian Railway employees who were taken over with the works in 1945 had always enjoyed an Output Bonus

System of incentive payment, and this had to be recognised by Telco. As the locomotive work developed, the Company had to recruit more men for that work, and all the workers except those in the boiler shop had to be kept on piece-work as a means of bringing their total earnings sufficiently near to the prevailing rates of the district; otherwise, the Company would not have been able to recruit more men. If earnings of this order had been consolidated into time rates of pay (which was the only alternative), the Company would have been precluded for ever from being able to arrange that a portion of the men's earnings would be dependent on their own efforts, and this would have had an even more adverse effect on its locomotive costs. It is, therefore, quite evident that the force of circumstances, namely the location of their works and the precedent they inherited from the former East Indian Railway regime, obliged Telco to introduce a piece-work system somewhat prematurely having regard to the greater skill and preparation required for its new product. It was thus beyond the control of the Company that many of the operation timings at its works are more liberal than those which Chittaranjan was able to introduce. Unlike Telco, Chittaranjan was free, largely because of its location and the favourable conditions at its start, to carry on its preparatory work for over three years before introducing its piece-work system.

New piece-work system

10.6. From the commencement of work on the next 'YP' III contract about November 1956, the firm proposes to introduce a new piece-work system which has been worked out in conjunction with the Industrial Consultants, Messrs. Ibcon Ltd., and based on a complete revision of all the present operation timings, with modifications and improvements wherever possible. Piece-work rates will henceforth be expressed in terms of the price allowed instead of the time allowed. The firm hopes that a 20% reduction from present 'allowed times' will be achieved by eliminating the present unnecessarily slow working of many operations. It is certainly to be hoped that the Company will be successful. Nevertheless, it is a difficult matter to make reductions in piece-work prices or time allowances once these have become established. It is usually only possible to make such changes provided they are the result of a change in design or a change of method. No doubt, this point has been carefully considered already, even so, it is felt that it would be wise not to count on more than 10% saving of operation timings until the new piece-work system has been in force for some months. It should also be mentioned that the Ibcon system is substantially the same in principle as the system already in operation. It is no more scientific in method and the main difference is that rates will be expressed in money instead of in "allowed times".

Estimate of capacity revised to 70 locomotives and 30 boilers, and effect on cost

11.1. We have so far discussed two factors, namely, the interruptions caused by defective castings and the lower production per man, which are responsible for the lower output from the machine shop. It is the output from the machine shop which constitutes the principal bottle-neck at Telco and by restricting its total output of locomotives, increases the burden of the overhead charges. If these two impediments could be removed, Telco would have even

now a very good chance of achieving an outturn of 70 locomotives per year. Since the increased outturn would be achieved by eliminating the present losses of time, it need not involve any increase in the valume of overheads, except possibly in connection with indirect and supervisory staff bonus and indirect materials. An increase in the number of locomotives would correspondingly reduce the output of spare boilers. For the purpose of making a financial comparison to determine the effect on overheads, a boiler may be roughly assessed at one-third of a locomotive. On this basis, the present 50 locomotives plus 50 boilers per year would be equivalent to 67 locomotives, while the increased output of 70 locomotives plus 30 boilers would be equivalent to 80 locomotives. Our Technical Adviser has estimated that in terms of the cost per locomotive, 70 per cent. of the overheads would be reduced in proportion to the increase in outturn, while the remainder would remain constant. Consequently, if Telco were able to increase its outturn to 70 locomotives and 30 boilers (equivalent to 80 locomotives) per year, its cost structure will alter as shown in the table below.

		Estimated cost per 'YP' loco @ 70 P. A.	Target 'YP' cost based on 'WG'	Excess over Target
		Rs.	Rs.	Rs.
Direct labour		35,236	16,121	19,115
Overheads :				
(a) 70% (1,36,090) reduced by 67/80	1,13,975			
(b) 30% unchanged	58,324			
Total overheads		1,72,299	1,53,830	18,469
Materials		1,96,513	1,96,513	..
TOTAL		4,04,048	3,66,464	37,584

Comparing the above figures with those given in paragraph 8.2, it will be observed that an increase in output to 70 locomotives and 30 boilers, which, but for the two impediments discussed above, Telco can achive with its existing capacity, will reduce its excess overheads per locomotive as compared with the target figures, from Rs. 40,584 to Rs. 18,469 and the excess of its total production cost per locomotive from Rs. 59,699 to Rs. 37,584.

Effect of expansion of output to 100 locomotives on cost.

11.2. The figures in the preceding paragraph are intended only to illustrate the effect of an increase in output on the incidence of overheads. The assumed increase in output will also have the effect of reducing direct wages and this will be an additional benefit. Our Technical Adviser considers it safe to estimate the reduction in the incidence of direct wages which will take place after the introduction of the new piece-work system with the YPIII contract at only 10 per cent. in the early stages. When the Company completes

its project of expanding its capacity to 100 locomotives (with no spare boilers), the incidence of overheads will be further reduced. Since the project involves an additional capital expenditure of Rs. 84·04 lakhs, the total overheads will, of course, increase as a result of the higher provision required for depreciation. Our Technical Adviser has estimated that when the Company's capacity and output increase to 100 locomotives (with no spare boilers), its cost of production may be further reduced as shown below :—

	Estimated cost per 'YP' loco @ 100 p.a.	Target 'YP' figure based on 'WG' cost	Excess over Target
	Rs.	Rs.	Rs.
Direct labour	31,712	16,121	15,591
Overheads :			
(a) 55% of 1,72,299 reduced by 80/100	75,816		
(b) 45% unchanged	77,535		
(c) Depreciation on additional machines etc.	4,202		
Total overheads	1,57,553	1,53,830	3,723
Materials	1,96,513	1,96,513	..
TOTAL	3,85,778	3,66,464	19,314

It would appear that Telco's cost of production may be expected to show a substantial reduction when its output increases to 100 locomotives per year. The figures given in this and the preceding paragraph should not be taken as forecasts of future costs; they represent only our Technical Adviser's estimates of the likely variations in costs and we have reproduced them only to bring out the point that a substantial reduction in Telco's costs could be achieved if the present impediments to normal production could be removed and the Company's capacity increased to 100 locomotives per year.

Differences in man-hours per unit

12.1. Apart from the heavy incidence of its overhead charges, Telco also suffers from the handicap that its direct wage cost per locomotive is higher in comparison with Chittaranjan. This may be seen from the figures given in paragraph 8·2 above. This disparity in wage cost may be traced partly to the difference in the average number of man-hours required at the two works and to the different levels of earnings per man-hour. We find that the average number of man-hours per boiler during the two years 1954-55 and 1955-56 was about 12,600 hours at Telco and 9,000 hours at Chittaranjan, Telco hours being thus higher by 40 per cent. Taking the locomotive as a whole, in 1955-56, the average time taken at Telco for 42 locomotives of the YP II order was 46,428 man-hours per locomotive, whereas the

average man-hours per WG locomotive produced at Chittaranjan during the same period were 33,580 (including an addition of 4,000 man-hours saved as a result of the use of imported balancing equipment). It has been estimated that 81 per cent. of the man-hours per WG locomotive produced at Chittaranjan, *i.e.*, 27,200 hours, should be sufficient to produce a YP locomotive under Chittaranjan conditions. The man-hours actually taken at Telco exceeded this target by 71 per cent.

Causes of disparity in man-hours per unit.

