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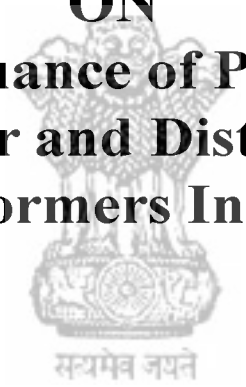
GOVERNMENT OF INDIA

TARIFF COMMISSION

REPORT
ON
The Continuance of Pretection to the Power and Distribution Transformers Industry



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GOVERNMENT OF INDIA

MINISTRY OF COMMERCE AND INDUSTRY

RESOLUTION

Tariffs

New Delhi, the 9th December, 1960.

No. 11(1)-T.R./60.—The Tariff Commission has submitted its Report on the continuance of protection to the Power and Distribution Transformers Industry on the basis of an inquiry undertaken by it under Sections 11(e) and 13 of the Tariff Commission Act, 1951. Its recommendations are as follows:—

(1) Protection granted to the Power and Distribution Transformers Industry should be continued at the existing rate of duty *i.e.*, 10 per cent *ad valorem* for a further period of three years ending 31st December, 1963 and the protective duty should be made applicable to Power and Distribution Transformers up to 10,000 KVA and 132 KV on the H. T. side and parts of such transformers, not otherwise specified.

(2) The present practice of assessing transformer oil imported with transformers to duty at the same rate as is applicable to transformer oil imported separately should be continued.

(3) In order to conserve foreign exchange each application for import of transformers up to 10,000 KVA and 132 KV on the H.T. side, either as a part of an integrated scheme or as individual item, should be thoroughly scrutinised before issuing import licences for the same.

(4) Imports of power and distribution transformers should in future be classified by voltages on the H. T. side as (i) up to 37.5 KV, (ii) above 37.5 to 66 KV, (iii) above 66 KV to 132 KV and (iv) above 132 KV. Imports under each of these categories should be further sub-classified by ratings as follows: (i) up to 3,000 KVA, (ii) above 3,000 KVA to 5,000 KVA, (iii) above 5,000 KVA to 10,000 KVA, and (iv) above 10,000 KVA. In addition to their number and value, total KVA of such imports under each range should also be recorded separately.

(5) The Government of Mysore should take immediate steps to organise the affairs of the Government Porcelain Factory, Bangalore and rationalise its production in such a manner as to enable the factory to diversify the range of its products, particularly the porcelain bushings for higher voltages and to operate up to its full capacity.

2. Government accept recommendation (1). The necessary legislation will be introduced in due course.

3. Recommendation (2) is acceptable to Government and steps will be taken to implement it in due course.

4. Government have taken note of recommendations (3) to (5) and steps will be taken to implement them as far as possible.

ORDER

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

K. R. F. KHILNANI,

Joint Secretary to the Government of India.

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APPENDICES

REPORT ON THE CONTINUANCE OF PROTECTION TO THE POWER AND DISTRIBUTION TRANSFORMERS INDUSTRY

Previous tariff inquiries

1.1. The claim of the power and distribution transformers industry to protection and assistance was first examined by the Commission in 1952. The Commission recommended that the import duty of 5 per cent *ad valorem* on power and distribution transformers upto 2,500 KVA and 37·5 K.V. on the H.T. side excluding furnace, rectifier and flame-proof transformers, should be increased to 10 per cent *ad valorem* (exclusive of surcharge which was 5 per cent of the duty) and that it should be converted into a protective duty. Protection was recommended upto 31st December 1955. Government accepted the above recommendations and granted protection upto 31st December 1955 by the Indian Tariff (Second Amendment) Act, 1953. On the recommendation of the Commission, protection was extended for another year till 31st December 1956 by the Indian Tariff (Third Amendment) Act, 1955. As a result of the second inquiry held in January 1956 the Commission recommended that protection at the same rate of duty should be continued for a further term of four years, *i.e.*, till 31st December 1960. It also recommended that the protective duty should be made applicable to power and distribution transformers upto 3,000 KVA and 37·5 K.V. and the H.T. side. Government accepted these recommendations and implemented them through the Indian Tariff (Amendment) Act, 1956.

Present inquiry

2. The present inquiry into the question of continuance of protection to the industry beyond 31st December 1960 has been undertaken by the Commission under Section 11(e) read with Section 13 of the Tariff Commission Act, 1951, under which the Commission is empowered to inquire into and report on any further action required in relation to protection granted to an industry with a view to its increase, decrease, modification or abolition, according to the circumstances of the case.

Method of inquiry

3:1. A press note was issued on 13th January 1960, inviting firms associations and others interested in the inquiry to obtain copies of relevant questionnaires from the Secretary to the Commission and submit their replies. Special questionnaires were also issued to producers, importers and consumers of power and distribution transformers. The Development Wing was requested to send a detailed memorandum on the progress made by the industry since the last inquiry and its present position. The Central Water and Power Commission was addressed to furnish a memorandum regarding the various aspects of the inquiry particularly the present and future demand for transformers in the country. The Collectors of Customs at different ports were requested to furnish data regarding c.i.f. prices and landed

costs of imported power and distribution transformers. The Directors of Industries of the States of Bombay, Madras, West Bengal, Mysore and Kerala were requested to furnish memoranda on the industry giving information in so far as the manufacturing units located in their respective States were concerned. The Chief Secretaries to all the State Governments were requested to intimate their views to the Commission, if they were interested in this inquiry. The Iron and Steel Controller was addressed for information regarding supply of steel. Letters were issued to suppliers of different raw materials, namely, electrical steel sheets, copper strips, and wires, porcelain bushings and cooling tubes. The Associations representing the interests of producers, namely, Indian Electrical Manufacturers' Association, Calcutta and Transformer Manufacturers' Association, Bombay were addressed for memoranda on the various aspects of the inquiry. Indian Standards Institution was requested to furnish information regarding the progress made in the formulation of standards for transformers above 100 KVA and 11 K.V. The Government of India Trade Representatives in the U. K., West Germany, Italy and Japan were requested to furnish the latest f.o.b. quotations of transformers in those countries. A list of those to whom the Commission's questionnaires and letters were issued and from whom replies or memoranda were received is given in Appendix I.

3.2. A statement showing the factories visited by the Commission and officers is given in Appendix II.

3.3. Shri P. M. Menon, Cost Accounts Officer, and Shri E. S. Natarajan, Assistant Cost Accounts Officer, examined the cost of production of transformers manufactured by National Electrical Industries Ltd., Bombay and Kirloskar Electric Co. Ltd., Bangalore from 4th to 9th April 1960 and from 14th to 20th April 1960 respectively.

3.4. A public inquiry into the power and distribution transformers industry was held at the Commission's office on 12th May 1960. A list of persons who attended the inquiry is given in Appendix III.

Implementation of the recommendations made in the last report

4. The recommendations made by the Commission in its 1956 Report on matters other than tariffs and the extent to which they have been implemented are briefly stated below:—

Recommendation No. 1:

> "As long as the quality of domestic transformers continues to be satisfactory and prices and delivery periods are reasonable, import restrictions should be so administered as to ensure the fullest utilisation of domestic capacity."

Government accepted the above recommendation and stated that the import policy was determined from time to time with reference to several factors, one of which was the development of the indigenous industry. The details of the import control policy subsequent to the last inquiry are given in paragraph 11.1.

Recommendation No. 2:

"The present practice of assessing the transformer oil imported with transformer at the same rate of duty as applicable to transformer oil imported separately should be continued."

This recommendation was accepted. Accordingly, the duty on transformer oil imported with power and Distribution transformers upto 3,000 KVA and 37·5 K.V. on the H. T. side has been fixed at the same rate as that on such oil imported separately, namely, 27 per cent *ad valorem* plus the excise duty leviable thereon.

Recommendation No. 3 :

"As it is essential to develop the ancillary industries speedily, it is not considered desirable to reduce the duty on raw materials. On the other hand, Government should investigate the capacity of various ancillary industries and encourage the setting up of new units if necessary. In cases where ancillary industries require technical assistance, Government should try to provide such assistance. The Development Wing should also provide a better liaison between the manufacturers of transformer and ancillary products thereof."

Government accepted the recommendation and stated that steps would be taken to implement it as far as possible. The Development Wing has informed us that efforts were being made to establish manufacture of various raw materials and components required by the transformer industry. The present position with regard to each item of raw materials is stated in detail under paragraph 9.

Recommendation No. 4:

"In view of the urgent need for the standardisation of transformers, the Indian Standards Institution should give high priority to the finalisation of the proposed standards. It is also recommended that when the standards are finalised, the Central Water and Power Commission and the Development Wing in the Ministry of Commerce and Industry should prevail upon the State Governments and private electricity undertakings to order their requirements of transformers according to the standards prescribed by the Indian Standards Institution."

The Indian Standard Specifications covering distribution transformers upto 100 KVA and 11 K.V. were published in 1958 as IS: 1180-1958. As regards standard specifications for transformers above 100 KVA and 11 K.V. rating, a memorandum has been prepared by the Indian Standards Institution and circulated to the members of its committee to elicit their views on the manner in which the specifications are to be drawn up. The draft specification is stated to be in a preliminary stage and may require some time before it is finalised. With regard to the second part of the recommendation, although there has been some response from Director General of Supplies and Disposals, Railways and a few State Governments and other consumers to accept

the ISI specifications, yet the industry has represented that there is a reluctance on the part of its customers to accept ISI specifications. The matter is dealt with further in paragraph 10·2.

Recommendation No. 5:

"Government should examine early the supply position of ,on steel sheets, and if the Tata Iron and Steel Company has difficulties in expanding its capacity, steps should be taken to establish alternative source of supply."

We are informed that the position has deteriorated since the last inquiry. The Tata Iron and Steel Company has ceased the production of transformer grade sheets and confined its capacity to the manufacture of dynamo grade sheets only. The Company has informed us that it has made provision for the manufacture of silicon steel sheets in the scheme of alloy and tool steel plant which has been submitted for approval of Government.

Recommendation No. 6:

"As domestic manufacturers have sufficient capacity to meet domestic demand upto 3,000 KVA and 37·5 K.V. on the H.T. side, delays in delivery should be avoidable to an appreciable extent, if the State Governments accept the proposed Indian Standard when placing indents and order their requirements at least one year in advance. This will give the Central Government sufficient time to decide whether the domestic manufacturers will be able to meet the requirements of any particular State in reasonable time and license imports accordingly. It is further recommended that Government Departments should not normally delay payment beyond six months after the delivery is completed. This is important as raw materials alone constitute a large fraction of the total costs of transformers."

In this connection the Governments of Orissa, Madras, Kerala, Rajasthan, Assam, Uttar Pradesh, Mysore, Himachal Pradesh and Bombay have stated that they have taken appropriate measures to implement the above recommendation. The Government of Punjab has stated that the matter is still under its consideration. The other State Governments have not so far replied. The delivery periods have, however, been reduced substantially by the producers as many of them have at present idle capacity.

Recommendation No. 7:

"It is reiterated that as recommended by the Commission in its 1952 Report, imports of power and distribution transformers should, in future, be recorded separately in Trade Statistics by numbers and the total KVA as well as by value and that such imports should be classified by voltage on H.T. side and also by ratings as per details given in paragraph 13.1.2."

