# THIRTY-FIRST REPORT

# COMMITTEE ON PUBLIC UNDERTAKINGS (1986-87)

(EIGHTH LOK SABHA)

## BHARAT ELECTRONICS LIMITED—OBJECTIVES & IMPLEMENTATION OF PROJECTS

## (MINISTRY OF DEFENCE, DEPARTMENT OF DEFENCE PRODUCTION & SUPPLIES)

**Action Taken by Government on the recommendations contained in the 9th Report of the Committee on Public Undertakings (Eighth Lok Sabha) ]**

*Presented to Lok Sabha on* 30 April, 1987
*Laid in Rajya Sabha on* 30 April, 1987

LOK SABHA SECRETARIAT

NEW DELHI

*April, 1987/Vaisakha, 1909 [Saka]*

**Price : *Rs.* 4.00**

Corrigenda to the Thirty-first Report of Committee on Public Undertakings (1986-87) on Bharat Electronics Ltd. - Objectives and Implementation of Projects.

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## (1986-87)

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## ACTION TAKEN SUB-COMMITTEE OF THE COMMITTEE ON PUBLIC UNDERTAKINGS
(1986-87)

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## INTRODUCTION

I, the Chairman, Committee on Public Undertakings having been authorised by the Committee to submit the Report on their behalf, present this 31st Report on Action Taken by Government on the recommendations contained in the 9th Report of the Committee on Public Undertakings (Eighth Lok Sabha) on Bharat Electronics Limited—Objectives and Implementation of Projects.

2. The 9th Report of the Committee on Public Undertakings was presented to Lok Sabha on 29 April, 1986. Replies of Government to all the recommendations contained in the Report were received by 13 April, 1987. The replies of Government were considered by the Action Taken Sub-Committee of the Committee on Public Undertakings on 24 April, 1987. The Committee also considered and adopted this Report at their sitting held on 24 April, 1987.

3. An analysis of the action taken by Government on the recommendations contained in the 9th Report (1985-86) of the Committee is given in Appendix VIII.

NEW DELHI;
*April* 29, 1987
*Vaisakha* 9, 1909 (*S*)

K. RAMAMURTHY
*Chairman,*
*Committee on Public Undertakings.*

## CHAPTER I

## REPORT

The Report of the Committee deals with the action taken by Government on the recommendations contained in the Ninth Report (Eighth Lok Sabha) of the Committee on Public Undertakings on Bharat Electronics Ltd. which was presented to Lok Sabha on 29 April, 1986.

2. Action Taken Notes have been received from Government in respect of all the 32 recommendations contained in the Report. These have been categorised as follows:—

(i) *Recommendations/observations that have been accepted by Government*

Sl. Nos. 1—4, 6—10, 17—20, 25, 30 and 31.

(ii) *Recommendations/observations which the Committee do not desire to pursue in view of Government's replies*

Sl. Nos. 5, 11, 21—24, 29 and 32.

(iii) *Recommendations/observations in respect of which replies of Government have not been accepted by the Committee.*

Sl. Nos. 12, 13, 14—16 and 26—28.

3. The Committee will now deal with the action taken by Government on some of their recommendations.

A. *Diversification Programme of Ghaziabad Unit*

**Recommendation (Sl. Nos. 12 and 13, Paragraph Nos. 3.67 to 3.69)**

4. The Committee had expressed their concern over the delay of two years and omission of specific time schedule in the scheme of diversification programme for balancing Ghaziabad Unit. The Company had only envisaged targets of production and investment without any time schedule. Although the diversification scheme was to be launched in 1975-76, a beginning was made only in 1976-77 and the Unit could not make any headway in achieving the increased production. None of the items transferred from Bangalore Unit had been firmly established in regular production line prior to

transfer. Out of the five items planned, one meant for defence did not reach the production stage as the development project itself was abandoned. Another item under development at Bangalore Unit was not transferred but productionised there itself. The production of remaining three items commenced only in 1978. Even the representative of BEL admitted in evidence before the Committee that "decision to transfer certain equipment to Ghaziabad proved wrong because of certain compulsions of the product-mix at Ghaziabad Unit changing." Considering it a clear case of lapse, the Committee had recommended that the matter should be enquired into with a view to fixing responsibility.