12.2. We have carefully examined, in consultation with our Technical Adviser, the causes of this disparity between Telco and Chittaranjan. In the first place, Telco has been greatly handicapped by having to execute a variety of orders for spare boilers at the same time. In contrast, Chittaranjan has been in the unique position of having to build only one type of locomotive. Chittaranjan has so far received orders for 797 locomotives all of the same type. The ability to concentrate year after year on only one product is one of the important factors contributing to Chittaranjan's success and gives it a considerable advantage over Telco. The orders for spare boilers so far placed with Telco relate to as many as 9 dierent types and Telco has furnished evidence to show that it has had to process at times as many as 12 different contracts simultaneously. It is true that this obligation to supply spare boilers was voluntarily accepted by Telco under its agreement with the Railway Board; it is also true that whereas orders for quantities of 10 or less spare boilers are regarded as quite normal, the actual orders placed by the Railway Board with Telco for types other than YG or YP were in excess of 10 for each type, (the average being 24 per order, excluding the initial order for 94 SGS boilers). Nevertheless, it cannot be denied that a factory having to handle a variety of orders is at a disadvantage as compared with one which can concentrate on a single product year after year and that this fact can account for an appreciable difference in the per unit production time at the two factories. There is also no doubt that this obligation to produre a variety of boilers has been largely responsible for retarding Telco's development and inflating its costs. Another factor which is responsible for the disparity in the man-hours is the difference in the degree and frequency of inspection carried out at the two works. In their memorandum to the Commission, Telco mentioned this as one of its principal difficulties, but in their discussion with the Commission, the Company's representatives admitted that the position had improved considerably of late. We understand that the time lost while work is kept waiting for inspection is approximately 0·3 per cent. of production time. Allowing also for inspection, time spent at Telco in carefully preparing work for inspection, it is considered that the total allowance under this heading could be 1 per cent. Our Technical Adviser is of the opinion that the methods of work followed in the Telco Boiler Shop in order to maintain a high standard of workmanship are such that 5 per cent. additional time is required and that the results are well worth this extra expenditure. Lastly, the interruptions and delays caused by frequent rejections of castings as well as the liberal piece-work timings, which we have discussed earlier, involve loss of time or use of extra labour not only in the machine shop but in the whole works. Our Technical Adviser has tried to estimate the extent to which the disparity in man-hours between Telco and Chittaranjan is due to each of these factors, and although his figures cannot be regarded as strictly accurate, they are

considered near enough for practical purposes. In the case of boilers, 10 per cent. of the disparity in man-hours between Telco and Chittaranjan is attributed to Telco having to handle a variety of spare boiler orders, 1 per cent. to the different in the degree of inspection at the two works, 5 per cent. to the extra labour put in at Telco for the quality of workmanship and 20 per cent. to excess labour. In the case of locomotives, 10 per cent. of the disparity in man-hours is explained by the loss of time due to defective castings, 20 per cent. by the extra labour required on account of Telco's disadvantage in the matter of the piece-work system, 1 per cent. by the difference in the degree of inspection, 10 per cent. by the fact that Telco does not have the advantage of being able to concentrate on only one product and the balance 16 per cent. by excess labour. We have considered whether any adjustment should be made in Telco's costs on account of the 20 per cent. surplus labour in the boiler shop and 16 per cent. in the locomotive works as a whole. Unlike Chittaranjan which had the advantage of starting off with a certain number of railway employees who were already experienced in locomotive work, Telco had to train its workers from the very beginning and had consequently to recruit more men than were strictly necessary for the work in hand. In view of all the adverse circumstances which Telco has had to contend with in establishing the production of locomotives, it is not possible to say that the Company could have avoided this excess labour. Further, the Company is taking steps to build up its output to 100 locomotives per year and this will absorb the surplus labour in due course. We do not think that it would be a wise policy to ask the Company to retrench its surplus labour at this stage, as this will not merely create difficulties for it in future when it is ready to expand its production, but may also affect its production immediately by producing labour discontent. For this reason, we have made no adjustment on this account in the Company's labour cost for the past periods, but have made due allowance for the economies expected in future from the absorption of surplus labour. (*See* also paragraph 19.5).

Difference in level of earnings.

12.3. As stated in paragraph 12.1 above, the higher labour costs at Telco as compared with Chittaranjan are explained by differences in the level of earnings as well as by the disparity in man-hours required per unit of output. The Chittaranjan workers are all on monthly scales of pay with relatively higher basic rates and with piece-work bonus limited to 50 per cent. The Telco workers, on the other hand, are paid at daily rates with somewhat lower basic pay but much higher bonus than at Chittaranjan. The average earnings of all productive workers resulting from these two systems are indicated below:—

	Per hour	
	1954-55	1955-56
Telco	11·2 annas	12·2 annas
Chittaranjan	8·6 „	9·6 „

It has been estimated that the higher level of average earnings per man-hour at Telco accounts for about Rs. 7,500 per locomotive out of the total direct wage cost of Rs. 35,236 shown in the statement in paragraph 8:8 above.

High piece-work profits

12.4 Telco have a piece-work system in all shops except the boiler shop. It has been explained in paragraph 10·5 above that as a result of the Company having to introduce this system before its workers had attained normal efficiency in locomotive work as also for other reasons, the various operation timings have come to be established on a liberal basis. This has resulted in the workers engaged on piece-work basis earning high profits. During 1955, the average piece-work profits per month varied within the ranges shown below :

Shop	Minimum	Maximum
	Per cent.	Per cent.
General Machine Shop	65	88
Smith Shop	40	123
Tank & Tender Shop	133	160
Loco Tracting Shop	167	184
Copper Smithy	148	181
Frame Shop	129	18
Boiler Shop Bonus	60 for 3 boilers in August, 1955	210 for 9 boilers in May, 1955

It will be observed that the profit earnings in the machine shop are lower than those in other shops. This has given rise to discontent which it is hoped will be removed when the Company's new system of piece-work comes into force from November, 1956. The profits earned in the other shops (excluding the boiler shop which is on a different system of incentive bonus) are high ranging from 123 per cent. to 188 per cent. At Chittaranjan the rate of piece-work bonus is limited to 50 per cent. In considering these figures, it should be borne in mind that the percentages in the case of both the works are based on basic wages excluding dearness allowance. If the dearness allowance were included, the percentages of profit would be halved. Further, the basic pay of men in most grades is lower at Telco than at Chittaranjan and the incentive bonus serves the purpose of bringing the total emoluments at Telco sufficiently near to the rates prevailing in other industries in that area. The wage level at Jamshedpur is dominated by the conditions of employment at the steel works and Telco would not have been able to recruit the necessary labour without offering prospects of earnings comparable to those available at the steel works.

High output bonus in boiler shop

12.5 In Telco's boiler shop, bonus payments are based on the number of units completed in each month. This system was in force for some years in the Company's underframe shop and this gave rise to a demand for its introduction in the boiler shop. The system was introduced in 1952. It is so arranged that the bonus payments, expressed as a percentage on the men's basic wages

for each month, rise from 40 per cent. to 240 per cent., as the output of boilers increases from 2 per month to 10 per month. This system is unsatisfactory in the following respects. In the first place, unlike underframes which do not vary much in the total work involved between one design and another, boilers vary enormously in size, the design of the fire box and the complexity of the system of fire box stays, with the result that there may be five times more work in a large and complicated design of boiler than in a small simple type. In view of this difficulty, the management at Telco has had to keep a combination of large and small types concurrently in production. Secondly, the system has resulted in unduly heavy bonus payments. During 1955, the maximum bonus earned in the boiler shop was as high as 210 per cent. for an output of 9 boilers in one month. The percentage of bonus in the boiler shop works out to as high as 180 per cent. even on 8 boilers per month which is now the normal rate of production. The rates of bonus have remained unchanged, in spite of the fact that the number of workers in this shop has increased from 180 in July 1952 to 527 in July 1955. Telco have given the following explanation for this anomaly :

> "To meet our commitments under the agreement with the Government, we had to engage sufficient labour in the Boiler Shop. As experienced boiler makers were not available for employment in the country, the men recruited had in many cases very little or no skill in boiler making. We, however, continued to give the same incentive without taking into account the increased number of staff so that the experienced workers who substantially contributed towards increasing the output could be suitably remunerated. The bonus earned by new workers encouraged them to put in conscientious efforts to master the trade quickly. From the Company's point of view, payment of this additional bonus was found more economical than the cost of training these workers on a three-year course in the Training Department".

In view of the history of this case, it is difficult to decide retrospectively whether the Company could have avoided the introduction of this system and we have, therefore, made no adjustment on this account in the direct wage cost for the past period. From the commencement of the YP III contract late in 1956, however, the Company proposes to effect a gradual replacement of the present bonus system in the boiler shop by a straightforward piece-work system based on prices allowed for each job. It is hoped that this change will pave the way for a substantial saving in the number of man-hours expended per boiler by reducing the amount of wasted time which must be occurring at present.

Comparison with earnings at Tisco.

12.6 Clause 17(b) of the Agreement between Telco and the Railway Board stipulates that Telco shall not pay scales of wages exceeding those applicable to similar categories of labour at Tisco. We find that the total emoluments paid at Telco are actually lower than those at Tisco for corresponding grades.

Effect of other activities on development of loco section.