Imports of transformers as recorded in the published Monthly Statistics of the Foreign Trade of India are in terms of numbers and value under K.V. and KVA classifications such as upto 3·3 K.V.—upto

25 KVA, above 25 KVA to 75 KVA..... etc., with effect from 1st January 1957. However, from January 1959 in the Monthly Statements of imports of protected commodities that are being submitted to the Commission by the Director General of Commercial Intelligence and Statistics, imports of transformers are shown in total KVA in addition to numbers and value.

Recommendation No. 9:

"The Sankey Electrical Stampings Ltd., should review its present system of rebates to all manufacturers, taking into consideration only two factors, *viz.*, the quantity purchased and the delivery period required. The new rates should be made known to all the manufacturers of transformers."

Sankey Electrical Stampings Private Ltd., Bombay has informed us that it has fully implemented the above recommendation. Accordingly, all manufacturers of transformers are given the same scale of rebates.

Recommendation No. 10:

"In view of the large potential demand for D.P.C. wires in the country, the Indian Cable Co. Ltd., and the National Insulated Cable Co. Ltd., should try to lower the prices of D.P.C. wires and strips so as to encourage greater off-take of the standard product."

The Indian Cable Co. Ltd. has informed us that in addition to reductions offered in September 1955 on paper covered rounds and in April 1956 on paper covered strips and the discount being increased from 10 to 15 per cent. their basic prices were again revised in March 1958 which resulted in a general reduction. There was a further reduction of approximately 9 per cent. in their basic prices in December 1959. National Insulated Cable Co. Ltd. also revised its prices simultaneously with the Indian Cable Co. Ltd. and offered similar reductions.

Scope of the inquiry

5. The scheme of protection to the power and distribution transformers at present covers transformers upto 3,000 KVA and 37·5 K.V. on the H.T. side excluding furnace, rectifier and flame-proof transformers. Some of the producers have represented that the scope of the present inquiry should be extended to transformers upto 10,000 KVA and 132 K.V. on the H.T. side. Indian Electrical Manufacturers' Association has also supported their claim. From the evidence available to us, we find that some of the producers are equipped to produce transformers upto 10,000 KVA and 132 K.V. while one or two have the equipment to manufacture transformers of even higher ratings. Some others have submitted schemes of expansion or have formulated plans to manufacture transformers upto and above 5,000 KVA. While in the past two years only one firm has produced transformers above 3,000 KVA, we are informed that some of the major consumers have already placed orders with the indigenous

manufacturers for transformers upto 8,000 KVA and 66 KV. Heavy Electricals Ltd., Bhopal has communicated its programme of production which is to commence in July 1960. According to it, during the first year the production of transformers will be confined to a maximum rating of 7,500 KVA and 66 KV; during the second year it has planned to go upto 25,000 KVA and 132 KV. During the third year it will produce transformers of even higher ratings and voltage. During the discussion at the public inquiry it was pointed out that while the domestic capacity is not fully utilized, imports of transformers which include those above 3,000 KVA and 37·5 KV were allowed to the extent of Rs. 251·74 lakhs in 1958 and Rs. 244·39 lakhs in 1959. Further the representatives of the industry stressed that unless the consumers give them an opportunity to produce transformers of higher ratings upto 10,000 KVA and 132 KV on the H.T. side, they have no means of proving their ability and technical competence to manufacture transformers of those types. There is substance in their contention. We find that out of the seventeen producers as many as ten have concluded agreements for technical collaboration with well-known manufacturers in foreign countries. If the transformers above 3,000 KVA and 37·5 KV produced by these foreign firms are acceptable through imports there is no reason why those produced in the country by indigenous manufacturers with their collaboration should not be equally acceptable. In our view the maximum benefit of such collaboration can be obtained only if the indigenous firms are encouraged to produce goods which were hitherto being imported thereby saving valuable foreign exchange. There is considerable idle capacity in the industry though requisite technical collaboration and equipment for the manufacture of higher ratings are available. From the evidence before us we are convinced that the industry should be in a position to satisfy the requirements of consumers for transformers of all sizes upto 10,000 KVA and 132 KV on the H.T. side. Having regard to the plans for expansion among various producers as well as the programme of production of Heavy Electricals in the next two years, the general opinion at the public inquiry seemed to be that the scope of the present inquiry should be widened to include transformers upto 25,000 KVA and 132 KV on the H.T. side. But these capacities will take some time to materialise and therefore after careful consideration we have decided that the scope of the present inquiry should be extended to transformers upto 10,000 KVA and 132 KV on the H.T. side only.

Present position of the industry and future expansion.

6.1. *Present position.*—At the time of the last inquiry there were 12 units in production and their aggregate rated capacity was 837,000 KVA on single shift. Since then four units, which were licensed then, have gone into production, namely, Hackbridge-Hewittic & Easun Private Ltd., Madras, Transformer & Switchgear Ltd., Madras, India Electric Works Ltd., Calcutta and Indian Transformers Ltd., Alwaye. Easun Engineering Co. Ltd., which obtained a licence for the manufacture of transformers has entered into

technical collaboration with Hackbridge-Hewittic Electric Co. Ltd. of United Kingdom. It has recently obtained a licence for substantial expansion of its capacity. Transformer & Switchgear Ltd. has concluded an agreement for technical assistance with Dominitwerke G. m. b. H. Hoppecke Kr. Brilon of West Germany. It has also obtained a licence for further expansion. India Electric Works Ltd. has confined itself to the manufacture of distribution transformers upto 100 KVA and 11 KV. Indian Transformers Ltd. is a small producer. A new unit, namely, Pradip Lamp Works Ltd., Patna, which was licensed for a capacity of 60,000 KVA a year went into production in early 1960. Heavy Electricals Ltd., Bhopal, under technical collaboration with A.E.I. of U.K., has a programme for manufacturing transformers of higher ratings. There are, therefore, at present 17 units engaged in the production of transformers in the private sector and one unit in the public sector The essential particulars such as capital structure, products manufactured, technical collaboration, if any, and the number of employees are given in Appendix IV.

6.2. The transformer industry has achieved considerable progress since the last inquiry. Its rated capacity (inclusive of the capacity of Heavy Electricals Ltd.) has been practically doubled and the range of its production is considerably widened and diversified. Though the majority of the units in the industry have confined their production to transformers upto 1,500 KVA and 33 KV on the H.T. side some of the producers have already installed equipment for the manufacture of transformers upto 15,000 KVA and 132 KV. Some of the units have now produced transformers above 6,000 KVA and have taken in hand the manufacture of transformers upto 10,000 KVA and 110 KV. Heavy Electricals Ltd. will have a capacity of producing transformers upto 25,000 KVA and 132 KV in the second year after it goes into production. The progress made by important manufacturers is stated below: (i) Crompton Parkinson (Works) Private Ltd. is now in a position to manufacture transformers upto 10,000 KVA and upto 132 KV and has actually produced them upto 6,000 KVA; it has also augmented its range in 1959 by the addition of instrument transformers; (ii) Associated Electrical Industries Mfg. Co. Pvt. Ltd. has extended the range upto 5,000 KVA and 37·5 KV and has plans to undertake the manufacture of furnace transformers upto 2,500 KVA; (iii) National Electrical Industries Ltd. has expanded its production range to include transformers upto 10,000 KVA and 132 KV. It has plans to manufacture valves, radiators etc. which are ancillary products; (iv) Kirloskar Electric Co. Ltd. now manufactures rectifier transformers, furnace transformers, current and potential transformers, welding transformers, etc. It has also submitted a proposal to Government to build larger transformers upto 20,000 KVA and 132 KV and after getting the necessary sanction it will be in a position to make large size transformers within three years; (v) Electric Construction & Equipment Co. Ltd. was during the current year engaged in the production of power transformers upto 66 KV. It has also installed high tension equipment for testing transformers upto 132 KV including impulse test: (vi) Transformer &

Switchgear Ltd. has increased its per unit capacity upto 5,000 KVA, and (vii) Hackbridge-Hewittic & Easun Pvt. Ltd. has installed crane with 40 tons lifting capacity, vacuum drying equipment to accommodate directly a core of upto 15,000 KVA transformer, a high tension generator and testing equipment to test upto 275 KV. It claims to manufacture transformers upto 15,000 KVA and 132 KV on the H.T. side.

6.3. The following statement gives the annual rated capacity as at the time of last inquiry and at present :—

Name of the unit	Annual capacity (Single shift)	
	In 1956 KVA	At present KVA
1. Crompton Parkinson (Works) Private Ltd., Bombay	192,000	192,000
2. Associated Electrical Industries Mfg. Co. Pvt. Ltd., Calcutta	84,000	65,000
3. National Electrical Industries Ltd., Bombay	130,000	144,000
4. Government Electric Factory, Bangalore	50,000	84,000
5. Radio Lamp Works Ltd., Bombay	30,000	42,000
6. Radio & Electricals Ltd., Madras	40,000	102,000
7. Electric Construction and Equipment Co. Ltd., Calcutta	24,000	104,000
8. Gandhi Electric Industries Pvt. Ltd., Bombay	5,000	5,000
9. General Electric Co. of India Mfg. Ltd., Calcutta	36,000	136,000
10. Kirloskar Electric Co. Ltd., Bangalore	75,000	175,000
11. Hindustan Electric Co. Ltd., Calcutta	135,000	135,000
12. Bharat Bijlee Ltd., Bombay	36,000	72,000
13. Hackbridge-Hewittic & Easun Pvt. Ltd., Madras	66,000	66,000
14. India Electric Works Ltd., Calcutta	48,000	48,000
15. Transformer & Switchgear Ltd., Madras	30,000	30,000
16. Indian Transformers Ltd., Alwaye	10,000	10,000
17. Pradip Lamp Works Ltd., Patna	Nil	60,000
	991,000	1,470,000

There was considerable discrepancy in the figures of annual rated capacity as reported by the units and as furnished by the Development Wing. This was largely due to the fact that some of the units

which have been recently licensed additional capacity have already established either whole or part of it. This matter was discussed at the public inquiry and the figures mentioned above represent the capacity already established. In one or two cases the producers claimed a higher capacity but we have accepted the capacity as reassessed by the Development Wing subsequent to the last inquiry. General Electric Co. of India Mfg. Ltd. is in the process of shifting its factory to Naini (Allahabad). Since the additional licensed capacity of 100,000 KVA will have been established soon in the new location we have taken its rated capacity at 136,000 KVA.

6.4. *Future expansion.*—We have been informed that of the nine existing manufacturers who were granted licences for expansion of their capacity, Radio & Electricals Ltd. and General Electric Co. of India Mfg. Ltd. have already carried out their expansion programme in full. National Electrical Industries Ltd. has acheived 50 per cent. of its expanded capacity and the following units have still to establish additional capacity in due course:—

Name of the firm	Net additional capacity to be established (KVA)
1. Crompton Parkinson (Works) Private Ltd.	83,000
2. National Electrical Industries Ltd. (Remaining 50%) . .	36,000
3. Government Electric Factory	120,000
4. Hackbridge-Hewittic & Easun Private Ltd.	132,000
5. Transformer & Switchgear Ltd.	70,800
6. Indian Transformers Ltd.	40,000
7. Gandhi Electric Industries Ltd.	45,000
	526,800

It will be seen that the total rated capacity of the industry when the additional capacity will be established will amount to 1,996,800 KVA as compared with 991,000 KVA in 1956. We have been informed by Heavy Electricals Ltd. that it will commence production in July 1960 and the saleable output of transformers is expected to be available by October 1961. During the first year of its production its output is expected to be about 440,000 KVA. In the second year of production it is expected to increase to 1,320,000 KVA while in the third year it expects to achieve an output of 2,120,000 KVA. It will be seen therefore that the total rated capacity of the industry in both sectors by 1962-63 will be of the order of 4,116,800 KVA. We have noted that

under the policy announced in April 1960 distribution transformers are listed as one of the items for which no additional manufacturing capacity will be licensed.