5. The Government in their reply have stated that as most of the products transferred from Bangalore for production in Ghaziabad were new, the Company ran into many technical snags which could not be anticipated at the time the diversification programme was drawn up. The Government have also stated that the study of the circumstances and the manner in which diversification programme was implemented has revealed that it was due to the circumstances beyond human control as a result of which the delay occurred. They have felt that an enquiry to fix responsibility is unlikely to bear any fruitful results.

**6. The Committee are not satisfied with the reply of the Government and have gathered the impression that the Government is trying to cover up the delay under the pretext of technical snags. The Committee reiterate their earlier recommendation for the setting up an independent enquiry to bring out the facts. The Committee recommend that enquiry may be conducted without any further delay and the Committee apprised of the result within 3 months.**

B. *Supply of UHF Radio Relay Equipments to P&T Departments*

**Recommendation (Sl. Nos. 14, 15 and 16, Paragraph Nos. 3.70 to 3.74)**

7. The Committee have noticed that the P&T Department placed orders for 80 bays of UHF Radio Relay Equipments with BEL in May 1974 and later on increased its order to 104 in November, 1976 at the instance of BEL. As per terms of agreement, the delivery was to commence within 6 months from the date of placement of order and to be completed within 18 months i.e. by November, 1975. The equipment was originally to be manufactured in Bangalore Unit where it was designed and developed but it was transferred

to Ghaziabad Unit in July, 1975, under the scheme of balancing Ghaziabad Unit much against the wishes of P&T Department as they apprehended delay. The equipment did not meet the specifications and created reliability problem when installed. Due to inability of BEL to manufacture the equipment according to original specification, P&T Department short closed their orders upto 58 bays and resorted to import to meet their immediate requirements.

8. The Committee had also been informed that by 1979 BEL could not supply even 30 bays and wanted to increase the price over 260 per cent *i.e.* to Rs. 2.55 lakhs per bay against the original agreed rate of Rs. 0.97 lakh per bay. The Committee had not appreciated the failure of BEL to meet price and quality requirement of P&T Department. The Committee had also not appreciated the reaction of P&T Department for short closing the orders and going in for import specially when their technical Director had examined and stated that equipment conformed to specifications.

9. The Committee had also pointed out in Para 3.73 that in terms of instruction issued by Government in 1972, the Company should have made a thorough analysis of demand and cost of production before undertaking manufacture of new item so as to minimise the losses. But the Company embarked on the venture for the manufacture of UHF Radio Relay Equipment unsuccessfully and incurred huge losses. The Committee had therefore recommended thorough investigation of the whole matter with regard to fixing of the responsibility.

10. In reply, the Government have stated that there was a close coordination between the Development Wings of P&T and BEL in the design and development of the equipment. The defects that came up during the course of development and producton were indeed attended to, in association with the P&T. On the price aspect it has stated that reasonably accurate estimates could not unfortunately be made at the initial stage when orders were sought. The supply of the equipment to the P&T had to be short-closed at a point of time when it was determined that the specifications were required to be improved upon and the designs could not cater to this new need. Thus, P&T's resort to imports could also perhaps not be avoided from the operation angle.

11. As regards the losses suffered by the Company, the Government have stated that in such development and production programmes, at times the commercial results may not be always viable and satisfactory. Viewed in totality, holding an enquiry into

this matter is unlikely to reveal anything new or pin-point an individual whose actions or decisions directly or indirectly resulted in some loss to the Company.

**12. The Committee are not convinced with the Government's reply. No new grounds have been advanced to justify the delay in the supply of equipment resulting in closing of orders by P&T, due to which the Company suffered heavy losses. The Committee, therefore, reiterate their original recommendation and recommend that the whole issue may be thoroughly investigated with a view to fixing responsibility. The enquiry may be conducted by an independent body free from any internal pulls and pressures. The result of the enquiry may be communicated to the Committee within 3 months.**

C. *Production of Integrated Circuit (ICs)—Collaboration agreement with Radio Corporation of America (RCA)*

**Serial Nos. 26 to 28 (Paragraphs Nos. 3.157 to 3.161)**

13. The Committee had found that the board of Directors of BEL decided in December, 1969 that BEL should enter into the field of ICs from technological angle though market-wise the demand for these devices was very modest. Accordingly, the demand of ICs was calculated by BEL on the basis of requirement of ECIL and ITI, the two main professional manufacturers who were then told of the range of ICs being manufactured by BEL. The ECIL and ITI accordingly, indicated their quantity and the time frame which formed the basis for acquiring designs know how from RCA, the development plans of ECIL and ITI did not materialise as the same were overtaken by the latest advanced developments, the demand expectation also did not materialise.