13.1 There is yet another factor to be considered before completing this analysis of the disparity in cost between Telco and Chittaranjan. Telco, unlike Chittaranjan, has other activities besides the manufacture of locomotives and boilers. It was

producing road rollers and railway underframes in the past and the production of diesel trucks now constitutes the most important part of its other activities. A feeling has been voiced on several occasions in the context of this issue that these other activities have probably interfered with the progress of the manufacture of locomotives and boilers and have thus indirectly affected the cost of these products. We find, however, that the locomotives and boilers section at Telco is quite distinct from its automobile section and we do not see why the development of one should interfere with that of the other. In any case, the diesel truck project commenced only in October, 1954 It is for this reason that we fail to appreciate how the Company could argue, as it is said to have done in the past, that its preoccupation with the diesel truck project was one of the reasons for its having to defer the necessary expansion of its locomotive capacity for some time. We have already expressed the view in paragraph 9.4 above that the Company was not justified in postponing the necessary expansion of its locomotive capacity on the ground of its preoccupation with other projects. The fact is that the diesel truck project cannot be held responsible for the slow development of Telco's locomotive/boiler division and the same can be said of Telco's other activities such as the production of road rollers and railway underframes. On the other hand, these other activities have helped to utilise some of the spare capacity in the locomotive/boiler division. The spring making plant is at present able to cope with the requirements of both the Automobile and Locomotive Divisions. Certain other miscellaneous work, such as the manufacture of flat cars for the steel works is undertaken in the boiler shop, and the whole of these extra activities amount to 17 per cent. of the total productive time. The shops mainly concerned in this are the smithy, tool room, wood working shop, general welding shop and underframe shop. Most of these activities are helping to absorb capacity which has to be provided in any case for the locomotive and boiler work but which cannot always be kept fully occupied at the present level of outturn. In this way, the other activities have helped to reduce the cost of locomotives and boilers by absorbing a part of the overheads.

Allocation of overheads between loco and non-loco work.

13.2 The Railway Board has pointed out that while the non-loco work undertaken by Telco has absorbed a part of its overheads, the share of overheads allocated to such work has been less than what is appropriate under the accepted methods of costing. This is because of a special concession granted by the Railway Board to the Company under the "formula for the allocation of overheads" which forms part of the Agreement between them, whereby the overheads to be allocated to non-loco work are to be determined only on the basis of the number of machine hours and man-hours actually utilised for such work and the rate per machine hour and man-hour calculated by dividing the total overheads by the total available hours. This method of allocation has the effect of loading on the locomotive work the entire idle time of men and machines. The Railway Board has admitted in its Memorandum that this concession was granted with a view to fostering the development of this new industry. The Board, however, argues that it was not its intention to project this concession to the period when the Company more or less attained the profit earning

stage of stable production, and that, since this stage has now been reached, normal costing methods should be restored and this special concession should cease to apply to the prices payable hereafter. As we have pointed out elsewhere, the idle time has now been greatly reduced and further, the orders for road-rollers and underframes which were previously executed in the loco shop side by side with loco work have now been completed. The problem of allocation of idle time between loco-work and non-loco work is, therefore, going to be of much less importance for the future. In any case, the period for which this concession is to operate can be ascertained by us only from the provisions of the agreed formula for allocation of overheads referred to above, paragraph IX of which states as follows : "The aforesaid method of allocating overheads and capital-at-charge..... shall be applicable *for the entire period of the contract,* but may be reviewed by mutual agreement when the conditions alter so materially as to warrant a review". If, as has been stated in its Memorandum, it was the intention of the Railway Board that the concession should not apply after the commencement of the price periods, the Board should have given effect to this intention by asking for a review of the formula as soon as it determined the dates for the commencement of the price periods. The Board has taken no such action and in the circumstances, we have no alternative but to allow the Company the full benefit of this concession. Our terms of reference for this inquiry which refer to the Agreement as part of the history of this case contain no suggestion that the prices payable to Telco are to be determined independently of the Agreement. We, of course, recognise that in allocating overheads between loco-work and non-loco work, a part of the so-called "idle-time" which represents setting-up time for non-loco work must be charged to that work.

Chittaranjan's advantages over Telco.

14. In short, most of the disparity in cost between Telco and Chittaranjan can be explained either in terms of certain special advantages which Chittaranjan has had over Telco, or in terms of certain special difficulties which Telco has suffered from in comparison with Chittaranjan. Briefly, Chittaranjan has been able to make liberal and continued use of imported 'balance components' to augment its production, whereas Telco was bound by the condition that at least 75 per cent. of its planned indigenous production must be established at its works by the time "the first lot" of its locomotives was completed; secondly, Chittaranjan was able to conclude the necessary arrangement for technical aid far more speedily than Telco; thirdly, Chittaranjan could start with a nucleus of experienced locomotive workers from the Railway Workshops, whereas Telco's men had little or no previous experience in locomotive manufacture; fourthly, Chittaranjan had a prior call on most of the dependable capacity available in the country for supply of castings, while Telco had to utilise inferior sources of supply and many of Telco's production difficulties were due to the bad quality of indigenous castings; fifthly, Telco is located in an expensive labour areas, whereas Chittaranjan is more favourably placed in this respect; sixthly, Chittaranjan was able to devote three years to developing its piece-work system and training up its men for it, whereas Telco had to introduce the system prematurely, and the liberal operation timings resulting from this fact have had adverse effects on its output and cost; and lastly, Chittaranjan has had the

advantage of being able to concentrate on only one type of locomotives, whereas Telco had had to divide its energies between two types of locomotives and nine types of spare boilers. As a result of these various factors, Telco's development has been greatly retarded and the Company is now at the stage which Chittaranjan had attained two years ago. It will be some time before Telco is able to get over its production difficulties. The current YG II contract is dependent to an even greater extent than previous contracts on the indigenous supplies of castings which have been causing serious interruptions in production. Until Telco commences its YP III contract early in 1957, it has little hope of achieving the uninterrupted flow of manufacture which Chittaranjan has enjoyed for more than a year past. It was within the control of the Railway Board to avoid or eliminate many of the factors which have adversely affected Telco's output and cost. We also find that while Telco cannot be said to have done all it could to improve the economy of its locomotive division, in none of the matters discussed above can the Company be said to have violated any part of its Agreement with the Railway Board, and this is a material consideration, since the question of fair prices to be paid to Telco cannot be examined independently of the Agreement.

Special depreciation

15.1 The adjusted costs of Telco, on the basis of which we have so far been considering the cost of disparity between Telco and Chittaranjan, include only depreciation at Chittaranjan rates. Telco, however, is allowed to charge as part of its cost of production the full amount of depreciation, including special depreciation, admissible under the Income Tax Act. Special depreciation constitutes an important element in Telco's cost. Out of the total average cost of Rs. 5,07,696 per locomotive supplied under the YP II contract in 1955-56, normal depreciation amounted to Rs. 57,743 and special depreciation to Rs. 63,551. As in the case of allocation of idle time, the Railway Board has maintained that the inclusion of special depreciation was appropriate only during the period of development and not when the Company has attained the profit earning stage. We find, however, that the Railway Board's contention is not warranted by the terms of its Agreement with the Company, in view of the following extract from the Board's letter No. SL/LM dated 14th November, 1947 :—

"With reference to the agreement entered into between Government and the Company on 20th August, 1947 it is agreed and understood (without prejudice to all items of expenditure permissible under the terms of agreement) that the following item will also be allowed or treated as part of the costs of production of boilers and/or locomotives under this Agreement :—

Any special or additional depreciation or other allowance or rebate allowed *at any time during the pendency of the Agreement* for tax purposes as an item of deductible expense under any amendment of the Indian Income Tax Act or any other statutory provision or rule of law (including any relief or exemption partial or otherwise granted under any circular of the Central Board of Revenue) in respect of machinery, plant and buildings generally or with specific reference to machinery, plant or buildings ordered, installed

or erected on or before or after specified dates or in connection with any proposal for the encouragement of new industries started at the instance of Government or for any other similar purposes".

It will be seen that the Railway Board has granted this concession for the duration of the Agreement and not for the period of development only. In these circumstances, the Railway Board's contention that special depreciation should cease to be included in the prices payable hereafter cannot be sustained.