Indigenous production

7. A statement showing production of three phase and single phase transformers from 1957 is given in Appendix V. It will be observed that since the last inquiry the production of power and distribution transformers has shown a downward trend. In 1957 the production of 3 phase transformers was 10,471 in number totalling 1,224,102 KVA; in 1958 of 8,986 in number totalling 1,150,141 KVA and in 1959 of 7,567 in number totalling 1,049,693 KVA though some of the units are now engaged in manufacturing transformers of more than 5,000 KVA and upto 10,000 KVA. The production of single phase transformers was very small amounting to only 1,409 KVA in 1959. There was considerable under-utilisation of capacity in transformer industry during the past two years and the output in 1959 represented about 70 per cent. of even the single shift capacity of the industry. The reason for the decline in production has been attributed to lack of demand resulting from the pruning down of the power projects in the Second Five Year Plan period and sizeable imports. In our last report we had estimated the demand for transformers based on an increase in generating capacity by the end of 1960 to the extent of 3·2 million KW *i.e.*, at an average of 640,000 KW per year during the Second Five Year Plan period. The actual generating capacity added during the last three years was, however, much less as shown by the following figures furnished by the Central Water and Power Commission :—

1956-57	261,000 KW
1957-58	310,000 KW
1958-59	332,000 KW

Domestic demand

8.1. At the last inquiry the Commission estimated that on the basis of the ratio of transformer requirements to generating capacity at 2:1 the total requirements of transformers during the Second Plan period would be 6·4 million KVA or on an average 1.3 million KVA per year. This estimate, which related to transformers upto 3,000 KVA and 37·5 KV on the H.T. side, was based on the additional power generating capacity of 3·2 million KW which was to be installed during the Second Five Year Plan period.

8.2. During our present investigation we have received various estimates both for current and future demand for transformers. The Central Water and Power Commission has estimated the requirement of distribution transformers during 1960-61 as 1·275 million KVA assuming a ratio of 1:1·7. As regards the estimates for future, it has assumed an increase of 6 million KW in generating capacity during the Third Five Year Plan. On the basis of the ratio of generating capacity

to transformer requirements at 1:2, it has estimated that the demand for distribution transformers and a part of step-down transformers would be 12 million KVA or 2·4 million KVA per year. The Development Wing, assuming the same increase in generating capacity at 6 million KW, has spread it at 1·0 million KW during each of the years 1961-62 and 1962-63, 1·2 million KW during 1963-64, 1·3 million KW during 1964-65 and 1·5 million KW during 1965-66. Taking into account only the distribution transformers it has estimated the demand at 2·35 million KVA for each of the years 1961-62 and 1962-63 and 2·8 million KVA for 1963-64. Its present estimates *i.e.* for 1960-61 have been placed at 1·5 million KVA. The Development Council for Heavy Electrical Industries has estimated the same requirements for transformers. The Indian Electrical Manufacturers' Association has estimated the requirements of transformers at 2:56 million KVA per year based on an estimated additional generating capacity of 6·4 million KW during the Third Five Year Plan. We have also received estimates of the current and future demand from Crompton Parkinson (Works) Private Ltd., Kirloskar Electric Co. Ltd. and National Electric Industries Ltd.

8.3. Since we have decided to extend the scope of protection to cover transformers upto 10,000 KVA and 132 KV which includes a part of the requirements of step-down and even step-up transformers, it is essential to revise our estimate so as to include transformers of all types of protected categories. We therefore discussed the matter at considerable length at the public inquiry. The representative of the Development Wing suggested a basis which has been adopted by the Development Council for Heavy Electrical Industries and also discussed with the Central Water and Power Commission. The formula, which includes the entire range of transformers, is as follows :—

(a) Step-up transformers capacity . $= \frac{\text{Installed generation capacity}}{0{\cdot}85 \quad (\text{P.F.})}$

$= 1{\cdot}18 \times$ Installed generation capacity.

(b) Step-down transformers capacity . $= 1{\cdot}5 \times$ Step-up transformers capacity.

$= 1{\cdot}77 \times$ Installed generation capacity.

(c) Distribution transformers capacity $= 2{\cdot}0 \times$ Step-up transformers capacity.

$= 2{\cdot}35 \times$ Generating capacity.

Total transformers capacity required in KVA. = Step-up + Step-down + distribution transformers capcity.

$= (1{\cdot}18 + 1{\cdot}77 + 2{\cdot}35) \times$ generating capacity.

$= 5{\cdot}30 \times$ generating capacity in KW.

8.4. The representatives of the various interests agreed that to arrive at a total demand for transformers the ratio of generating capacity to transformer requirements needed revision and that the formula stated above constituted a more rational basis for estimating the same. During the discussions some modifications were suggested to lower the factors for step-down and distribution transformers. We have accepted a minor modification to bring down the ratio of step-down transformers

from 1·5 times to 1·25 times step-up transformers.* The representative of Development Wing and Central Water and Power Commission agreed to this modification. The ratio generally agreed upon is as follows :—

Step-up transformer capacity . .	. = 1·18 × installed generating capacity
Step-down transformer capacity .	. = 1·48 × installed generating capacity
Distribution transformer capacity .	. = 2·35 × installed generating capacity
Total transformer capacity .	. = 5·01 × installed generating capacity
	= *i.e.* 5·0 approximately.

Applying this ratio to the increase in generating capacity during each of the years 1961-62 to 1965-66 the estimate of future requirements works out as under :—

Year	Addition to installed generating capacity	Corresponding addition to transformer capacity required
	Million KW	Million KVA
1961-62	1·0	5·0
1962-63	1·0	5·0
1963-64	1·2	6·0
1964-65	1·3	6·5
1965-66	1·5	7·5
	6·0	30·0

During the discussion some of the representatives of producers expressed the view that the over-all ratio of 1:5 was on the high side. Subsequent to the public inquiry, information regarding the actual installation of step-down transformers for Hirakud, D.V.C. and Bhakra-Nangal systems has been received from the Central Water and Power Commission. From this, we have worked out the actual ratio of step-down transformers which is 1·9 times for Hirakud, 2·0 times for D.V.C. and 3·0 times for Bhakra-Nangal. It would, therefore, appear that the over-all ratio suggested by the Development Wing and accepted by us with the modifications mentioned above is by no means on the high side. In view of the accelerated growth of industrialisation and electrification and the key role played by generation, transmission and distribution of electrical energy we are of the opinion that this ratio offers a more realistic basis for estimating the transformer requirements during the Third Five Year Plan.

8.4. We would like to add however that the present scope of our inquiry does not cover a considerable portion of the requirements of step-down transformers and the bulk of step-up transformers. Taking into account transformers within the protected categories only the ratio between generating capacity and transformer requirements would be lower than that indicated above.

8.5. It was pointed out that these estimates should not be taken as a guide for licensing additional capacity for transformers. We should mention that the figures of addition to generating capacity are estimates whose achievement would depend on various factors. Further, there is considerable time lag between the installation of generating capacity and completion of transmission and distribution system *i.e.*, installation of requisite transformers coming only on the last lag of the system. The ratio adopted by us is a working formula for estimating the demand for transformers that is likely to arise to the extent that projects for power generation actually materialise during the Plan period. The present installed capacity of the industry on two shifts along with the production targets planned by Heavy Electricals Ltd., Bhopal appears to be adequate to cope with the demand that may arise during the Third Five Year Plan. We are sure that since the industry is at present working much below its capacity even on single shift and has plans for expansion there would be no need to license additional capacity in the near future.

Raw materials

9.1. The principal raw materials and components required for the manufacture of transformers are as follows :—

1. Silicon steel (stalloy) sheets:
   (a) hot rolled, and (b) cold rolled.
2. Insulated copper strips and wires.
3. Porcelain bushings:
   (a) high tension, and (b) low tension.
4. (a) Cooling tubes: (i) circular, and (ii) elliptical; and
   (b) Radiators.
5. Mild steel sheets and rolled sections.
6. Transformer oil.
7. Paints.
8. (i) Insulating paper, boards, tapes and bonded cork sheets etc.
   (ii) Insulating varnishes.
9. M.S. bolts, nuts, screws, washers, etc.
10. Special components.
    (a) Thermometer (dial type or ordinary type);
    (b) Cable boxes;
    (c) Terminal components;
    (d) Off-load tap changing switches;
    (e) On-load tap changing switches;
    (f) Silica-gel-breathers;
    (g) Oil level gauges;
    (h) Synthetic rubber gaskets.

9.2.1. *Silicon steel sheets*:

9.2.1.1. At the time of the last inquiry Tata Iron & Steel Co. Ltd., which was the only manufacturer of transformer grade silicon steel sheets in the country used to supply a small portion of the transformer industry's requirements. As stated earlier in paragraph 4 the Tata Iron & Steel Co. has confined its capacity to the manufacture of dynamo grade steel and its supplies of silicon steel sheets to Sankey Electrical Stampings Ltd. diminished progressively from 183 tons in 1957 to 28 tons in 1958 and only 2 tons in 1959. TISCO has submitted a scheme to Government for setting up an alloy and tool steel plant in which provision has been made for the manufacture of stalloy sheets. No alternative source of supply of silicon steel sheets has so far been established in the country. We are informed by the Development Wing that Government have under consideration a proposal for establishing manufacture of electrical steel sheets including cold rolled ones in one of the steel plants in the public sector. At present, the transformer industry depends entirely upon imports for its requirements of stalloy sheets.

9.2.1.2. Sankey Electrical Stampings Ltd., which is the principal producer of laminations, imported 1,308 tons of silicon steel sheets in 1957, 2,714 tons in 1958 and 3,472 tons in 1959. In addition, some of the producers who have their own equipment for making laminations of small sizes were allowed to import sheets direct to meet their own requirements. At present Sankey Electrical Stampings Ltd. is working much below its installed capacity and consequently the periods of delivery now range from two to six weeks depending upon the size of individual order. In view of the changing pattern of demand which involves a gradual switch-over to sheets with lower Watt losses particularly to cold rolled grain-oriented sheets, Sankey Electricals is shortly installing a special furnace for annealing these sheets. It has set up a new unit at Bangalore for the manufacture of laminations to serve the requirements of customers in South India. We are informed that Devidayal Stainless Steel Industries Private Ltd. has been licensed to manufacture laminations for transformers but it has not yet commenced production.