14. In order to acquire the design and production information in respect of families of ICs, BEL explored the possibilities of acquiring technology from Japan and other leading companies in USA. But none of them was prepared to share their technology and only M/s. Radio Corporation of America (RCA) which was not the foremost company in the world agreed to respond. BEL entered into collaboration agreement with RCA in 1971 for a period of 10 years The agreement expired in April, 1981 but was extended further upto December, 1990.

15. The Committee have also found that ICs produced with collaboration of RCA were of very elementary level of technology and covered medium scale integration (5000 to 10,000 circuits in a

single chip) whereas currently the technology has advanced tremendously in this field and in that very large scale (VISI) and very very large scale (VVISI) chips with several million circuits in a single chip, are being produced in the world.

16. As the ICs produced by BEL were not much in demand, it resulted in the accumulation of huge stock by the end of 1984. On the other hand, BEL was depending on imports for its own in-house requirements. Accordingly, the Committee had also remarked that when the very basis of the strength of collaboration agreement entered with RCA had changed, the Company should have explored the possibility of acquiring the latest technology for ICs from Japan or other source in USA before extending agreement for a further period of 10 years on its expiry in 1981. Accordingly, the Committee had recommended that the whole issue as to how the Collaboration Agreement with RCA was originally entered into and why the agreement was extended when the technology available from them was not proving to be of any material help should be examined by an independent body.

17. The Government in their reply have stated that the original agreement with RCA was entered into by the Company based on the technology consideration after an assessment by a High Level Technical Committee headed by the then Scientific Adviser, Dr. S. Bhagavantham. The IC technology was an emerging area at that point of time as a technology leap over the discrete devices and the Company had rightly felt that it should also enter this realm of technology. The Company has also pointed out that even at the time of entering into the agreement, the Company's Board had noted that IC project was essential from the technological angle and the total Semiconductors operation of the Company would be required to be viewed as a whole, from viability point of view. Therefore, it would not be correct to state that the technology available from RCA was not of material help. It has also been stated by Government this extension in the agreement has enabled the Company to bring out new types of devices such as those required for other Television Receivers.

18. The Government have also stated that the enquiry into the collaboration agreements is hardly likely to come to any conclusion which could serve as a guideline or yardstick for future collaborative arrangements.

**19. The Committee are not convinced of the Government reply. The Committee have gathered the impression that the Government is trying to avoid the issue of holding an enquiry into collaboration agreements with RCA on arguments which are not very valid. The Committee desire that the Government should not arrive at any conclusion as to the futility of the enquiry before actually holding it. The Committee, therefore, reiterate their earlier recommendation with regard to the holding of an enquiry as to the collaboration agreements entered with RCA by BEL. The Committee would like to be apprised of the result of the enquiry within 3 months of the presentation of this report.**

## CHAPTER II

## RECOMMENDATIONS THAT HAVE BEEN ACCEPTED BY GOVERNMENT

**Recommendation (Serial No. 1, Paragraph Nos. 2.25 to 2.27)**

The Committee note that in pursuance of the recommendation of the Administrative Reforms Commission (ARC), the Bureau of Public Enterprises (BPE) had asked the Government Companies as far back as in November 1970 to initiate action to have objectives and obligation of Public Undertakings under them laid down in consultation with the Ministry of Finance. Again, in 1979, BPE issued further instructions to the Ministries to advise their Public Undertakings to formulate micro objectives consistent with broad objectives spelt out in Industrial Policy Statement of December 1977. The Committee find from the Audit Report that in pursuance of this directive, Bharat Electronics Ltd., (BEL) forwarded a note to BPE in November, 1979 with a copy to the Ministry of Defence (Department of Defence Production) detailing a Corporate Plan, (policy objectives), micro objectives along with a Corporate Plan, without getting them approved by their Board of Directors.

From the facts placed before them the Committee find that the Department of Defence Production and Supplies considering the objectives framed by the Company being of short term nature only had communicated to the Company in December, 1979 their observations on the Corporate Plan objectives framed by the Company. These were placed by the Company before the Board of Directors for consideration only in May, 1983 and were got approved by Board.