"Even spread" of depreciation

15.2 In order to reduce the incidence of depreciation, Telco proposed that the estimated total amount of depreciation at Income Tax rates for the seven years ending 1960-61 should be spread evenly over the total number of locomotives and boilers to be produced during the period. Telco stated that the principle of even spread was agreed to at the instance of the Railway Board during the meetings held at New Delhi on the 7th, 8th and 10th December, 1951. The principle, however, has substantially different financial implications in the context of the price periods as compared with the development period. During the price periods, the Company is entitled to receive profit at 7 per cent. of capital employed, in the computation of which the written down value of fixed assets is taken into account. The lower the depreciation, the higher the written-down value of the assets and consequently the higher the amount of the capital employed. Hence, a postponement of the depreciation liability has the effect of increasing the amount of the capital employed. It is obviously undesirable that the Railway Board which is able to borrow its capital requirements at 4 per cent. should defer its depreciation liabilities and pay a profit thereon at 7 per cent. At our discussions with the Company and the Railway Board, the representatives of the Board examined this matter and informed us that if the Board had to accept the liability for the full depreciation allowable under Income Tax, it was more advantageous for it to meet the liability as and when it fell due than to spread it over the remaining period of the Agreement.

Capital employed inflated by outstanding dues.

16. The prices payable to Telco for the first two price periods are affected by a special factor. At the commencement of the first price period, Telco's Locomotive and Boiler Development Accounts stood at high figures. The Locomotive Development Account stood at Rs. 86·42 lakhs as on 1st July, 1954 and the Boiler Development Accounts at Rs. 95·89 lakhs as on 1st February, 1954. These amounts which represented a deferred liability of the Railway Board, formed part of Telco's capital employed for the first period. Subsequently, the amounts standing to the credit of the Development Accounts were reduced by stages through repayment by the Railway Board, but the effect of this on capital employed was partially offset by the fact that the Railway Board continued to limit its payment for the locomotives and boilers delivered after the commencement of the price periods to the corresponding landed costs; since the actual payments due to Telco were higher, Telco's accounts showed substantial sums as outsanding from the Railway Board and these amounts again inflated the capital employed. Any increase in

the capital employed has the consequence of increasing the amount of return payable by the Railway Board. In so far as the increase in the capital employed is due to a deferred liability, the Railway Board incurs an additional expense, because it has to pay a return of 7 per cent. on the capital employed, whereas if it were to avoid or eliminate the deferred liability so as to reduce the capital employed, the additional funds required by it for that purpose would cost it only 4 per cent. We are not sure that the additional expense incurred by the Railway Board by permitting the Development Account to remain at a high figure at the commencement of the price periods and subsequently by deferring payment of large amounts due to the Company was altogether unavoidable. The prices payable to Telco for the third price period also are affected by the fact that the Company's capital employed at the beginning of that period included certain sums due by the Railway Board to the Company, at least a substantial part of which could have been paid off earlier with a saving of interest to the Board.

CHAPTER IV

Comparison with Landed Costs

Landed costs as ceilings.

17.1 During the development period, the prices paid to Telco were equal to its actual cost of production without any margin of profits and the payments to the Company were restricted to the average landed costs of similar locomotives and boilers, the balance of the cost being carried to a Development Account. On the completion of the development period, the prices payable to the Company were to be based on the estimated cost of production and a margin of profit. The amount outstanding in the Development Account was to be absorbed in the cost of production during the price periods in eight equal instalments, unless it was paid off by Government in one or more instalments. Government has exercised the latter option and hence the Development Account is now virtually closed (except for settlement of some details). The Railway Board has urged that the whole basis of this arrangement was the understanding between the Company and the Board that upon completion of the development period, the prices payable to the Company, inclusive of a profit margin and an instalment towards the liquidation of the Development Account, will be no more than the average landed costs of similar locomotives and boilers, so that taking the development period and the price periods together, the average prices paid by the Railway Board will be no more than the landed costs. The Railway Board maintains that the prices quoted by Telco for the price periods have belied this understanding. During the Development period, according to the Railway Board's Memorandum, the total cost of locomotives and boilers delivered by Telco amounted to Rs. 634 lakhs, while the actual payments to the Company, being limited to landed costs, amounted to Rs. 404 lakhs. The difference carried over to the Development Account was Rs. 230 lakhs and in addition, an *ex-gratia* profit of Rs. 7 lakhs was allowed to the Company. Thus, the total subsidy received by the Company during the Development period was Rs. 237 lakhs which was 58.5 per cent. of the landed costs. The Company failed to attain the stipulated targets of production and had to be granted extensions from time to time. Consequently, the development period was unduly prolonged and the total development subsidy became much larger than originally expected The larger the subsidy, the greater is the margin by which the prices payable during the price periods have to be below the landed costs in order that one-eighth of the subsidy could be absorbed annually without the prices rising above the landed cost. Actually, the prices claimed by Telco for the price periods, including depreciation on an "even spread" basis and without including any instalment towards the liquidation of the Development subsidy, are higher than the landed costs, and the excess over the landed costs for the first two price periods taken together works out to 81 per cent. *i.e.*, even higher than the excess during the Development Period which was 58·5 per cent. The Railway Board considers that if Telco's claim were conceded, the failure of the Company to implement the Agreement and carry out the programme of manufacture as intended would operate to the disadvantage of the Railway Board and not so much to the party who should rightly be held

responsible for such a situation. The Board, therefore, suggests that the prices payable to Telco should be linked to the landed costs, *less* a reduction therefrom with reference to at least a portion of the development expenditure. Conceding that Telco may have been hampered by various difficulties beyond their control in reaching the stage of stable production within the period originally envisaged in the Agreement, the Railway Board are prepared to accept a reduction from the landed costs with reference to only half the development expenditure for the purpose of arriving at the prices during the price periods.

17.2 While it is not improbable that the price arrangement embodied in the Agreement was based on some such understanding as that mentioned by the Railway Board, we fail to see why this understanding was not incorporated in the Agreement. The Agreement sets out in great detail the manner in which the prices during the price periods are to be determined, and while it mentions that the actual payments during the Development Period would be restricted to landed costs, it contains nothing which would suggest that the prices payable during the price periods will not exceed the landed costs. We cannot decide this issue on the basis of the unwritten understanding claimed by the Railway Board in supersession of the detailed and specific provisions contained in the Agreement regarding the manner in which prices are to be determined during the price periods. It is true that the Railway Board will not be able to recover the Development subsidy granted to Telco unless the prices payable to the Company are lower than the landed costs, but we do not think that this fact by itself gives the Railway Board he right to expect that the cost of production will fall below the landed costs as soon as a certain level of output is attained, especially when the level of output attained is not more than half of what has all along been considered to be necessary for economic production. Further, judging from the terms of the Agreement, the Company does not appear to have given any specific undertaking that on attaining the target output of 50 locomotives and 50 spare boilers, its cost of production will be lower than the landed cost. The Railway Board has based its case partly on certain interpretations placed by it on the Agreement and partly on considerations of equity, but we find that the Board's contention on this point is warranted neither by the Agreement nor by equity. If the Railway Board's suggestion were adopted, the price per locomotive to be paid to Telco will have to be fixed at no higher than the average landed cost of Rs. 3·52 lakhs indicated by the Railway Board less a suitable amount towards liquidating one-half of the development subsidy in 8 annual instalments. It has been estimated that on this basis, having regard to Telco's actual cost of production excluding depreciation and managing agency commission, the Company would be put to a loss of about Rs. 81 lakhs for the first two price periods. If the prices for the third period also were fixed in the manner suggested by the Railway Board, the loss to the Company on the basis of the estimated costs for that period would be Rs. 25 lakhs, the total loss for the three periods thus amounting to Rs. 106 lakhs, *without providing for depreciation or managing agency commission.* We do not consider it fair to inflict this loss on the Company, (a) when the Company has already made considerable sacrifice by remaining without profits from 1946 to 1954, (b) when the Company has not been shown to have committed any

breach of the Agreement and (c) when, as shown in the preceding chapter, the Company's higher costs have been found to be due to factors many of which were beyond its control and some of which are in accordance with the Agreement which specifically provides for inclusion of some items on a generous scale as admissible components of overheads.