9.2.1.3. As mentioned above there is a definite shift in the demand of various producers of transformers to grades of steel sheets for which the Watt losses are lower. While at the time of the previous inquiry supplies were mainly of 100 grade and upward, during the last three years the transformer manufacturers have switched over to lower loss grades up to 80-70. Some of the manufacturers are using cold rolled grain-oriented sheets because the Watt losses in these sheets are almost half as much as the losses in normal hot rolled sheets. This change is in consonance with the technological advances in other countries. At the public inquiry we were informed that while the supply of electrical steel sheets has been reasonably adequate in recent years, difficulties have arisen from time to time when customers change their specifications at short notice and ask for grades which were not in stock. On the

other hand, the transformer manufacturers have complained of erratic supply and shortage of laminations of required grade of steel. It was represented that this situation was the result of the present method of purchase of silicon steel sheets. This procedure involves considerable delay and manifestly cannot take into account the requirements of grades of steel of different consumers for future use. We have however, carefully considered this aspect and are of the view that so long as the present method of purchasing silicon steel remains in force, the only solution appears to be that producers of transformers should standardise the grades that they would require and plan their requirements well in advance on Sankey Electricals if they generally obtain their laminations from this firm or on the Development Wing, if they obtain their requirements by direct imports. During the discussion some of the major producers agreed that the transformers manufacturers should standardise on two or three grades of stalloy sheets and use them in the production of transformers. We commend this suggestion and hope that transformer producers will take steps in this direction for it will facilitate the procurement of the required grades of silicon steel sheets and enable the suppliers to meet the requirements of the domestic producers.

9.2.2. *Insulated copper strips and wires.*—At the time of the last inquiry Indian Cable Co. Ltd. and National Insulated Cable Co. Ltd., were the two principal producers of copper wires and strips. Since then two more producers *viz.*, Shakti Trading Co., Bombay and Devidayal Cable Industries Private Ltd., Bombay have gone into production. The industry's requirements of cotton covered wires are now met completely from indigenous sources while a small part of the requirements of paper covered wire and strips has still to be imported. We are, however, informed by the Development Wing that further capacity is being created and the country will be self-sufficient in the matter of wires and strips shortly. It is hoped that production targets as now anticipated under paragraph 8.5 will be kept in view so that the supply position of this important raw material keeps pace with the demand. We have again received complaints from transformer producers of long deliveries and high prices of indigenous copper wires as compared with the imported ones. As stated in paragraph 4 the Indian Cable Co. and the National Insulated Cable Co. have offered reduction in prices since the last inquiry. Shri Shakti Trading Co. and Devidayal Cable Industries have been supplying D.C.C. and D.P.C. wires and strips to transformer manufacturers also. The installed capacity of Shri Shakti Trading Co. is 300 tons per year for cotton and paper covered wires and strips and after the expansion is completed its capacity for paper covered wires and strips will go up to 730 tons per year. The installed capacity of Devidayal Cable Industries is 240 tons for paper covered strips and 180 tons for cotton covered wires. At the public inquiry we were informed that the quality of the wires and strips supplied by these two producers was satisfactory. Their prices are generally lower than those quoted by Indian Cable Co. Ltd. and National Insulated Cable Co. We have, however, noticed that some of the transformer manufacturers still import their requirements of copper wires and strips while the installed capacity in the

country is not fully utilised. As further capacity has been licensed and will come into operation soon, we suggest that in administering the import control policy the domestic capacity should be taken into account.

9.2.3. *Porcelain bushings.*—There are four producers of low tension and high tension bushings in the country namely (i) Government Porcelain Factory, Bangalore; (ii) Hindustan Potteries Ltd., Calcutta, (iii) Bengal Porcelain Co. Pvt. Ltd., Calcutta; and (iv) Bengal Potteries, Calcutta. They meet generally the requirements of the industry for Low Tension bushings. As regards High Tension bushings indigenous production is limited up to 22 KV and bushings for higher voltages are imported. We are informed that Bengal Porcelain Co. has plans to double its production during the current year and it will include H. T. bushings up to 33 KV. The Government Porcelain Factory has installed the necessary equipment for the manufacture of H. T. bushings of 33 KV and above. It is, however, producing bushings only up to 22 KV. We have observed that this factory is, for various reasons, working much below its capacity. We, therefore, recommend that the Government of Mysore should take immediate steps to organise its affairs and rationalise its production in such a manner as to enable the factory to diversify the range of its products, particularly the porcelain bushings for higher voltages and to operate up to its full capacity. We are of the opinion that the transformer industry should use the indigenous bushings as far as possible for the domestic producers need encouragement to produce bushings for higher voltages.

9.2.4. *Cooling tubes.*—In 1956 Premier Automobiles was the only supplier of seam welded tubes to the transformer industry in the country. Since then Tube Products of India Ltd. has commenced production of tubes, including elliptical tubes, and is supplying the bulk of the demand of the transformer industry. The producers seem to be generally satisfied with the quality and deliveries of the indigenous tubes. Radiators are used in place of tubes for more efficient cooling of transformer oil. Although there is as yet very little demand for radiators, it is expected to increase with the manufacture of higher capacity transformers. We are informed that Crompton Parkinson (Works) Private Ltd. are making them for their own use.

9.2.5. *M. S. sheets and rolled sections.*—The Iron & Steel Controller controls the distribution and prices of mild steel sheets and rolled sections. The transformer producers obtain their requirements on the recommendation of the Development Wing. As there is considerable shortage of these materials most of the manufacturers have complained of long and irregular deliveries. We are informed that the position will improve in the middle of 1961 when the steel plants in the public sector go into full production.

9.2.6. *Transformer oil.*—The transformer oil imported with transformers is assessed at the same rate of duty as applicable to transformer oil imported separately. We recommend that the same practice should continue. We may add that as projects for new refineries are under Government's consideration, the possibility of producing transformer oil in one of the them may be borne in mind.

9.2.7. *Insulating materials.*—Insulating materials excepting bakelite sheets and sections and empire cloth and sleeves are being imported.

9.2.8. *Special components.*—Some of these items are now available from indigenous sources. But dial type thermometers, On-load tap changing switches, silica-gel-breathers, megnetic oil level gauges and synthetic rubber gaskets are imported.

9.3. The following statement shows the proportions of imported and locally purchased materials to the total fair ex-works prices of four types of transformers manufactured by the two costed units in 1955-56 and 1958-59.

	25 KVA		50 KVA		100 KVA		1500 KVA	
	1955-56	1958-59	1955-56	1958-59	1955-56	1958-59	1955-56	1958-59
	%	%	%	%	%	%	%	%
1. Imported Materials.	35·77	26·00	47·51	24·57	46·04	18·67	41·44	34·90
2. Locally purchased materials.	21·10	29·51	32·66	57·97	34·42	59·62	27·06	33·59
3. Totals of 1 & 2.	56·87	55·51	80·17	82·54	80·46	78·19	68·50	68·49
4. Total Fair ex-works price.	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00

It will be observed that the cost of material constitutes from 55·51 to 82·54 per cent of the total fair ex-works price of transformers. The imported material which was on an average about 40 per cent of the total ex-works price in 1955-56 now ranges from 18·67 per cent for comparatively smaller sizes to 34·90 per cent in respect of bigger sizes. This indicates that the industry's dependence on imported materials has been appreciably reduced. We have, however, noticed that some manufacturers still display marked preference for imported materials even when these are indigenously available at fairly reasonable prices. It would appear therefore that some transformer producers have not taken positive steps to encourage the development of ancillary industries in the country in spite of our observations in paragraph 10·9 of our last report. We, therefore, suggest that import policy regarding raw materials required by the transformer industry should be so administered as to permit full utilisation of the domestic capacity of these ancillary industries.

9.4. The manufacturers have represented that the aggregate element of customs duty on imported materials used in the manufacture of transformers was fairly heavy and this tends to push up their cost of

production. We have examined this question carefully and have found that the total element of customs duty included in the cost of selected types of transformers varied from 3 to 7 per cent in the cost of transformer. This is by no means a heavy charge and in our view, therefore, there is no case for any reduction in the existing rates of customs duty on various raw materials

Quality

10.1. In our previous report we had observed that while the quality of transformers made by well-established manufacturers in the country was generally satisfactory, some minor defects like oil leakage continued to persist for want of proper attention. The major manufacturers have now informed us that they have carried out improvements in the technique of production and have arranged for rigorous tests of transformers at each stage of manufacture and before delivery. The Central Water and Power Commission has stated that in the course of supplying information regarding requirements of transformers of capacities 1000 to 7500 KVA 66/33/11 KV a few large electricity undertakings have stated that transformers supplied by indigenous manufacturers have generally proved satisfactory. The Development Wing has observed that the industry has made considerable progress and the quality of transformers manufactured in the country is generally satisfactory. The consensus of opinion among consumers is that the quality of the domestic transformers is generally good and comparable with that of the imported ones. A few of them have pointed out defects of a minor nature which were rectified on their being brought to the notice of the producers.

10.2. The representatives of the industry have raised again the question of standardization. The Indian Standards Institution brought out in 1958 the standard specification IS : 1180 covering transformers up to 100 KVA and 11 KV. Further it has taken in hand preparation of standards above this size and considerable progress has been made. It has been represented to us by various manufacturers that although the Indian Standards for 100 KVA and 11 KV have been laid down, the State Electricity Boards and private electricity undertakings do not adhere to the specifications laid down but prescribe their own specifications for each individual requirement. The result, it was reported, is a wide variety in each customer's requirements relating to voltage ratio, impedance, temperature rise, rating, fittings, tappings, etc. These variations go against standardization, require maintenance of a variety of stocks of raw materials and components with producers and considerable amount of fresh designing and draughting, which results in lower productivity and higher costs. We are informed by the Indian Standards Institution that the Director General of Supplies and Disposals and the Railway Design and Standardization Organisation have now officially adopted its standards and most of the State Governments have given the Indian Standards Institution general undertaking that they would adopt Indian Standards in their purchase programmes. However, during the discussion, it was found that some of the State Electricity Boards and private electricity undertakings still insist on their own

specifications which deviate in many respects from the specifications laid down in the Indian Standard. We are advised that the distribution transformers up to 100 KVA and 11 KV are generally used on the last lag of a distribution system and are not required to run in parallel with each other. There is, therefore, little warrant for prescribing special voltage ratio, tappings or impedance. We have drawn the attention of the Central Water and Power Commission to this representation. The Central Water and Power Commission has shown its appreciation of the important role played by the uniformity of specifications in solving difficulties of Indian manufacturers and has promised to pursue the matter with the State authorities. In view of the abvious advantages of standardisation and the desirability of the purchasers adhering to specified standards, we suggest that whenever a tender invitation deviates from the ISI specifications, the producers should bring this to the notice of the Central Water and Power Commission, the Development Wing and the Indian Standards Institution who should take positive steps to prevail upon the authorities concerned to order their requirements of transformers according to the standard prescribed by the Indian Standards Institution.

Import control policy and imports

11.1. *Import control policy.*—For the purpose of import control, power and distribution transformers are classified under Serial No. 42 (a) and (d) of Part II of the Import Trade Control Schedule. The licensing policy for the different periods since 1st July 1956 is given below :

(i) *July-December* 1956.—During July-December 1956 soft currency licences for transformers up to 1500 KVA and 22 KV on the H.T. side were granted to established importers to the extent of 25 per cent of one half of their best year's imports of transformers of this category only. Licences were also issued on an *ad hoc* basis to State Electricity Undertakings and Multipurpose Project Authorities. No licences were issued to other actual users and new-comers.

In the case of other types of transformers licences were granted to established importers to the extent of 100 per cent of one half of their best year's imports. Actual users and new-comers were also eligible to apply. Not more than 50 per cent of the face value of licences granted under this sub-item could be utilised for import of transformers of ratings up to 3,000 KVA/37.5 KV other than those falling under serial No. 42(a). Up to 50 per cent of the face value of licences could be utilised for imports from Dollar Area. The maximum value for which a new-comer could obtain licence was fixed at Rs. 10,000.