The Committee are unhappy over the inordinate delay of nearly three and a half years on the part of the Company in getting their objectives and obligations approved by the Board of Directors. What is worse is that the Company instead of improving upon the objectives and obligations in the light of comments of the Ministry of Defence of December 1979, got the objectives and obligations as originally framed by them approved by their Board of Directors in May 1983. The Committee are surprised that after giving their comments, the Ministry never followed up with the Company to

know the progress made or the final outcome. The Committee believe that objectives and obligations of each Company have to be approved by the administrative Ministry.

If that be so, it is but necessary that the objectives and obligations as approved by the Board of Directors should be submitted to the Ministry and got cleared by them so that the areas of operations are clearly known to the Company and it is able to draw its programmes and activities on those lines and execute them in a time bound programme. A copy of the objectives and obligations has also to be sent to the Ministry of Industries (DPE).

**Reply of the Government**

The Corporate Plan was submitted by the Company in November, 1979 anticipating that it would be possible to get approval within a short time for the 2 new equipment factories which were proposed in the Plan and which had been cleared by the Expenditure Finance Committee of the Government during mid 1979. The proposal for the third factory for which the licence agreement with M/s Corning had also been concluded had also been submitted for approval.

During the year 1980-81, certain exercises pertaining to long Term Planning of Services' requirements were being held in the Ministry of Defence and the methodology pertaining to indigenous development/production were being considered. However since the Defence Services requirements apparently took time to get formulated, the company decided to place before the Board the Corporate Plan as had been prepared in November 1979 for their approval and the Board was informed that the revised Plans would be worked out when decisions pertaining to the three new projects sent to the Government for capacity augmentation were available.

The final approval for these projects were accorded in September 1982 and October 1982. The chronology of events justifying the time taken in processing the case for sanction were made available to the Hon'ble Members of COPU at the time of oral evidence. For drawing up a revised perspective Plan, certain inputs pertaining to the Defence Plans were needed and were considered necessary. It would be relevant to quote here the Defence Ministry's comments given in page 9 of the CAG's Report which read as follow:

> "A considerable part of the operations of BEL is related to Defence Plans of the Government. Secondly, realistic

projection of the Company's Plans beyond 1986 would be possible only when the Defence Plan beyond 1986 is finalised".

The guidelines given by the Ministry of Defence, 1979 have been adopted by the Company to the extent possible. The Company has appointed a General Manager (Corporate Planning). The Company has submitted its Perspective Plan for 1985—90 (7th Plan period) in June, 1985. It is based on the projections given by the Defence Services and other Government departments. Long term Plans for 10—15 years could not be drawn up so far as the users have not been able to project their requirements beyond 5 years. This is partly attributable to the fast rate of obsolescence in electronics. The Perspective Plan 1985—90 lists out the areas in which the Company intends to invest and expand. Programmes and activities are planned or the lines indicated in the perspective Plan and excented in a time-bound manner. Government have taken note of the perspective plan of the Company and periodic reviews are undertaken at Government level to ensure that, to the extent feasible, the targets and objectives as listed in the perspective Plan are achieved.

[Ministry of Defence, Department of Defence Production and Supplies No. 17(13)/85/D(BEL) dated 9th April, 1987.]

**Recommendation (Serial No. 2, Paragraph No. 2.28)**

The Committee further feel that it is high-time that a paper on the actual performance of the Company during 1979 to 1986 in fulfilment of its objectives and obligations is brought out and placed before Parliament to enable the members to assess the growth and activities of the Company on a realistic basis.

**Reply of the Government**

A paper on the performance of the Company for the period 1979 to 1986 is enclosed. (Appendix II)

[Ministry of Defence, Department of Defence Production and Supplies No. 17(13)|85|D(BEL) dated 29th October 1986]

**Vetting remarks of Audit**

"The synopsis on Corporate objectives and plans (1979—86) and achievements together with the Annexure Parts A & B have been verified. Remarks are furnished below in respect of some items.

I. Broad basing of production activities (para 2.1 and 3.1.1 in the Plan): Part-B of the Appendix II.

Second Sub-para

*Pune Unit*

Following remarks are offered:

(i) Image Intensifier Tubes are not being manufactured since this could not be successfully developed by B.A.R.C. (Production facilities were established in anticipation of development by B.A.R.C.) and the efforts of the Company/ Government for entering into a technical collaboration agreement with an American Company have not been successful.