Landed costs as standard of comparison

18. Apart from the question of adopting landed costs as the ceiling for the prices payable to Telco, it remains to be considered how far landed costs afford a fair standard for judging Telco's performance. In the first place, the working conditions in India are so entirely different from those in other countries that any such comparison may easily be misleading. The Indian locomotive works are at a relatively early stage of development and do not have the advantage, which their foreign competitors enjoy, of getting many of the components manufactured by ancillary industries. Secondly, owing to the shrinkage of demand for steam locomotives, the locomotive builders of most countries are now faced with intense competition and are finding it difficult to utilise their capacity to the full. This has had the effect of reducing the level of world prices, in some instances to below cost of production. Thirdly, the landed cost of Rs. 3·52 lakhs quoted by the Railway Board for YP locomotive does not bear a fair relation to the landed cost of a WG locomotive which has been stated to be Rs. 5·35 lakhs. A British firm which has built both WG and YP types in large numbers has advised that the total ex-works cost of a YP locomotive is normally 76 per cent. of that of a WG locomotive. On this basis, the landed cost of a YP locomotive should be 76 per cent. of Rs. 5.35 lakhs *i.e.* Rs. 4.06 lakhs and not Rs. 4.52 lakhs. The landed costs of the WG locomotives also have probably been influenced by the shrinkage of world demand for steam locomotives. Due allowance must be made for these special factors in any comparison of domestic costs with landed costs.

CHAPTER V

Scope for Improvement at Telco

Expansion of capacity

19.1. The most urgent necessity at Telco is to increase the output up to the level of 100 locomotives per year. The Company has already decided to incur a further capital expenditure of Rs. 84·04 lakhs on additional machines and buildings and extensions to the townships, with the object of increasing the output from 50 locomotives plus 50 spare boilers to 100 locomotives per year. The machinery is already on order and due to be received during 1957. Provided there is no unforeseen delay in the receipt of this equipment, the installed capacity should be sufficient for 100 locomotives to be completed and delivered during 1958-59. To achieve this, the forge and machine shops will have to begin stepping up production to this rate from August or September, 1957.

Reduction in types of spare boliers.

19.2. On 1st April 1956, Telco still had to deliver the following spare boilers :

14 out of 17 XE	(The remaining 22 might be cancelled or obtained by them from abroad)
17 out of 47 YF	
22 out of 22 XC	
53	

If the Company continues during 1956-57 at the rate of 50 locomotives plus 50 spare boilers, it will complete these outsandings by April, 1957, but if the number of locomotives increases in 1956-57, the output of spare boilers will correspondingly fall, and the last ones will not be delivered until possible July or August, 1957. In either event, there will be four types of boilers concurrently in production throughout 1956-57, including those for the YG or YP locomotives, and probably two or three types for a part of 1957-58. Thus, the full benefit of having only one type of boilers under production may not be realised until after the middle of 1957.

Improvement in supply of castings

19.3 A higher proportion of indigenous steel castings, iron castings and brass castings is being used on the current YG II order than on any previous order, and the problems arising from rejections are likely to be acute until this order is completed, probably about January or February, 1957. The improvement in outturn resulting from a dependable supply of castings will, therefore, be realised from February,1957.

New piece-work system

19.4. Preparations for the introduction of the new Piece-Work System mentioned in paragraph 10·6 will be completed in time to introduce the system for the YP III contract, manufacture of the component parts of which will commence during the latter part of 1956. The effect of this system on improved operation timings and reduced wage costs will be seen only in 1957-58. It is

understood that the firm has given an undertaking to the Trade Union that the new system will not cause any reduction in the present bonus earnings of the men. Even so there will still be a reduction of about 15½ per cent. in the total wages cost.

Absorption of surplus labour.

19.5 As stated earlier, Telco Works have some excess labour at present which is expected to be gradually absorbed as the output increases to 100 locomotives per year. The factors which will govern the increase in production upto 100 locomotives per year are indicated below :

	Improved loco out turn should take effect from.
Elemination of defective castings	February, 1957.
Improvement in Piece-Work timings	April, 1957.
Completion of spare boiler orders	September, 1957.
Additional installed capacity of machine tools, etc., for 100 locus per years	April, 1958

The full saving in man-hours due to the absorption of excess labour cannot be realised until after the above conditions have been achieved. It is estimated that three quarters of the excess labour could be absorbed by 1958-59 and the remainder in 1959-60.

Improvements in costing system.

19.6 Certain improvements are needed in the costing system maintained at Telco. We suggest that the unit costs of each batch of locomotives should be analysed under about 40 groups of sub-assemblies which would furnish a quick over-all check for detecting variations from the estimated figure and tracing their causes. Although no useful purpose would be served by compling the detailed costs of every component, as is done at Chittaranjan, the costs of certain selected items should be recorded. The items should be chosen from the following parts which account for a major portion of the machining costs :

Bar frames
Cylinder with covers
Crossheads
Connecting rod
Coupling rods
Valve expansion link
Valve connecting rod
Piston valve complete etc.
Front and hind drag castings
Frame joint casting
Coupled wheels complete
Coupled axleboxes
Steam manifold
Rigid Water space stays
Flexible water space stays
Crown stays, etc

CHAPTER VI

Detailed Scrutiny of Costs

20.1 In its memorandum to the Commission, the Railway Board has pointed out certain defects in Telco's calculations of costs of production and profit. Our conclusions on the principal points raised by the Railway Board are briefly set out below.

Defects in cost calculations

20.2 The Railway Board has stated that in estimating its cost of production, Telco has not allowed due credit for jigs, dies and components that may be released on completion of the orders concerned and has also not taken into account the rebate of Rs. 19 per ton obtained by the Company on steel purchased from Tisco. The Board has pointed out, further, that wastages in raw materials and purchased components have been over-provided, that the number of clothings supplied for XE boilers has not been correctly stated, that the prices of steel have been over-charged at varying rates and that the overheads for YD boilers and YP locomotives have been over-estimated. We have examined each of these claims and have made the necessary corrections in Telco's cost figures. The credit for jigs, dies etc., has been determined by us separately for each order in consultation with the Technical Adviser. Full account has been taken of the rebate on steel, wastages have been allowed to the extent considered reasonable, the facts relating to the number of clothings supplied have been gone into, and the rates for steel and the calculations of overhead charges have been thoroughly scrutinised.

Actuals used for first two price periods

20.3 The Railway Board has found the profit claimed by the Company to be excessive. The Board's calculations are based on the figures of actual capital employed now available, whereas Telco's quotations were based on estimates. In determining the profit due to the Company for the first two price periods, we have based our calculations of capital employed on the actuals for these periods.

fixed assets

20.4. The Railway Board has raised the following points in regard to the value of fixed assets:

(i) that the written-down value of the fixed assets as on 1st February, 1954 has been estimated by the Company by adding one-sixth of the normal and additional normal depreciation charged during the year 1953-54 to the written-down value as on 31st March, 1954, without deducting the value of additions to assets amounting to Rs. 16·90 lakhs during February and March, 1954. The Board's criticism is valid and we have made the necessary correction in the written-down value.

(ii) that Telco has claimed profit on YP boilers (treating them on the same footing as spare boilers) from the commencement of the period C for boilers *i.e.* from 1st February, 1954, although the profit on locomotives, and therefore on the boilers fitted to the locomotives, became due only from 1st July, 1954. Here again the

Board's objection is valid. A distinction must be made between spare boilers and locomotive boilers; the latter should be treated as part of the locomotives and the profit earning period for them should be same as that for the locomotives. Hence, no profit is due to the Company in respect of YP boilers for the period 1st February to 30th June, 1954.

(iii) that Telco is not entitled to capitalise and add to the cost of its fixed assets the interest charges on its 5% debentures of Rs. 1·5 crores and on its borrowings from the Bihar Government under the Industrial Housing Scheme which amounted to Rs. 40 lakhs up to 31st March, 1954 and carried interest at 3 per cent. Telco has based its claim on the analogy of Section 107 of the Indian Companies Act and Article 166 of its own Articles of Association which permit interest on share capital during the construction period to be capitalised. We consider that the analogy does not apply to this case. Under the Companies Act, capitalisation of interest on share capital is discretionary and is subject to certain conditions, including the approval of the Central Government. Moreover, unlike interest on share capital, interest on debentures and loans can be treated as a revenue charge for income tax purposes and has in fact been so treated by the Company. Consequently, if the Company's claim were admitted, the written down value of its assets adopted for purposes of price fixation would differ from that accepted for income tax purposes and this would be contrary to the provisions of Annexure II to the First Schedule to the Agreement. The Company's claim, therefore, is not admissible.