(ii) *January-June* 1957.—In respect of transformers up to 1500 KVA and up to 22 KV on the H.T. side the policy was the same as in the previous period. In the case of other types new-comers were not eligible to apply and licences were not valid for imports from Dollar Area.

(iii) *July-September* 1957.—During this period no imports were allowed.

(iv) *October* 1957—*March* 1958.—During October 1957—March 1958 no licences were granted for import of transformers up to 1500 KVA and 22 KV on the H.T. side. In the case of other types of transformers the quota for established importers was reduced to 40 per cent from 100 per cent, the other conditions being the same as in the previous period.

(v) *April-September* 1958.—Policy remained the same as in the previous period.

(vi) *October* 1958—*March* 1959.—Policy remained the same as in the previous period.

(vii) *April-September* 1959.—During this period no licences were issued for import of transformers up to 1,500 KVA and 22 KV on the H.T. side. In the case of other types of transformers the quota for established importers remained at 40 per cent as in the previous periods. But licences issued under this item were not valid for import of transformers of ratings up to 3000 KVA/37.5 KV.

(viii) *October* 1959—*March* 1960.—In respect of transformers up to 1,500 KVA and up to 22 KV on the H.T. side the policy remained the same as in the previous period.

As regards other types of transformers no licences were issued to established importers. Actual users were allowed to apply. Licences issued under this item were not valid for import of transformers of ratings up to 3000 KVA/37.5 KV. Applications from established importers for import of spare parts of this item against their imports of complete machinery falling under this serial number were considered by the Joint Chief Controller of Imports, Calcutta and licences were granted on a quota basis of $2\frac{1}{2}$ per cent of half of their best year's imports in the basic period. Such licences, where granted, were not valid for import of spare parts, the import of which was otherwise prohibited.

(ix) *April-September* 1960.—For transformers up to 1500 KVA and up to 22 KV on the H.T. side the policy remained the same as above.

In regard to other types of transformers licences are issued to established importers to the extent of 15 per cent of one half of their best year's imports. Actual users are also allowed to apply. Other conditions remain the same as in the last period.

11.2. *Imports.*—Imports of transformers of all kinds in terms of numbers and value for the three years 1957, 1958 and 1959 were as follows :—

(In lakh rupees)

	Numbers	Value
1957	1,890	303·58
1958	1,715	251·74
1959	1467	244·39

We set out below the imports that have taken place of transformers upto 1500 KVA :—

(In lakh rupees)

	Numbers	Value
1957	1532	99·43
1958	1481	66·67
1959	320	31·12

We are informed that although licensing to established importers for import of transformers upto 1500 KVA was banned since July 1957, special licences were issued to other category of importers in consultation with the appropriate authorities. It was represented to us at the public inquiry that while the domestic installed capacity of the industry is not fully utilised even for one shift, imports are being allowed in those categories of transformers which are easily available in the country. It is likely that some of the imports which took place in 1957 and 1958 were covered by licences issued in the earlier period and some of them were issued to actual users. Howsoever that might have been in the past, but since the scheme of protection has now been extended to cover power and distribution transformers upto 10000 KVA and 132 KV on the H.T. side we are of the opinion that the industry would be able to consolidate its position only if it is called upon to fulfil the demand for transformers of higher ratings also and its capacity is fully utilised. We recommend, therefore that in order to conserve foreign exchange each application for import of transformers upto 10000 KVA and 132 KV on the H.T. side either as a part of an integrated scheme or as individual item should be thoroughly scrutinized before issuing import licences for the same. There is, at present, considerable idle capacity but it is possible to visualize a time when the industry will become fully occupied and periods of delivery may be prolonged and on the ground of longer deliveries, the large consumers may press their demands for importation of their requirements. Anticipating such a situation to arise during the Third Five Year Plan we suggest that the Central Water and Power Commission should advise all State Governments and other large consumers to plan their requirements well in advance and place their orders with indigenous manufacturers so as to secure deliveries of transformers according to a phased programme.

11.3. In para 13.1.2 of our last report we had recommended that imports of power and distribution transformers should be recorded separately in trade statistics by numbers, and the total KVA as well as by value in accordance with the classification by voltages and ratings mentioned therein. Since, however, the scheme of protection has been extended to cover transformers upto 10000 KVA and 132 KV on the H.T. side we are of the view that detailed statistics of imports relating to transformers below 3000 KVA and 37.5 KV on the H.T. side are not

of much importance now. We, therefore, recommend that imports of power and distribution transformers should, in future, be classified by voltages on the H.T. side as (i) upto 37.5 KV, (ii) above 37.5 to 66 KV, (iii) above 66 KV to 132 KV, and (iv) above 132 KV. Imports under each of these categories should be further sub-classified by ratings as follows: (i) upto 3000 KVA, (ii) above 3000 KVA to 5000 KVA, (iii) above 5000 KVA to 10000 KVA, and (iv) above 10000 KVA. As statistics of imports by number and value only are inadequate, we recommend that their total KVA under each range should also be recorded separately.

Existing rate of duty

12. Power and distribution transformers upto 3000 KVA and 37.5 KV are assessed to duty under item No. 72(39) of the First Schedule to the Indian Tariff Act, 1934 the relevant extract from which is reproduced below :—

Sl. No.	Name of article	Nature of duty	Standard rate of duty	Preferential rate of duty if the article is the produce or manufacture of			Duration of protective rates of duty
				The U.K.	A British Colony	Burma	
*72(39)	Power and Distribution Transformers upto 3,000 KVA and 37.5 KV on the H. T. side (Primary voltage being over 250) excluding furnace, rectifier and flame proof transformers	Protective	10 per cent *ad valorem*	..	..	..	December 31st, 1960

*NOTES.—Under Government of India, Ministry of Finance (Department of Revenue), Notification No. 100-Customs, dated the 16th May, 1957, Porcelain bushings which are component parts of transformers falling under this Item are exempt from the payment of so much of the Customs duty leviable under the First Schedule to the Indian Tariff Act, 1934, as is in excess of 5 per cent *ad* Valorem.

Commission's estimate of fair ex-works price of transformers

13. Our Cost Accounts Officers have examined the cost of production of transformers manufactured by two units, namely, National Electrical Industries Ltd., Bombay and Kirloskar Electric Co. Ltd., Bangalore. National Electrical Industries Ltd. produces power and distribution transformers of various ratings and voltages including higher ratings upto 8000 KVA. Kirloskar Electric

Co. has now been engaged in this line for over 5 years and has produced transformers of various ratings. We have discussed the details of actual cost of production for the latest periods for which cost data were available from these two companies and have framed our estimates of cost and prepared the fair ex-works prices of 25 KVA, 50 KVA, 100 KVA, 750 KVA with voltage range of 11 KV/44 V and 1500 KVA and 3000 KVA with voltage range of 33 KV/11 KV. As the producers have desired that details of cost should be kept confidential the reports of the Cost Accounts Officer are forwarded as confidential enclosures to this report. Our estimates of fair ex-works prices are given below :—

	25 KVA N.E.I.	50 KVA Kir.	100 KVA N.E.I.	750 KVA N.E.I.	1500 KVA N.E.I.	3000 KVA N.E.I.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Net material cost .	1420·6	2639·0	3138·5	13530·3	24190·7	44894·9
Conversion charges .	894·6	325·4	1489·1	5303·4	8403·6	18358·0
Packing charges	73·1	36·3	106·5	313·7	614·9	1041·6
Works cost .	2388·3	3000·7	4734·1	19147·4	33209·2	64294·5
Return on capital employed	90·0	134·1	203·6	992·8	1820·5	3566·3
Fair ex-works price . .	2478·3	3134·8	4937·7	20140·2	35029·7	67860·8

Both units have plans to expand production to include transformers of higher ratings and voltages. We have, therefore, assumed production at a higher level than that of the actual period on the basis of single shift and suitable adjustments have been made in the estimates of cost. The latest rates of purchase of raw materials have been adopted and the consumption of raw materials for manufacture of different kinds of transformers has been taken on the basis of the actuals. Provision has been made for annual increments in wages and salaries and other overheads. Depreciation has been calculated at normal income-tax rates on single shift working. Return on capital employed as assessed by us has been allowed at 10 per cent, the element of working capital having been estimated to be equivalent to four months' cost of production.

C. i. f. prices

14. There has been a ban on imports of power and distribution transformers of ratings upto 3000 KVA and 37.5 KV since April 1959, excepting for some imports on special licences issued to actual users. As such it has not been possible for us to obtain reliable quotations of imported transformers in these categories and those which we have received do not include the ratings of transformers which have been

selected for cost investigation and consequently, are not comparable. We have obtained estimates of c.i.f. prices through the Office of the High Commission of India in the United Kingdom and the Embassy of India in Japan. The Central Water and Power Commission has also furnished c.i.f. quotations of transformers from West Germany. We have taken six sizes of power and distribution transformers for comparison of domestic cost with c.i.f. prices in order to determine the quantum of protection required by the domestic industry. The c.i.f. prices adopted by us are given below :—

Rating and source of import	c.i.f. price
	Rs.
25 KVA (JAPAN)	1960·00
50 KVA (JAPAN)	2533·33
100 KVA (JAPAN)	4360·00
750 KVA (JAPAN)	25666·67
1500 KVA (U. K.)	37047·33
3000 KVA (U. K.)	60206·00

Comparison between landed costs of imported transformers and fair ex-works prices of domestic transformers

15. The following statement gives the comparison of c.i.f. and landed costs of imported transformers with the fair ex-works prices of indigenous products :

Statement showing the comparison of c.i.f. and landed costs of foreign transformers with fair ex-works prices of domestic transformers

Rating	c. i. f. price	Customs duty	Clearing charges	Landed cost ex-duty	Fair ex-works price	Difference between fair ex-works price and landed cost ex-duty	Difference as a percentage on c.i.f. price
1	2	3	4	5	6	7	8
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	%
11 *KV*/400 *V*							
25 KVA	1960.00	196.00	98.00	2058.00	2478.30	420.30	21.44
50 KVA	2533.33	253.33	126.67	2660.00	3134.80	474.80	18.74
00 KVA	4360.00	436.00	218.00	4578.00	4937.70	359.70	8.25
00 KVA	25666.67	2566.67	1283.33	26950.00	20140.20	(—)6809.80	(—)26.53
33 11 *KV*							
00 KVA	37047.33	3704.73	1852.37	38899.70	35029.70	(—)3870.00	(—)10.45
00 KVA	60206.00	6020.60	3010.30	63216.30	67860.80	4644.50	7·71

16. It will be seen that the domestic industry is at a disadvantage ranging from 8·25 to 21·44 per cent of c.i.f. prices in respect of smaller sizes of transformers upto 100 KVA. It enjoys some advantage to the extent of 26·53 per cent in 750 KVA and 10·45 per cent in 1500 KVA over its competitors in overseas countries. Again, in sizes of 3,000 KVA and above the indigenous producers face competition from foreign producers, as the c.i.f. quotation for 3,000 KVA is lower by 7·77 per cent. At the public inquiry the producers represented that whenever they tendered to State Electricity Boards and other private electricity undertakings in the country, they were invariably faced with severe competition from continental producers. Further, they maintained that c.i.f. quotations furnished to us are merely list prices whereas foreign producers, when they actually quote for a specific tender, offer prices which are competitive and considerably lower. One of the producers went so far as to argue that some of the foreign producers quote dumping prices in order to eliminate competition from indigenous producers. They apprehended that such competition will continue in future also. The domestic industry has achieved considerable progress since the last inquiry and has expanded its capacity and installed equipment to produce transformers of higher ratings. It can offer power and distribution transformers of quality comparable with that of the imported ones and in the context of keen internal competition, the domestic prices are reasonable. It is, however, necessary that the domestic producers should be encouraged to carry out their schemes of expansion and manufacture transformers of larger sizes. With the commissioning of the factory of Heavy Electricals at Bhopal we feel that the country's dependence on imports of power transformers of even the higher ratings should be considerably reduced. In view of these conditions we recommend that protection granted to the industry should be continued at the existing rate of duty for a further period of three years, *i.e.;* upto 31st December 1963.