(ii) Production of Image Converter Tubes is Nil/negligible for want of orders.

(iii) Magnesium Manganese Dioxide Batteries produced in very small quantities for want of orders.

(iv) Bulk production of Laser Range Finders is hampered for the last 2 years with technical clearance problems.

*Taloja Unit*

The project for production of Glass Bulbs for Black and White T.V. Picture Tubes in this unit is hampered due to time and cost over runs as indicated below:

1. Date of Commencement of Project—November, 1982.
2. Original Target date for completion—May/June, 1986.
3. Revised (October 1986) date of completion—End April '87.
4. Original estimated cost—Rs. 2998 lakhs.
5. Revised (June 1986) estimated cost Rs. 4922 lakhs (64 per cent increase).

*Electronic Components area*

**Manufacture of all the items mentioned in (a) to (h) is resulting in losses to the Company as may be seen from the following particulars.**

(Rs. in lakhs)

| | + Profit —Loss | | |
|---|---|---|---|
| | 1982-83 | 1983-84 | 1984-85 |
| (a) (i) Power Devices | — 24.57 | —139.07 | — 75.35 |
| (ii) Small Singal Devices | + 19.17 | — 28.18 | —103.18 |
| (iii) Integrated Circuits | —153.29 | —140.16 | —100.77 |
| (iv) Solar Cells | — 13.81 | — 10.21 | — 4.73 |
| (b) Hybrid Micro Circuit. | — 1.33 | + 3.97 | — 1.13 |
| (c) X-Ray Tubes | + 5.26 | — 33.34 | — 12.60 |
| (d) Passive Vaccum Devices | — 5.87 | — 32.29 | — 37.23 |
| (e) (i) Cathode Ray Tubes | — 2.02 | — 0.48 | .. |
| (ii) Liquid Crystal Display | — 19.18 | — 20.58 | — 22.48 |
| (f) Transmitting Tubes | — 10.89 | — 1.81 | — 27.35 |
| (g) Micro Wave Tubes | + 2.84 | + 2.30 | — 16.49 |

Particulars for 1985-86 are not readily available with the Company."

*Comments of Government on Audit remarks*

*Pune Unit*

In the paper on performance and achievements prepared by BEL in response to the directive of COPU, the product mix revealing the broad production activities carried out in each of the 9 units of BEL has been listed. In respect of the Pune Unit, it has been mentioned that Image Intensifier Tubes, Image Converter Tubes, Magnesium Manganese Dioxide Batteries and Laser Range Finders are the main product line in this establishment. For the manufacture of Image Intensifier Tubes in the country, it had been decided some years ago that the country would have to go in for technology transfer for the manufacture of Image Intensifier Tubes. Accordingly, an agreement for technology transfer had been signed in October, 1984 with an

American Company. However, due to non-resolution of certain safeguards stipulations by the U.S. Government, the agreement has still not been finalised. Discussions have taken place with US Government representatives and efforts are being made to finalise the agreement at an early date.

In regard to Image Converter Tubes, the production is going on, although on a lower scale as the users wish to procure the improved version incorporating the Image Intensifier Tubes.

In respect of Magnesium Manganese Dioxide Batteries, the production has picked up and some orders are on hand.

In the case of Laser Range Finders, there has been inconsistency in the design parameters evolved by another agency as a result of which bulk production has not commenced so far. However, all out efforts are being made to resolve the outstanding problems.

*Taloja Unit*

The production of Glass Bulbs for Black and White T.V. Picture Tubes has already commenced at Taloja on the basis of assembly of the glass bulb with imported parts. The manufacturing process is expected to commence during the middle of this year. The revised cost of Rs. 49.22 crores has already been approved at the highest level in Government after giving justification for the increase which was mainly due to higher cost of gas and electricity, foreign exchange fluctuations, and increased prices of plant and machinery.