Floating assets

20.5. As regards floating assets, the following points have been raised in the Railway Board's memorandum :—

(i) that the capital employed in the business has been inflated by the addition of estimated profits and Managing Agency commission not expected to be paid before the end of the price periods. In the opinion of the Railway Board, when the prices payable are *sub-judice,* even the difference between the cost of production and the provisional on-account payments, as appearing in the Company's books should not be treated as working capital. On this point, the Company has explained that the amount of Managing Agency commission included in the price cannot have the effect of inflating the capital employed, because the same amount is also provided as a liability until it is paid. As regards the difference between the price and the provisional on-account payments, the Company has maintained that the price, inclusive of profit, becomes a debt due and payable to the Company as and when the locomotives and boilers are delivered and that under the Agreement the outstanding debt at the end of the year is part of the capital employed. We think that the Company's claim is justified. The prices to be adopted for the purpose are, of course, not those claimed by the Company but those finally determined to be payable. It may be noted, however, that while the outstanding debts due to the Company should be treated as part of the working capital, due account should be taken of all the liabilities of the Company corresponding to the debts due.

(ii) that the loco work, the cost of production of which includes special depreciation, attracts a larger share of the total working capital than non-loco work for which no special depreciation is

charged. To avoid this, the Railway Board suggests that the element of special depreciation should be excluded from the cost of production of loco work before allocating the working capital between loco and non-loco work in the ratio of the respective costs of production Since no formula for allocation of working capital has been embodied in the Agreement, we are free to choose the basis which we consider equitable. We regard the basis suggested by the Railway Board as equitable and have adopted it.

(iii) that the Development Account balances as on 1st February, 1954 and 1st July, 1954 have been overstated by including in the Development Account the excess of the production cost over the landed cost for 10 XC boilers, 1 YD boiler and 8 YP locomotives which were actually delivered after the commencement of the price periods. The Company maintains that since the boilers and locomotives in question were actually produced in the development period, the excess of the production cost over the landed cost in respect of them was properly carried to the Development Account. We do not think that this contention is justified, because the price becomes due only upon delivery and not upon production. We have consequently adjusted the Development Account balances for this factor while calculating the Company's floating assets.

(iv) that the amounts outstanding under "sundry debtors", "stock-in-trade", "works-in-progress" and the "Locomotive/Boiler Development Account" include an element of initial depreciation which should be excluded in determining the floating assets, in order to avoid double payment of profit on this constituent of the capital employed. As profit is due on the value of fixed assets, which is not written down to the extent of initial depreciation, the Railway Board considers that payment of profit again through working capital is inadmissible. We have examined this suggestion in the light of the provisions of the Agreement and have also discussed it with the Company. The formula for determining the capital employed has been set out in Annexure II so the First Schedule to the Agreement where items like "the amount standing to the credit from time to time of the Boiler and Locomotive Development Accounts", "Stock in trade at cost" etc., have been mentioned, but there is no provision for deducting initial depreciation from the value of these items. This is quite understandable, because, under the Agreement, initial depreciation is part and parcel of the cost and it is difficult to segragate it from items like sundry liabilities or the amount standing to the credit of the Development Account, because these items do not cover the total cost but the outstanding portion of the cost. In these circumstances, it would not be correct to deduct initial depreciation from the items mentioned by the Railway Board while computing the value of floating assets. It is, of course, true that initial depreciation is not taken into account for writing down the value of fixed assets, but the value of such assets is brought down to nil in the year in which no further allowance for depreciation is claimable in respect of them for income tax purposes. The result is in spite of initial depreciation being charged as part of the cost of production, the capital employed is not allowed to be reduced by this amount for several years during which Government goes on paying the Company a profit of 7 per cent. per annum on this amount. This, however, is a direct consequence of the provision contained in clause

VIII of the agreed formula for allocation of overheads and is also a corollary of the formula laid down in Annexure II to the First Schedule to the Agreement for computing the capital employed, according to which all fixed assets are to be taken at their written down value as accepted for income tax purposes. If initial depreciation were duducted from the value of fixed assets, their written-down value would be different from that accepted for income tax purposes. For these reasons, we consider that the Company is justified both in not writing down the value of its fixed assets to the extent of initial depreciation and in making no adjustments on account of initial depreciation in the value of its floating assets.

(v) that in estimating its cash requirements as equivalent to 3 months' cost of production excluding depreciation the Company has not made due allowance for the fact that provisional payments are made by the Railway Board for work done (which includes components both manufactured and bought out). The Railway Board considers that three months' cost of production excluding stores and depreciation would be adequate. We have estimated the Company's cash requirements at 3 months' cost of production excluding direct materials and depreciation.

Recovery of additionals normal depreciation not charged to non-loco work.

20. 6. It was agreed between the Railway Board and the Company that additional normal depreciation should be distributed between loco work and non-loco work in proportion to the services rendered. In the implementation of this Agreement, the loco work received a relief of Rs. 18 lakhs up to the end of 1953-54 on re-allocation of additional normal depreciation. Telco, however, has not actually recovered this amount from non-loco work and consequently, this amount is still included in the value of its assets. On this ground, Telco now propose to charge this amount, in addition to the full additional normal depreciation from 1954-55 to 1957-58, to loco work. The Railway Board find no justification for recharging them Rs. 18 lakhs of which they were relieved on an equitable re-allocation of common expenses. We agree with the Railway Board and have disallowed the Company's claim.

Railway Board's proposal to spread estimated profit on guaranteed quantities.

20.7. While submitting its quotations to the Railway Board for the first two price periods, Telco proposed that the total profit worked out at 7 per cent. of the capital employed should be paid to it as a separate transaction in addition to the cost of production. The Railway Board regarded this proposal as unreasonable, since during these periods, the deliveries had fallen short of the guaranteed quantities. The Railway Board maintains that it should not be called upon to pay profit on capital which has been employed for the manufacture of quantities considerably in excess of 50 locomotives and 50 boilers and yet not receive even the minimum guaranteed units. The board, therefore, suggests that it would be fair and just to spread the estimated profit over the minimum guranteed units viz. 50 locomotives and 50 boilers and to pay the integrated price made up of "estimated production cost" plus the "estimated profit" on each unit actually delivered. The Company has readily agreed to this suggestion. We consider, however, that while this suggestion is advantageous to the Railway Board for the past

period, it will operate to its disadvantage in future when the deliveries are likely to exceed the guaranteed quantities of 50 locomotives and 50 spare boilers. Nor would it be fair to spread the profit over the guaranteed quantities for the past period, but to take the actual deliveries as the basis of calculation for the future. Moreover, the Railway Board's suggestion is inconsistent with clause 5(vi) (b) of the First Schedule to the Agreement according to which the estimated profit is to be spread over "all units (boilers and locomotives) to be manufactured for delivery to Government" in the price period concerned. It is true that deliveries had fallen short of the quantities specified in the Agreement during the first two price periods, but the problem of short deliveries has been dealt with in the Agreement separately under clause 22. It is also true that if prices for the first two periods had been negotiated in advance, the estimated profit would have been spread over 50 locomotives and 50 boilers, but in that case, the costs of production also would have been estimated, and it is difficult to say what the estimates would have been. Since prices for these periods have now to be fixed retrospectively, the costs of production of the number of units actually delivered have to be adopted, and hence, it would not be proper to spread profit alone over a larger number of units. For these reasons, we have spread the profit due to the Company on actual deliveries during the first two price periods and on estimated deliveries in the third price period. The prices recommended for the third period, however, are fixed prices (subject to an escalator clause), with the result that the Company will earn more or less profit according as its actual deliveries exceed or fall short of the estimated quantities.

CHAPTER VII

Fair Prices of Locomotives and Boilers supplied by Telco

21.1. We have determined the prices payable to Telco, from 1st February, 1954 for boilers and from 1st July, 1954 for locomotives, on the basis of the conclusions reached by us in the preceding chapters on the major issues in this inquiry. Several other matters of detail arising in this connection have been discussed in the Reports of the Technical Adviser and the Senior Cost Accounts Officer.

21.2. The prices determined by us relate to the following periods :—

Price periods

	Locomotives	*Boilers*
1st Price Period		
	1st July, 1954 to 31st March, 1955	1st February, 1954 to 31st March, 1955
2nd Price Period		
	1st April, 1955 to 31st March, 1956	1st April, 1955 to 31st March, 1956.
3rd Price Period		
	1st April, 1956 to 31st March, 1958	1st April, 1956 to 31st March, 1958.

21.3 The duration of the third price period was discussed by us with the representatives of the Railway Board and the Company and it was agreed that in view of the economies which the Company is expected to achieve during 1957-58, it would be of advantage to fix prices for the entire period from 1st April, 1956 to 31st March, 1958. It was not considered advisable to go beyond 31st March, 1958, because the additional capacity which the Company is planning to instal is expected to be effective early in 1958 and it is difficult at this stage to assess the consequenial changes in its cost.