Continuance of protection

This duty should be made applicable to power and distribution transformers upto 10,000 KVA and 132 KV on the H.T. side and parts of such transformers, not otherwise specified.

17. If the recommendation in paragraph 16 is accepted it would be necessary to alter item No. 72(39) of the First Schedule to the Indian Tariff Act, 1934 to read as follows:—

Changes in the Indian Customs tariff

Item No.	Name of the article	Nature of duty	Standard rate of duty	Duration o protectiv duty
*72(39)	Power and distribution transformers upto 10000 KVA and 132 KV on the H. T. side (primary Voltage being over 250) excluding furnace, rectifier and flame-proof transformers and parts of such transformers, not otherwise specified.	Protective	10 per cent *ad valorem*	December 31st, 1963

*NOTES.—Under Government of India, Ministry of Finance (Department of Revenue), Notification No. 100-Customs, dated the 16th May, 1957, Porcelain bushings which are component parts of transformers falling under this Item are exempt from the payment of so much of the Customs duty leviable under the First Schedule to the Indian Tariff Act, 1934, as is in excess of 5 per cent *ad valorem*.

Further, item (vi) of Notes (4) under I.C.I. Item No. 72 would require suitable amendment.

18. Our conclusions and recommendations may be summarised as under :

Summary of conclusions and recommendations

(i) The scope of the present inquiry covers power and distribution transformers upto 10,000 KVA and 132 KV on the H.T. side.

[Paragraph 5]

(ii) The present capacity of 17 units in the industry, which are in production, is 1,470,000 KVA a year. With the completion of expansion schemes by the existing units and establishment of new units already licensed, the capacity of the industry will increase to 4,116,800 KVA by 1962-63.

[Paragraphs 6.3 & 6.4]

(iii) The production of 3 phase transformers was 10,471 in number totalling 1,224,102 KVA in 1957, 8,986 in number totalling 1,150,141 KVA in 1958 and 7,567 in number totalling 1,049,693 KVA in 1959.

[Paragraph 7]

(iv) The Government of Mysore should take immediate steps to organise the affairs of the Government Porcelain Factory, Bangalore and rationalise its production in such a manner as to enable the factory to diversify the range of its products, particularly the porcelain bushings for higher voltages and to operate upto its full capacity.

[Paragraph 9.2.3]

(v) The present practice of assessing transformer oil imported with transformers to duty at the same rate as is applicable to transformer oil imported separately should be continued.

[Paragraph 9.2.6]

(vi) The consensus of opinion among consumers is that the quality of domestic transformers is good and comparable with that of the imported ones.

[Paragraph 10.1]

(vii) In order to conserve foreign exchange each application for import of transformers upto 10,000 KVA and 132 KV on the H.T. side, either as a part of an integrated scheme or as individual item, should be thoroughly scrutinised before issuing import licences for the same.

[Paragraph 11.2]

(viii) Imports of power and distribution transformers should in future be classified by voltages on the H.T. side and ratings as indicated in paragraph 11.3 and in addition to their number and value, total KVA of such imports under each range should also be recorded separately.

[Paragraph 11.3]

(ix) Protection granted to the power and distribution transformer industry should be continued at the existing rate of duty *i.e.* 10 per cent *ad valorem* for a further period of three years ending 31st December 1963 and the protective duty should be made applicable to power and distribution transformers upto 10,000 KVA and 132 KV on the H.T. side and parts of such transformers, not otherwise specified.

[Paragraph 16]

(x) If the recommendation for continuance and expansion of the scope of protection is accepted necessary changes in the First Schedule to the Indian Tariff Act, 1934 should be made as indicated in paragraph 17.

[Paragraph 17]

Acknowledgements

19. We wish to thank the representatives of producers, importers and consumers of transformers, the producers of raw materials and the Government departments concerned who furnished us with valuable information in connection with this inquiry and gave evidence before us.

K. R. P. AIYANGAR,
Chairman.

S. K. MURANJAN,
Member.

R. S. BHATT,
Member.

RAMA VARMA,
Secretary.

Bombay, the 23rd July, 1960.

APPENDIX I

(*Vide* Paragraph 3.1)

List of Firms, Bodies and Government Departments to whom the Commission's questionnaires and letters were issued and from whom replies were received

*Indicates those who replied in detail.

†Those who have stated that they are either not interested in the inquiry or are not dealing in the product.

A. *Producers*:

*1. National Electrical Industries Ltd., The Industrial Estate, Lalbaug, Bombay-12.
*2. Crompton Parkinson (Works) Pvt. Ltd., Haines Road, Worli, Bombay-18.
*3. Bharat Bijlee Ltd., Udyog Nagar, Near King Circle Rly. Station, Bombay-22.
*4. Radio Lamp Works Ltd., 45-47, Veer Nariman Road, Bombay-1.
*5. Gandhi Electric Industries Pvt. Ltd., 94, Medows Street, Fort, Bombay-1.
*6. Associated Electrical Industries Mfg. Co. Pvt. Ltd., 1, Taratalla Road, Garden Reach, Calcutta-24.
*7. The General Electric Co. of India Manufacturing Pvt. Ltd., Magnet House, Chittaranjan Avenue, Calcutta-1.
*8. Electric Construction & Equipment Co. Ltd., 9, Kaliprasanna Singhee Road, Calcutta-2.
*9. The India Electric Works Ltd., Diamond Harbour Road, Behala, Calcutta-34.
10. Hindustan Electric Co. Ltd., 184, J. N. Mukherjee Road, Salkia, Howrah, Calcutta.
*11. Hackbridge-Hewittic & Easun Pvt. Ltd., 5-7, Second Line Beach, Madras-1.
*12. Transformer & Switchgear Ltd., Indian Chamber Buildings, Esplanade, Madras-1.
*13. Radio and Electricals Ltd., Post Box No. 730, 38, Mount Road, Madras-6.
*14. Kirloskar Electric Co. Ltd., Post Box No. 1017, Bangalore-3.
*15. Government Electric Factory, Post Box No. 579, Mysore Road, Bangalore-2.
*16. Indian Transformers Ltd., P.O. Box No. 21, Alwaye, Kerala.
*17. Pradip Lamp Works, P.O. Begumpur, Patna.

B. *Producers' Associations* :

*1. Indian Electrical Mfrs. Association, India Exchange (7th Floor), Calcutta-1.
†2. Transformer Mfrs. Association, C/o. M/s. Radio Lamp Works Ltd., 45-47, Veer Nariman Road, Bombay.

Importers :

†1. International General Electric Co. (I) Ltd., Thackersey House, Graham Road, Ballard Estate, Bombay-1.
*2. British Insulated Callenders' Cables Ltd., Esplanade House, Waudby Road, Bombay.

3. General Electric, Co (India) Ltd., Magnet House, Chittarangan Avenue, Calcutta-1.
4. The English Electric Co. Ltd., Post Box No. 752, Bombay.
†5. Ahmedabad Mfg. and Calico Printing Co. Ltd., Post Box No. 12, Ahmedabad.
6. C. A. Parsons and Co. Ltd., Agents : Martin Burn Ltd., 31, Chittaranjan Avenue, Calcutta-12.
†7. Burn & Company Ltd., Reyrolle Agency, 31, Chittaranjan Avenue, Calcutta-12.
8. Easun Engineering Co. Ltd., 2nd Line Beach, Madras.
†9. Parry & Co. Ltd., Mount Road, Madras.
†10. Binny & Co. (Madras) Ltd., Agents: English Electric Co. Ltd., 7, Armenian Street, Madras.
11. Associated Electrical Industries (I) Ltd., Crown House, Mission Row, Calcutta.
*12. Indian Copper Corporation, Ghatsila P.O., Singhbum District, (Bihar), South Eastern Railway.
†13. Marshall Sons & Co. (India) Ltd., Marshalls Building, Ballard Road, Post Box 124, Bombay-1.
*14. Transformer (XTA) Agreement, B 4, Gillander House, Calcutta.
†15. Steam & Mining Equipment (India) Ltd., 101, Park Street, Calcutta-16.
16. Indian Cable Co. Ltd., Esplanade House, Waudby Road, Bombay-1.
17. William Jacks & Co., National Bank of India Building, 1st Line Beach, P.O. Box No. 1282, Madras.
18. Blue Star Engineering Co. (Bombay) Private Ltd., Kasturi Buildings, Jamshedji Tata Road, Bombay-1.

D. *Consumers* :

*1. The Federation of Electricity Undertakings of India, Killick House, Home Street, Fort, Bombay.
*2. The Calcutta Electric Supply Corporation Ltd., Victoria House, Chowringhee Square, Calcutta.
*3. Electricity Supply Undertakings, Managing Agents : Martin Burn Ltd., 12, Mission Row, Calcutta.
4. The Association of Electricity Supply Companies, Uttar Pradesh, C/o. Martin Burn Ltd., 12, Mission Row, Calcutta.
5. The Association of Electricity Undertakings, Bengal, Victoria House, Calcutta.
6. The Association of Electricity Undertakings of Bihar and Orissa, C/o. Octavious Steel and Co. Ltd., 14, Old Court House Street, Calcutta.
7. The South Madras Electric Supply Corporation Ltd., Tiruchirappalli, South India.
*8. Madhya Pradesh Electricity Board, Rampur, Jabalpur.
*9. Mysore State Electricity Board, Office of the Chief Engineer, Electricity, Post Box No. 15, Bangalore-1.
*10. Kerala State Electricity Board, Post Box No. 65, Trivandrum.
*11. Chief Engineer, Electricity, Govt. of Orissa, Puri, Orissa State.
12. The Chief Engineer, Bombay State Electricity Board, Mercantile Bank Building, Mahatma Gandhi Road, Bombay.
*13. Kanpur Electricity Supply Administration, (U.P. State Electricity Board 'Kesa House' 14/71, Civil Lines, Kanpur.

*14. Damodar Valley Corporation, Anderson House, Alipore, Calcutta-27.
*15. The Tata Hydro-Electric Power Supply Co. Ltd., Bombay House, Bruce Street, Bombay-1.
*16. B. E. S. T. Undertaking, Best House, Post Box No. 192, Bombay-1.
17. The Superintending Engineer (Distribution), Madras Electric System, 157, Mount Road, Madras.
18. The Chief Engineer, Andhra Pradesh State Electricity Board, Khairadabad, Hyderabad, Andhra Pradesh.
19. The Superintending Engineer, Hydel Ganga Circle, Roorkee.
20. The Chief Engineer, East Punjab P.W.D., Electricity Branch, Simla.
*21. Killick Industries Ltd., Managing Agents for Central Administration Department, 5, Graham Road, (4th Floor), Ballard Estate, Bombay.
*22. Octavious Steel and Co., P. B. No. 38, Calcutta.
23. Andrew Yule & Co., 8, Clive Row, Calcutta.