*Electronic Components area*

As far as the manufacture of Electronic components is concerned, BEL is operating in a very competitive field and while the demand for these components exists, it is not large enough to achieve economies of scale. BEL can, therefore, manufacture only limited quantities of electronic components and their sale on competitive rates which results in losses to the Company. The Company is basically concentrating on the high technology end of the component industry in the larger national interest rather than grow as a volume supplier of relatively lower technology components. In view of these circumstances, some losses in the manufacture of items mentioned in the vetting remarks of Audit would be inevitable. In this regard it needs to be emphasised that the overall financial performance of

BEL during the years 1979 to 1986 has been satisfactory as can be seen from the profit after tax figures from the year 1979-80 onwards:

(Rs. in lakhs)

| Year | Profit after tax |
|---|---|
| 1979-80 | 381 |
| 1980-81 | 478 |
| 1981-82 | 938 |
| 1982-83 | 1021 |
| 1983-84 | 1494 |
| 1984-85 | 1447 |
| 1985-86 | 1445 |

The growth of the Company in terms of turn over has also been satisfactory as would be seen from the following table:

| Year | Turn over in Rs. crores |
|---|---|
| 1979-80 | 85 05 |
| 1980-81 | 79.00 |
| 1981-82 | 127.29 |
| 1982-83 | 144 50 |
| 1983-84 | 163.86 |
| 1984-85 | 185.90 |
| 1985-86 | 225 90 |

**Recommendation (Serial No. 3, Paragraph No. 2.29)**

The Committee also note that when the Company submitted the Corporate Plan to the Government in November 1979, it had anticipated that it would be possible to get Government approval for the three new equipment projects proposed in the Plan which had also been cleared by the Expenditure Finance Committee during mid 1979. Accordingly, the Company concluded a licence agreement with M/s. Cornings of USA and submitted the same to Government for approval. The Government sanction for setting up the two new projects, was issued only in September 1982. The Committee further

note that when the Board approved the Corporate Plan in May, 1983 it was then informed that a revised Corporate Plan would be worked out after decisions pertaining to the setting up three new projects, sent to the Government for capacity augmentation were available. Accordingly, the revised Corporate Plan (1985-90) coinciding with the Seventh Five Year Plan was approved by the Board and submitted to Government in May 1985. The Committee desire that the revised Corporate Plan should be finalised by the Company without any further delay so as to provide it a more definite basis for planning its future activities.

**Reply of the Government**

The Revised Corporate Plan for the period 1985 to 1990 was submitted to the Government in May, 1985. Detailed presentation of BEL's perspective plan was made before the Raksha Mantri and the three Chief of Services by CMD, BEL in July 1985. The plan has been finalised by the Company in the context of the existing Defence Plan.

[Ministry of Defence, Department of Defence Production & Supplies O.M. No. 17(13)/85/D(BEL) dated 29th October, 1986.]

**Recommendation (Serial No. 4, Paragraph No. 2.30)**

While explaining the delay in sanctioning the Corporate Plan, the Secretary, Defence Production during his oral evidence suggested to the Committee that the best course for the Company would have been to split the plan into two parts, viz., one relating to the new projects requiring Government sanction and the other falling within the exclusive power of BEL with which the Company could have gone ahead without waiting for the Government sanction. The Committee note that no such advice was, however, given to BEL all along these years when the Corporate Plan was pending with the Ministry. The Committee believe that during the intervening period many meetings would have been held between Chairman and other officers of the Company and senior officers of the Ministry to discuss and review the affairs of the Company. Surely, the Committee expect the Administrative Ministries to properly guide the Undertakings, under them when they find that they are working under some wrong impression or are not clear on certain basic concepts. The Committee, therefore, feel that BEL ought to have been advised by the Department of Defence Production well in time to split the Plan rather than keeping the whole issue pending for over three years.

**Reply of the Government**

The Committee's observations that the Government could have advised the Company to split the Plan into two parts are apt and well taken and have been noted for future guidance. However, this would not have obviated the need for processing BEL's proposals pertaining to setting up of new factories involving investment in excess of Company's own power, and requiring specific Government consideration and approvals in totality.

[Ministry of Defence, Department of Defence Production & Supplies O.M. No. 17(13)/85/D(BEL) dated 9th April, 1987.]

**Recommendation (Serial No. 6, Paragraph No. 2.32)**

The Committee also desire that in order to obviate such cases of delays, BPE should consider issuing of clear guidelines about the role of Government nominees on the Board of Directors of the Public Undertakings in this regard. They should also lay down clear guidelines about the areas in which the Plans could be finalised by the Company itself and the areas where the Plan had to be got approved by the administrative Ministry or the BPE.

**Reply of the Government**

The BPE has issued guidelines about the role of Government nominees on the Board of Directors of the Public Undertakings vide its O.M. No. 18/1/84-GM dated 19th September, 1984.