21.4. Our calculations of cost of production are based on the number of locomotives and spare boilers produced and delivered, or expected to be produced and delivered by Telco in each of the price periods in question as shown below :—

Output and deliveries

	Locomotives	Spare boilers
First price period	34 YP I	12 XC I
		40 YD
		52
Second Price Period	42 YP II	13 YD
		12 YP
		6 YG
		8 YF
		3 XE
		42
Third Price Period	8 YP II	39 YF
	50 YG II	14 XE
	70 YP III	. .
	14 YG III	22 YC II
	142	75

21.5 We have proceeded on the basis that the production and delivery of a locomotive or a boiler is completed on the date on which it is despatched from Tatanagar. Thus, the date of delivery is the date of the relative railway receipt. The Company has suggested that a unit should be deemed to be delivered upon completion of the final inspection. The representatives of the Railway Board, however, felt that this suggestion would give rise to practical difficulties and maintained that the date of delivery should be determined on the basis of the railway receipt. We have adopted the Railway Board's suggestion for the purpose of the present price fixation and would leave it to the Company to pursue the matter further with the Railway Board, if it so wishes.

Variations in future costs.

21.6 We have determined, in consultation with the Technical Adviser, the man-hours required per unit of output for different locomotive and boiler contracts to be executed during the third price period. The details are given in the Reports of the Technical Adviser and the Senior Cost Accounts Officer. Due allowance has been made for the expected variations in the costs of materials. Telco have submitted a list of additional machines amounting to Rs. 16·78 lakhs which are being obtained in order to enable them to maintain a production rate of 50 locomotives plus 50 spare boilers per year. Some have been installed since the beginning of the financial year 1956-57 including the axle copying lathes, and others have still to be received. They include certain high production machines which have been found essential for maintaining the output mentioned above, and also one or two which are required as stand-by for important key machines. The list has been examined and is considered to be resonable. The cost of these machines has been included in the Company's fixed assets from the appropriate dates.

Prices recommended.

21.7. We recommend the following prices for the locomotives and spare boilers delivered by Telco during the 1st, 2nd and 3rd price periods :—

Type of locomotive/spare boiler	1st Price Period		2nd Price Period		3rd Price Period	
	No. of units	Price per unit	No. of units	Price per unit	No. of nuits	Price per unit
1	2	3	4	5	6	7
Locomotives :		Rs.		Rs.		Rs.
YP I . . .	34	6,90,105	..	..	..	..
YP II . . .	..	..	42	6,37,829	8	5,40,905
YG II . .	..	..	..	..	50	5,11,562
YP III . . .	..	..	..	..	70	4,42,755
YG III . . .	..	..	..	..	14	4,44,873
TOTAL . .	34		42		142	

1	2	3	4	5	6	7
Spare Boilers :						
XC I . . .	12	3,40,908	..	..	..	..
YD . . .	40	1,75,512	13	1,63,216	..	..
YP . . .	..	..	12	1,52,229	..	..
YG . . .	..	..	6	1,50,867	..	..
YF . . .	..	..	8	1,13,622	39	92,719
XE . . .	..	..	3	2,55,610	*6	2,37,696
					†8	2,27,584
XC . . .	..	..	..	..	22	2,08,290
TOTAL . .	52		42		75	

*With clothing
†Without clothing

Details of costs and profit have been given in the Report of the Senior Cost Accounts Officer. It will be seen that the prices for the third period are substantially lower than those for the preceding two periods.

The prices payable to Telco would have been lower than those recommended by us, if the Railway Board had accepted the principle of even spread of depreciation proposed by the Company, because the incidence of depreciation would have been lower than the actual in the earlier periods and higher in the later periods. In that case, however, as explained in paragraph 15·2, over the Agreement period as a whole, the Railway Board would have paid the same amount by way of depreciation, but a higher amount by way of profit on capital employed.

How prices should be varied from time to time

21.8. The prices recommended for the third price period may be adjusted from time to time to the extent that Government are satisfied that manufacturing costs have altered as a result of changes in railway freights, changes in statutory prices of coal and other fuel, raw materials, stores or machinery and changes in labour costs caused by labour legislation or adjudication or conciliation awards. In view of the broad scope of this "escalator clause", we have not considered it necessary to include a provision for contingency in our estimates of cost for the third price period.

21.9. Under clause 5(ii) of the First Schedule of the Argeement between the Railway Board and the Company, the prices for each future price period are to be negotiated as far as possible in advance so as to be fixed before the commencement of the price period. We recommend that a cost investigation should be made before prices are fixed for any price period in future.

CHAPTER VIII

ANCILLARY RECOMMENDATIONS

22.1. The Railway Board has recently agreed not to place further orders with Telco for spare boilers immediately after the completion of the present orders pending with the Company, and to place orders for additional locomotives in their stead. Telco request that this arrangement should be kept in force at least until the termination of the present Agreement on 31st May, 1961. In view of the urgent necessity to give Telco a period in which to build up their locomotive outturn, we support this request. We also support Telco's further request that future orders for locomotives should be confined to the YG and YP class with which the Company is thoroughly familiar.

No further orders for spare boilers and no orders for locomotive of types other than YG and YP.

22.2. We recommend that as contemplated in clause 9 of the Agreement, there should be full exchange of information and consultation between the Railway Board and the Company and that adjustments in the phasing of the Railway Board's requirements of locomotives should be made by mutual consent so as to secure maximum economy in production.

Exchange of information between Railway Board and Telco.

22.3. Each new order for spare boilers requires drawings to be prepared for the modifications desired by the Railway Board in the original specification. These new drawings are sometimes only a few, but sometimes as many as one-third of the total. It is understood that in the past the Company has had some cause to complain that the issue of the list of modifications was delayed up to one year after the placing of the order. We recommend that such delays should be avoided in future. In some cases, it may be possible for the Company to place orders for the principal materials without waiting for the list of modifications, and it could, if necessary ask for an assurance from the Railway Board that it would be safe for the Company to do so.

Delay in issue of list of modifications.

22.4. Telco ask for the Government inspection on boilers to be progressively reduced and limited to five stages only, and they give several reasons in support of this. Nevertheless, it is considered that it would be in the firm's best interests to accept the continuation of the present level of inspection as a safeguard in case any failure or defect in one of its boilers should occur in service due to misuse or other causes arising after the boiler has left its works. The present system of inspection carried out by the C.S.O. inspectors is very thorough, and although in the past it may have been irksome it is believed to cause little delay now. The time lost due to inspection is estimated to be not more than 1% of direct man-hours, which is not unreasonable having regard to the protection it affords to both parties.

Present level of inspection to be continued

22.5. The Company has suggested the appointment of a resident Metallurgist at its works in order to avoid references to Chittaranjan regarding the quality of the material received from suppliers. We are doubtful, however, whether there would be sufficient work to warrant a wholetime appointment.

Resident Matallurgist

22.6. Telco have complained that the procedure of progress payments followed at present, in accordance with the Agreement, involves preparing and submitting a large number of separate bills based on the actual number of each of the different components manufactured or purchased. The computation of individual prices of shop manufactured components and of checking the bills involves a large volume of clerical and accounting work. Under this procedure, no payment is received for the purchase of raw materials and semi-finished components or for work done on sub-assemblies or main assemblies, until after manufacture is completed and the product delivered to Government. As a result, considerable sums are required for working capital, which inflates the figure of capital employed. The Company, therefore, suggests that the system of payments may be brought in line with the practice followed by the Railway Board in respect of imported locomotives and boilers. We mentioned this suggestion at our joint discussions with the representatives of the Railway Board and the Company, and were informed that no such suggestion had been previously made by the Company. The suggestion, however, deserves examination. We recommend that the system of payments adopted in the case of Telco should not be less favourable than that followed in the case of foreign suppliers of locomotives and boilers.

Procedure of progress payments.

22.7. Telco have suggested that a Standing Advisory Committee be formed, consisting of the representatives of the Railway Board, Chittaranjan and Telco to consider and settle with despatch various important issues which arise in the normal course of manufacture, such as questions relating to material specifications, acceptable standards of quality and workmanship, improvements of production methods, wages, labour standards and productivity and similar other questions. This suggestion was discussed at length with the representatives of the Railway Board. They pointed out that the problems in respect of material specifications were already being dealt with by the Indian Standards Institution and the Central Standars Office and that so far as questions relating to acceptable standards of quality and workmanship were concerned, it was desirable to avoid any encroachment on the duties of the Inspectors. As regards other matters such as improvement in production methods and plant utilisation, it was thought that there were not sufficient common features between the broad gauge and the metre gauge engines to warrant the establishment of such a Committee. At the same time, the Railway Board officials said that the Chittaranjan management would always be glad to receive informal visits from Telco personnel at all levels for a free exchange of ideas, and we think that this would meet the case. We recommend that in order to promote closer collaboration in technical matters, Telco and Chittaranjan should arrange more frequent visits of their personnel to each other's works.