E. *Raw Material Suppliers* :

(a) *Electrical Stampings*

*1. Sankey Electrical Stampings Pvt. Ltd., Post Box No. 121-A, Bombay.
*2. Devidayal Stainless Steel Industries Pvt. Ltd., P.O. Box 6224, Darukhana. Reay Road, Bombay-10.

(b) *Electrical Steel Sheets*

*1. The Tata Iron & Steel Co. Ltd., Bombay House, 24, Bruce Street, Bombay-1.

(c) *Copper Strips and Wires*

*1. National Insulated Cable Co. of India Ltd., NICCO House, 2, Hare Street, Calcutta.
*2. Indian Cable Co. Ltd., 9, Hare Street, Calcutta.
*3. Devidayal Cable Industries Pvt. Ltd., Gupta Mills Estate, Darukhana, Reay Road, Bombay-10.
*4. Shri Shakti Trading Co., Bansilal Motilal Mansion, 22, Appollo Street, Bombay.

(d) *Porcelain Bushings*

*1. Government Porcelain Factory, Malleswaram P.O., Post Box No. 4, Bangalore.
*2. Bengal Potteries Ltd., 45, Tangra Road, Calcutta.
*3. Bengal Porcelain Co. Ltd., 1/2, Motisil Street, Calcutta-13.
*4. Hindusthan Potteries, 12, Shib Kristo Daw Lane, Calcutta-7.

(e) *Cooling Tubes*

*1. Premier Automobiles Ltd., Agra Road, Kurla, Bombay.
2. Indian Tube Co. (1953) Ltd., Tatagagar.
*3. Tube Products of India, Avadi, Near Madras.
†4. Godrej and Boyce Mfg. Co. Ltd., Lalbaug, Bombay.

(f) *Government Departments*

*1. The Senior Industrial Adviser, Development Wing, Ministry of Commerce and Industry, Udyog Bhavan, Maulana Azad Road, New Delhi.
*2. The Director, Indian Standards Institution, Manak Bhavan, Mathura Road, New Delhi.
*3. The Member (Utilisation), Central Water and Power Commission (Power Wing), Ministry of Irrigation & Power, Government of India, New Delhi.
*4. The Collector of Customs, Bombay.

†5. The Collector of Customs, Calcutta.
*6. The Collector of Customs, Madras.
†7. The Collector of Customs, Cochin.
*8. Iron & Steel Controller, 33, Netaji Subhas Road, Calcutta.
*9. The Director of Industries and Statistics Authority, Government of Bombay, Bombay.
*10. The Director of Industries, Government of Madras, Madras.
*11. The Director of Industries, Government of West Bengal, Calcutta.
*12. The Director of Industries and Commerce, Government of Mysore, Bangalore.
*13. The Director of Industries and Commerce, Government of Kerala, Trivandrum.
*14. Counsellor (Commercial) to the High Commission of India in U.K., 'India House', Aldwych, London (U.K.).
15. First Secretary (Commercial) to the Embassy of India, 262, Koblenzostrasse, Bonn (West Germany).
16. First Secretary (Commercial) to the Embassy of India, (Via) Francisco, Denze 36, Rome (Italy).
*17. First Secretary (Commercial) to the Embassy of India, Embire House (Naigi Building), Maruneachi, Tokyo (Japan).

STATE GOVERNMENTS :

1. The Chief Secretary to the Government of Assam, Shillong.
*2. The Chief Secretary to the Government of Uttar Pradesh, Lucknow.
3. The Chief Secretary to the Government of Bihar, Patna.
*4. The Chief Secretary to the Government of Orissa, Bhubaneshwar.
*5. The Chief Secretary to the Government of Kerala, Trivandrum.
†6. The Chief Secretary to the Government of Punjab, Chandigarh.
7. The Chief Secretary to the Government of Andhra Pradesh, Hyderabad.
8. The Chief Secretary to the Government of Madras, Madras.
9. The Chief Secretary to the Government of Madhya Pradesh, Bhopal.
10. The Chief Secretary to the Government of Rajasthan, Jaipur.
11. The Chief Secretary to the Government of Jammu & Kashmir, Srinagar.
*12. The Chief Secretary to the Government of Mysore, Bangalore.
13. The Chief Secretary to the Government of Bombay, Bombay.
14. The Chief Secretary to the Government of West Bengal, Calcutta.
15. The Chief Commissioner, Delhi.
16. The Chief Commissioner, Himachal Pradesh, Simla.

APPENDIX II

(*Vide* Paragraph 3·2)

Statement showing the factories visited by the Commission and other Officers.

Sl. No.	Name of the factory visited	By whom visited	Date of visit
1	2	3	4
1	National Electrical Industries Ltd., Bombay.	Shri K. R. P. Aiyangar, Chairman and Shri J. N. Dutta and Shri R. S. Bhatt, Members.	26th March, 1960.
		Shri Hari Bhushan, Technical Director (Engineering & Metallurgy) and Shri C. S. Ambady, Research Officer (Engineering).	23rd December, 1959.
2	Crompton Parkinson (Works) Private Ltd., Bombay.	Shri K. R. P. Aiyangar and Dr. S. K. Muranjan and Shri R. S. Bhatt, Members.	4th April, 1960.
		Shri B. R. Sehgal, Director (Investigations) and Shri Hari Bhushan.	2nd February, 1960.
3	Bharat Bijlee Ltd., Bombay.	Shri K. R. P. Aiyangar, Shri J. N. Dutta and Shri R. S. Bhatt.	26th March, 1960.
4	Sankey Electrical Stampings (P) Ltd., Bombay.	Shri K. R. P. Aiyangar, Shri J. N. Dutta, Shri R. S. Bhatt and Dr. Rama Varama, Secretary.	15th March, 1960.
		Shri B. R. Sehgal, Shri Hari Bhushan and Shri C. S. Ambady.	11th March, 1960.
5	Kirloskar Electric Co. Ltd., Bangalore.	Shri K. R. P. Aiyangar.	26th April, 1960.
		Dr. S. K. Muranjan and Shri R. S. Bhatt.	2nd May, 1960.
		Shri C. S. Ambady.	15th April, 1960.
6	Government Electric Factory, Bangalore.	Shri K. R. P. Aiyangar.	26th April, 1960.
		Dr. S. K. Muranjan and Shri R. S. Bhatt.	3rd May, 1960.
7	Government Porcelain Factory, Bangalore.	Shri K. R. P. Aiyangar.	27th April, 1960.
		Dr. S. K. Muranjan and Shri R. S. Bhatt.	3rd May, 1960.
8	Sankey Electrical Stampings (P) Ltd., Bangalore.	Shri K. P. R. Aiyangar.	26th April, 1960.
		Dr. S. K. Muranjan and Shri R. S. Bhatt.	4th May, 1960.
9	Hackbridge-Hewittic and Easun Private Ltd., Madras.	Shri K. R. P. Aiyangar.	29th April, 1960.
		Shri Hari Bhushan.	15th March, 1960.
		Shri C. S. Ambady.	11th January, 1960.
10	Radio and Electricals Ltd., Madras.	Shri K. R. P. Aiyangar.	30th April, 1960.

APPENDIX II—*Contd.*

1	2	3	4
11	Transformer & Switchgear Ltd., Madras.	Shri K. R. P. Aiyangar. Shri C. S. Ambady . .	29th April, 1960. 9th January, 1960.
12	Electric Construction & Equipment Co. Ltd., Calcutta.	Dr. S. K. Muranjan. Shri J. N. Dutta and Shri Hari Bhushan.	18th March, 1960. 9th February, 1960.
13	Associated Electrical Industries Mfg. Co. Ltd., Calcutta.	Shri J. N. Dutta and Shri Hari Bhushan.	11th February, 1960.
14	India Electric Works, Calcutta.		

APPENDIX III

(*Vide* Paragraph 3·4)

List of persons who attended the Commission's public inquiry on 12th May, 1960.

Name of the Representative		Name of firm or body
1		2
(A) PRODUCERS :		
1. Shri S. Szafranski . . .	Representing	National Electrical Industries Ltd., The Industrial Estate, Lalbaug, Bombay-12. AND Indian Electrical Manufacturers' Association, India Exchange (7th floor). Calcutta-1.
2. Shri D. K. Sinha . . .	,,	Indian Electrical Manufacturers' Association, India Exchange (7th floor), Calcutta-1.
3. Shri S. G. Ramachandra 4. Shri P. R. Mundewadi .	,,	Kirloskar Electric Co. Ltd., Post Box No. 1017, Bangalore-3.
5. Shri K. Eswaran . . .	,,	Hackbridge-Hewittic & Easun Private Ltd., 5-7, Second Line Beach, Madras-1.
6. Shri V. V. Dhume . . 7. Shri U. K. Patwardhan .	,,	Crompton Parkinson (Works) Private Ltd., Haines Road, Worli, Bombay-18.
8. Shri M. L. Lakhotia . .	,,	Electric Construction & Equipment Co. Ltd., 9, Kaliprasanna Singhee Road, Calcutta-2.
9. Shri N. Subramaniam . .	,,	Transformer & Switchgear Ltd., Indian Chamber Bldgs., Esplanade, Madras-1.
10. Shri P. C. Mehta . . . 11. Shri J. S. Zaveri . .	,,	Bharat Bijlee Ltd., Udyog Nagar, Near King's Circle Railway Station, Bombay-22.
12. Shri P. H. Gidwani . . 13. Shri B. V. Tolani . . .	,,	Radio Lamp Works Ltd., 45-47, Veer Nariman Road, Bombay-1.
14. Shri V. Rama Rao . .	,,	Radio & Electricals Ltd., Post Box No. 730, 38, Mount Road, Madras-6.
15. Shri S. P. Divgi . . .	,,	Associated Electrical Industries Manufacturing Co. Private Ltd.,1, Taratalla Road,Garden Reach, Calcutta-24.

1		2
16. Shri C. D. Gandhi	Representing	Gandhi Electric Industries Private Ltd., 94, Medows Street, Fort, Bombay-1.
17. Mr. P. H. Hipwell	„	The General Electric Co. of India Mfg. Pvt. Ltd., Magnet House, Chittaranjan Avenue, Calcutta-1.
(B) IMPORTER:		
18. Mr. K. Patterson.	„	Transformer (XTA) Agreement B-4, Gillander House, Calcutta.
(C) CONSUMERS :		
19. Shri P. N. Mukherji	„	Damodar Valley Corporation, Anderson House, Alipore, Calcutta-27.
20. Shri G. Sambasiviah	„	Mysore State Electricity Board, Office of the Chief Engineer, Electricity, Post Box No. 15, Bangalore-1.
21. Shri J. D. Chothia	„	Tata Hydro-Electric Power Supply Co. Ltd., Bombay House, Bruce St., Bombay-1.
22. Shri K. Matthan	„	B. E. S. T. Undertaking, BEST House, P. B. No. 192, Bombay-1.
23. Shri N. P. Kirpalani 24. Shri M. J. A. D' Lima	„	Killick Industries Ltd., 'Managing Agents for Central Administration Department, 5, kradham Road, (4th floor), Ballard Estate, Bombay.
(D) SUPPLIERS OF RAW MATERIALS:		
25. Shri V. S. Deshpande 26. Shri N. R. Banerjee 27. Mr. F. R. Ladyman	„	Sankey Electrical Stampings, Pvt. Ltd., Post Box No. 121-A, Bombay.
28. Mr. K. R. Stones	„	Indian Cable Co. Ltd., 9, Hare Street, Calcutta. AND British Insulated Callenders', Cables Ltd., Esplanade House, Waudby Road., Bombay.