The Government Directors have a dual role—as a Director of the Company and as a Representative of the Government. The Government Directors liaise between the Government and Public Sector Undertakings and also form a channel of communication. They, however, cannot commit the Government in matter which the Public Sector Undertaking has to refer to Government. They are also responsible for processing references to Government for Approval and sanctions to ensure prompt action taken.

The demarcation of the powers of decision making between the Board of the Company and the Government is given in para 5 of the same O.M. However, the specific recommendations of the Committee have been forwarded to the BPE which would be taking action in consultation with the Administrative Ministry, to explore the possibilities of issuing more specific directions.

[Ministry of Defence, Department of Defence Production & Supplies O.M. No. 17(13)/85/D(BEL) dated 29th October, 1986.]

**Recommendation (Serial No. 7, Paragraph Nos. 3.16 & 3.17)**

The Committee find that the proposals for taking up new expansion projects prepared by BEL and submitted for approval to the Board of Directors/Government, did not comply with important guidelines of BPE issued in April 1968 and December, 1969 to include in the proposals the important features like demand study, technical features, phasing of construction, profitability, cash flow analysis, cost benefit analysis, etc. The proposals gave only broad outlines of products proposed to be taken up, estimated capital cost, justification based on rough demand forecast. It is also reported that there was no system of regular monitoring of the physical and financial progress of projects under implementation and only in April 1982 such a system was introduced.

The Committee are unhappy to note that the guidelines issued by the erstwhile Bureau of Public Enterprises in April, 1968 and December 1969 have not been followed by the Company in letter and spirit and they have not been submitting well-conceived proposals of their projects for approval to the Board/Government, highlighting the essential features of the project as per BPE guidelines. In order to avoid time and cost over runs and to enable the Board of Directors/Government to appreciate to consider and approve the project proposals in true perspective, the Committee recommend that the Ministry should issue necesary instructions to all the Public Undertakings under their control that the proposals for taking up new expansion projects should be prepared by the Undertakings in accordance with the BPE guidelines issued in this regard.

**Reply of the Government**

All project proposals are generally formulated in accordance with BPE guidelines as issued from time to time. While issuing the sanctions at the Government level approving various segments of the projects, invariably a specific reference is made in the Government letter that the relevant BPE guidelines should be followed in the implementation of the project.

[Ministry of Defence, Department of Defence Production & Supplies O.M. No. 17(13|85|D(BEL) dated 29th October, 1986]

**Recommendation (Serial No. 8, Paragraph Nos. 3.18 & 3.19)**

The Committee also find that there was a system of submitting to the Board, half-yearly progress reports of major schemes under implementation and this practice was discontinued in December 1972. The reasons therefor are not on record. In December 1979 an

appraisal on the investment made in 4 components viz., Receiving Valves, Germanium Semiconductor, Silicon Devices and Integrated Circuit was submitted to the Board with a promise to put up a similar review in respect of other components. But no such review appears to have been submitted so far. No appraisal on investment in regard to investment scheme taken up as also conducted. It is only in April 1982 that the Company introduced a system of regular monitoring of the progress in the implementation of projects and collected the expenditure incurred thereon. As a result of this, the Company did not have till April 1982, ready and up-to-date details of projects implemented earlier vis-a-vis cost overruns. In this connection, the Finance Directors of BEL also informed the Committee during evidence that "they have taken up the apprisal of functioning only recently, because it was not being done earlier. We have taken up only in the last 3 years". The Company has also informed the Committee that the quarterly financial statement is now being mailed a every individual Director and a detailed discussion of schemes takes place at the Capital Budget stage.

**The Committee find that whereas monitoring is regularly carried by the Ministry quarterly, half-yearly and annually, no proper monitoring is, however, done in the Company at the Board level as admitted by the Defence Production Secretary in his evidence. There is also no institutional arrangement for periodical review for both physical and financial progress of projects under implementation. As a result of this, the Company did not have details of factual expenditure incurred on each of these projects vis-a-vis the cost overruns. This is not a happy situation. The Committee, therefore, feel that there is an imperative need for improving the Project Management in the Company so that the feed back of actual progress of the projects is reported to the Board regularly and deficient areas or malpractices, if any, coming to light are noted and timely suitable action taken to rectify the shortcomings notice. The Committee would like to be apprised of the action taken by the Company/Ministry in this regard.**

**Reply of the Government**

The Government has instructed the Public Sector Undertakings to submit every month detailed progress report on the projects under implementation and these reports are being monitored by the Government. BEL has reported that copies of these reports would be also placed before their Board hereafter.