Standing Committee.

CHAPTER IX

SUMMARY OF RECOMMENDATIONS

23. Our recommendations are summarised below :—

(1) Telco should so maintain its costs as to be able to provide a break-down into about 40 groups of sub-assemblies. The costs of certain items selected from the parts listed in paragraph 19.6 should be separately recorded.

[Paragraph 19.6.]

(2) The prices recommended by us for the locomotives and spare boilers delivered by Telco during the first price period (1st July, 1954 to 31st March, 1955 for locomotives and 1st February, 1954 to 31st March, 1955 for boilers), the second price period (1st April, 1955 to 31st March, 1956) and the third price period (1st April, 1956 to 31st March, 1958), are set out in paragraph 21.7.

[Paragraph 21.7.]

(3) The prices recommended for the third price period may be adjusted from time to time to the extent that Government are satisfied that manufacturing costs have altered as a result of changes in railway freights, changes in statutory prices of coal and other fuel, raw materials, stores ore machinery and changes in labour costs caused by labour legislation or adjudication or conciliation awards.

[Paragraph 21.8.]

(4) A cost investigation should be made before prices are fixed for any price period in future.

[Paragraph 21.9.]

(5) No further orders for spare boilers and no orders for locomotives of types other than YG and YP should be placed with Telco until the termination of the present Agreement.

[Paragraph 22.1.]

(6) There should be full exchange of information and consultation between the Railway Board and the Company and adjustments in the phasing of the Railway Board's requirements of locomotives should be made by mutual consent so as to secure maximum economy in production

[Paragraph 22.2.]

(7) In order to facilitate the preparation of drawings, the Company should be informed of any modifications required in the original specifications without nudue delay.

[Paragraph 22.3.]

(8) The present level of inspection should be maintained.

[Paragraph 22.4.]

(9) The system of payments adopted in the case of Telco should not be less favourable than that followed in the case of foreign suppliers of locomotives and boilers.

[Paragraph 22.6.]

(10) With a view to promoting closer collaboration in technical matters, Telco and Chittaranjan should arrange more frequent visits of their personnel to each other's works.

[Paragraph 22.7.]

Acknowledgments.

24. We wish to place on record our appreciation of the valuable advice and assistance we have received from our Technical Adviser, Mr. D. W. Hadfield. Mr. Hadfield's wide knowledge of the problems of the locomotive industry has been of great help to us in carrying out this investigation. He has subjected every single problem referred to him to a searching inquiry and has given us an illuminating report. We have drawn upon his analysis in the preparation of the technical sections of our Report. We also wish to acknowledge the co-operation received by us from the representatives of the Railway Board, the Chittaranjan Locomotive Works and the Tata Locomotive and Engineering Co., Ltd.

K. R. DAMLE,
Chairman.

B. N. ADARKAR,
Member.

C. RAMASUBBAN,
Member.

S. K. MURANJAN,
Member.

S. K. BOSE,
Secretary.

BOMBAY,
Dated 29th September 1956.

APPENDIX I

(Vide Paragraphs 1-1 and 1-2)

GOVERNMENT OF INDIA

MINISTRY OF COMMERCE AND INDUSTRY

New Delhi, the 10th October, 1955.

RESOLUTION

Prices of locomotives and boilers.

No. Eng. Ind 17(17)/55.—By an Agrement, dated the 20th August, 1947, between the Railway Board and the Tata Sons, Ltd., the Tata Locomotive and Engineering Co., Ltd., (TELCO) undertook the manufacture and sale of boilers and locomotives at Tatanagar. The Agreement came into force for a period of 16 years from the 1st June, 1945 and provided for a certain phasing of manufacture. The Railway Board undertook to buy the production of the TELCO factory subject to certain terms and conditions, one of which was that when the factory would go into full production, the Board would buy at the rate of 50 locomotives and 50 boilers per annum. It was also agreed that if the factory achieved a higher rate of production and offered a larger number of locomotives and boilers in a year, the Board would be prepared to purchase such surplus production in preference to imports from abroad. The Agreement also provided the manner in which prices payable by the Railway Board for boilers and locomotives supplied by the Company from time to time should be determined.

2. Certain firm prices have been quoted by the Tata Locomotive and Engineering Co., Ltd., for the supply of locomotives and boilers during the periods from the 1st February, 1954, to the 31st March, 1955 and from the 1st April, 1955, to the 31st March, 1956. These prices are considerably higher than those quoted by foreign firms.

3. The Railway Board consider these prices to be excessive. In their view this may be due to a variety of factors, such as :—

(a) defects in the calculation of cost of production and profit admissible ;

(b) inclusion of special charges which could be justified only during the period of development and not when the factory has more or less attained the stage of stable production ;

(c) higher capital costs on account of additional capacity lying idle.

4. TELCO, on their side, plead their inability to quote lower prices which are based on their actual cost of production and contend, *inter alia*, that the Railway Board's insistence on 75% of the components being produced indigenously, the procedure and set-up of Railway Board's inspection at their Works as also the uneconomic size of boiler orders placed on them impede their production and as such are partly responsible for the high cost of their production.

5. It is desirable that the arguments and counter-arguments referred to above should be examined carefully before a decision is reached as regards the prices to be paid to the firm for its locomotives and boilers. Government have, therefore, decided that the necessary enquiry should be conducted by the Tariff Commission under Section 12(d) of the Tariff Commission Act, 1951 (L of 1951). The Commission is accordingly requested to conduct the necessary enquiry and submit its recommendations on :

*(i) what should be the fair prices of locomotives and boilers manufactured by TELCO since the 1st February, 1954 ;

(ii) for what period the prices recommended should hold good ; and

(iii) how the prices should be revised from time to time in future.

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*By telegram No. E. 17(17)/55, dated 28th August, 1956, the Government of India in the Ministry of Commerce and Industry confirmed the Commission's interpretation that the fair prices to be determined should relate to locomotives and boilers delivered by Telco since 1st July, 1954 and 1st February, 1954, respectively.

6. In conducting the enquiry, the Tariff Commission is requested to pay special attention to—

(a) the costing system in force in the TELCO,

(b) the effect of subsidiary business like the manufacture of trucks, etc., on the progress and cost of manufacture of boilers and locomotives,

(c) the apportionment of idle time of men and machines among the various accounts, and also to examine in particular the steps required :—

(i) to achieve the maximum economy in production, and to attain enhanced productivity and efficiency, and

(ii) to maximise the utilisation of indigenous material and capacity in the manufacturing processes, in the locomotive industry in India.

7. The Commission in its enquiry will be assisted by one or two technical experts of high calibre.

ORDER

ORDERED that a copy of the Resolution be communicated to all concerned and that it be published in the *Gazette of India*.

H. V. R. IENGAR,

Secretary to the Government of India.

APPENDIX II

(*Vide* Paragraph 2.5)

List of the Representatives of Telco and Officers of Railway Board who attended the Commission's Joint Hearing on 2nd, 3rd and 4th August, 1956.

Tata Locomotive and Engineering Company Limited.

1. Shri J. D. Choksi
2. Shri S. Moolgaokar
3. Mr. F. G. S. Martin
4. Shri V. Srinivasan
5. Shri P. J. Kuruvilla.

Railway Board

1. Shri C. T. Venugopal, Director, Finance (Expenditure).
2. Shri L. T. Madanani, Director, Mechanical Engineering.
3. Shri R. Krishnamurti, Chief Design Engineer (Loco), Central Standards Office for Railways.
4. Shri J. N. Gupta, Inspecting Officer (Locos and Boilers) Central Standards Office for Railways.
5. Shri K. S. Bhandari, Dy. F. A. & C. A. O., Chittaranjan Locomotive Works.
6. Shri N. N. Mazumdar, Secretary to the Government of West Bengal (Finance), formerly Finance Adviser and Chief Accounts Officer at Chittaranjan Locomotive Works.

GIPN—S2—8 T. C. Bom. 56—21-2-57—950


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