1		2
29. Shri K. J. Cleetus . .	Representing	Tata Iron & Steel Co. Ltd., Bombay House, Bruce Street, Bombay-1.
30. Shri S. S. Vaze . . .		
31. Shri S. K. Shah . . .	,,	Premier Automobiles Ltd., Agra Road, Kurla, Bombay.
32. Shri M. C. Thakore . .	,,	Shri Shakti Trading Co., 22, Apollo Street, Fort, Bombay-1.
(E) GOVERNMENT OFFICIALS :		
33. Shri K. N. Ramaswamy, Development Officer (Electricals)	,,	Development Wing, Ministry of Commerce & Industry, New Delhi.
34. Shri H. R. Kulkarni, Deputy Director.	,,	Central Water & Power Commission (Power Wing), Ministry of Irrigation and Power, Government of India, New Delhi.
35. Lt. Col. O. G. Eapen, Dy. Iron & Steel Controller	,,	Iron & Steel Controller, 33, Netaji Subhas Road, Calcutta.
36. Shri A. B. Rao, Assistant Director.	,,	Indian Standards Institution, Manak Bhavan, Mathura Road, New Delhi.
37. Shri B. M. Saifulla, Jt. Director of Industries.	,,	The Director of Industries, Government of Mysore, Bangalore.
38. Shri D. S. Godbole, Deputy Director.	,,	The Director of Industries, Government of Maharashtra, Bombay.

APPENDIX IV

(*Vide* Paragraph 6·1)

Statement showing particulars about units manufacturing transformers

Sl. No.	Name of unit	Nature of company	Name of Managing Agents, if any	Name of foreign collaborator, if any	Paid-up Capital		Articles other than Power and Distribution Transformers manufactured	Average number of workers employed during		
					Amount	As on		1957	1958	1959
					(In lakhs of Rupees)					
	Crompton Parkinson (Works) Private Ltd.	Private Limited	..	Technical Service Agreement with Parent Company, Crompton Parkinson Ltd., London.	107·38	30-6-59	Motor Control Gear, Switchgear, Electric Motors, etc.	521	473	343
	Associated Electrical Industries Mfg. Co. Private Ltd.	Private Limited	..	As a member of A.E.I., group of companies, receives technical assistance from the associated companies in the U.K.	25·00	31-10-59	Motors, Starters, Isolating Switchgear and connections, M. C. Switchfuse Units, Lighting Equipment, Traction Equipment, Melting and Heat Treatment Furnaces.	263	263	225

	National Electrical Industries Ltd.	Public Limited	Navin, Kumar, Hansraj (Private) Ltd.	Nil	13·30	31-3-59	Electric Motors, Bench and Pedestal Grinders, Monobloc Turbine Pumps and Loom Switches.	361	361	361
4	Government Electric Factory, Bangalore.	Government Undertaking	..	A.E.G. of West Germany	82·25 (Government Capital)	31-3-59	Motors, Switchgears and Switch Boards.	303	303	303
5	Radio Lamp Works Ltd.	Public Limited	Jamnalal Sons Private Ltd.	Nil	34·11	31-3-59	Electrical Measuring Transformers, Fittings and Chokes for Fluorescent Tubes and Electric Lamps.	287	168	127
6	Radio & Electricals Ltd.	Do.	..	Nil	15·00	31-12-58	Nil	116	101	83
7	Electric Construction and Equipment Co. Ltd.	Do.	..	Tokyo Schibaura, Japan.	30·63	31-10-59	Switchgears, Oil Circuit Breakers, Air Brake Switches and Motors.	350	350	370
8	Gandhi Electric Industries Pvt. Ltd.	Private Limited	..	Nil	N.A.	.	Nil	23	22	24
9	General Electric Co. India (Mfg.) Pvt. Ltd.	Do.	..	General Electric Co. Ltd., England.	N.A.	..	Electric Fans, Electric Motors, Switch and Control Gear, House Service Meters, Radio Receivers and domestic appliances.	86	66	70

APPENDIX IV—*Contd.*

Sl. No.	Name of unit	Nature of company	Name of Managing Agents, if any	Name of foreign collaborator, if any	Paid-up Capital		Articles other than Power and Distribution Transformers manufactured	Average number of workers employed during		
					Amount	As on		1957	1958	1959
					(In lakhs of Rupees)					
10	Kirloskar Electric Company Ltd.	Public Limited	Kirloskar Associates	Hawker Siddeley Industries Ltd., Loughborough, (U.K.), formerly Brush Electrical Engg. Co. Ltd.	39·38	30-6-59	Electrical Equipment such as Electric Motors, Alternators, etc.	146	150	148
11	Hindustan Electric Co. Ltd.	Do.	Dharmsinh & Co., Bombay.	Nil	60·00	30-4-59	Electric Motors, Cables, Machine Tools, Switchgear, etc.	200	222	257
12	Bharat Bijlee Ltd.	Do.	..	Siemens Engg. & Mfg. Co. of India Private Ltd. who have got manufacturing rights from Siemens Schuckertwerke, AG., W. Germany.	10·00	30-6-58	All types of A.C. 3 phase induction motors.	73	77	115
13	Hackbridge-Hewittic & Easun Pvt. Ltd.	Private Limited	..	Hackbridge & Hewittic Electric Co. Ltd., of U.K.	4·90	31-1-59	Nil	58	68	85

14	India Electric Works Ltd.	Public Limited	..	Nil	25·00	30-3[illegible]	Electric Fans, Motors, Railway Signalling and Train Lighting Equipments.	72	72	72
15	Transformer & Switchgear Ltd.	Public Limited	..	Dominitworke, Hoppecke, Germany.	5·00	31-12-58	Air Brake Switches	52	60	83
16	Indian Transformers Ltd.	Do.	..	Partidge Transformers Ltd., England.	NA.	..	Nil	35	33	26
							TOTAL .	2,946	2,789	2,692

APPENDIX V

(*Vide* Paragraph 7)

I. *Statement showing the production of three phase Transformers*

	1957		1958		1959	
	Number	KVA	Number	KVA	Number	KVA
Upto 3·3 KV						
Upto 25 KVA	14	258	50	710	34	5·0GA
Above 25 to 75 KVA	84	4,309	81	3,840	14	[illegible]750
Above 75 to 250 KVA	92	15,465	127	16,109	26	5,025
Above 250 to 500 KVA	44	17,900	47	20,700	25	9,400
Above 500 to 1000 KVA	12	8,600	22	17,000	4	3,350
Above 1000 to 1500 KVA	2	2,450	3	4,000	..	..
Above 1500 to 3000 KVA	2	4,000	1	2,000	2	4,000
Above 3000 KVA	..	..	..	..	..	..
TOTAL	250	52,982	331	64,359	105	23,329
Above 3·3 *to* 6·6 KV						
Upto 25 KVA	175	3,605	104	2,105	33	795
Above 25 to 75 KVA	67	3,864	53	2,800	72	3,570
Above 75 to 250 KVA	222	35,858	247	37,750	136	21,225
Above 250 to 500 KVA	110	48,500	76	33,250	49	20,550
Above 500 to 1000 KVA	60	48,250	50	37,350	38	30,100
Above 1000 to 1500 KVA	3	4,500	1	1,500	7	10,500
Above 1500 to 3000 KVA.	..	..	1	2,000	1	2,000
Above 3000 KVA	..	..	..	..	..	..
TOTAL	637	144,577	532	116,755	336	88,740
Above 6·6 *to* 11 KV						
Upto 25 KVA	2,153	40,800	2,082	44,930	2,407	46,170
Above 25 to 75 KVA	3,295	1,48,248	2,979	1,28,328	2,069	1,17,037
Above 75 to 250 KVA	2,249	3,00,975	1,405	1,89,739	1,337	1,74,750
Above 250 to 500 KVA	381	1,59,200	394	1,63,665	239	1,01,535
Above 500 to 1000 KVA	167	1,36,500	166	1,35,725	113	96,152
Above 1000 to 1500 KVA	7	10,000	24	39,100	14	21,000
Above 15000 to 3000 KVA	6	13,200	2	4,000	9	17,900
Above 3000 KVA	1	5,000	..	..	1	4,000
TOTAL	8,259	8,13,923	7,052	7,05,487	6,189	578,544

APPENDIX V—*Contd.*

	1957		1958		1959	
	Number	KVA	Number	KVA	Number	KVA
22 KV						
Upto 25 KVA	146	3,220	303	5,880	366	7,205
Above 25 to 75 KVA	437	25,075	253	14,575	166	8,425
Above 75 to 250 KVA	568	61,425	323	35,150	148	18,300
Above 250 to 500 KVA	17	7,700	12	4,600	7	2,700
Above 500 to 1000 KVA	19	15,850	14	11,050	7	5,950
Above 1000 to 1500 KVA	..	..	2	2,750	2	3,000
Above 1500 to 3000 KVA	2	3,750	..	..	2	4,000
Above 3000 KVA	..	..	..	..	..	..
TOTAL	1,189	117,020	907	74,005	699	49,580
33 to 37·5 KV						
Upto 25 KVA	4	100	9	185	9	150
Above 25 to 75 KVA	10	550	2	100	..	..
Above 75 to 250 KVA	38	4,350	36	5,000	38	5,300
Above 250 to 500 KVA	31	13,100	40	16,650	61	53,150
Above 500 to 1000 KVA	12	11,500	13	11,750	25	21,500
Above 1000 to 1500 KVA	5	7,500	2	3,000	2	3,000
Above 1500 to 3000 KVA	36	58,500	49	136,450	72	167,900
Above 3000 KVA	..	..	..	..	..	..
TOTAL	136	95,600	151	1,73,135	207	2,51,000
Above 37·5 KV						
Upto 25 KVA	..	..	..	..	..	..
Above 25 to 75 KVA	..	..	..	..	..	..
Above 75 to 250 KVA	..	..	..	..	..	..
Above 250 to 500 KVA	..	..	6	2,400	2	1,000
Above 500 to 1000 KVA	..	..	2	1,500	5	4,000
Above 1000 to 1500 KVA	..	..	..	..	..	..
Above 1500 to 3000 KVA	..	..	4	7,500	23	48,500
Above 3000 KVA	..	..	1	5,000	1	5,000
TOTAL	..	..	13	16,400	31	58,500
GRAND TOTAL	10,471	1,224,102	8,986	1,150,141	7,567	1,049,693

APPENDIX V—*Contd.*

II. *Statement showing the production of single phase transformers*

	1957		1958		1959	
	Nos.	KVA	Nos.	KVA	Nos.	KVA
Upto 3·3 KV						
Upto 25 KVA . .	5	14	43	572	92	14
Above 25 to 75 KVA .	..	..	..	..	2	60
Above 3·3 *to* 6·6 KV						
Upto 25 KVA . .	..	..	1	10	1	5
Above 75 to 250 KVA	..	..	1	150	2	400
Above 6·6 *to* 11 KV						
Upto 25 KVA . .	135	1,182	277	2,031	181	930
33 *to* 37·5 KV						
Upto 25 KVA . .	..	..	2	10	..	..
TOTAL .	140	1,196	324	2,773	278	1,409


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