[Ministry of Defence, Department of Defence Production & Supplies O.M. No. 17(13)/85/D(BEL) dated 29th October, 1986]

**Recommendation (Serial No. 9, Paragraph No. 3.20)**

The Committee note that the Company have recently taken up the appraisal of functioning of the projects/schemes which were not done earlier for want of experienced persons and seven such appraisals are reported to have been produced so far by various Officers which have been processed and are to be submitted to the Board. The Committee hope that the appraisals of functioning of the various projects undertaken by the Company would be completed early and suitable measures taken to improve the performance of Company.

**Reply of the Government**

BEL has reported that in respect of the following 7 projects audit appraisals have already been prepared and submitted to its Board:—

| | | |
|---|---|---|
| 1. | Reciving Valves Project | (141st Board Meeting of 26-12-1979) |
| 2. | Germanium Semi Conductors | ( —do— ) |
| 3. | Silicon Semi Conductors | ( —do— ) |
| 4. | Integrated Circuits | ( —do— ) |
| 5. | Transmitting Tubes | (166th Board Meeting of 26-11-1983) |
| 6. | X-Ray Tubes | ( —do— ) |
| 7. | Microwave Tubes | (177th Board Meeting of 23-3-1985) |

In respect of 3 other projects, appraisal work is in progress. In respect of major projects involving investment greater than Rs. 10 crores each, the Ministry monitors the progress through monthly and quarterly reports submitted by BEL, in addition to the monitoring by the BEL Board.

[Ministry of Defence, Department of Defence Production & Supplies O.M. No. 17(13)/85/D(BEL) dated 29th October, 1986]

**Recommendation (Serial No. 10, Paragraph Nos. 3.23 & 3.24)**

The Committee have observed from the Audit Report that there was a long gestation period and considerable delay in achieving the levels of production envisaged for various projects, i.e., T.V. Picture Tubes. Integrated Circuits. Silicon.

The Committee have dealt with these aspects in detail in the subsequent paragraphs of this Report (Para Nos. 3.75 to 3.183). The Committee would however, like to emphasise here that since the prolonged gestation period and long delay in achieving the levels of production ultimately affects the economic viability of projects, the Company should take effective measures to ensure that there is no slippage in the achievement of targets in so far as the new projects under execution at present are concerned.

**Reply of the Government**

The Company has reported that they have noted the COPU's views and are taking effective measures to ensure that slippags in achievements of targets do not occur for reasons within the control of the Company.

[Ministry of Defence, Department of Defence Production and Supplies O.M. No. 17(13)/85/D(BEL) dated 29th October, 1986.]

**Recommendation (Serial No. 17, Paragraph No. 3.99 to 3.102)**

The Committee note that with the advent of television broadcasting in India, a proposal for manufacture of black and white TV Picture Tubes was approved by the Board of Directors of Company in November, 1967 at a total cost of Rs. 57 lakhs based on fixed type of equipment in technical collaboration with Nippon Electric Company (NEC) of Japan. The Project was sanctioned by Government in June, 1968 and contemplated the initial production of 30,000 tubes in single shift basis from January, 1971. The production of tubes was to be increased to 1 lakh in 1973-74 based on a rough forecast of demand expected to be generated with reference to the only TV Station then existing in Delhi. The production commenced in 1970-71.

In December, 1972, as a result of new TV stations coming up at Calcutta, Madras, Lucknow, etc. the Board approved a revised project estimate of Rs. 178 lakhs for increasing the production to two lakhs tubes per annum in 3 shifts. This revised estimate was sanctioned by Government in April, 1974. The estimate was further revised in August, 1980 to Rs. 210 lakhs without giving any reasons for increase in cost for each components for project estimates and was sent for sanction of Government in September, 1980. Even when the sanction of the Government was awaited, the Board of the Company approved a further increase of capacity to 3 lakhs tubes per annum involving an additional investment of Rs. 96 lakhs. Before the Government sanctioned this increased expenditure, the Company

incurred an expenditure of Rs. 212.25 lakhs upto 31st March, 1982. The Government sanction to the project was given in 1982, and the additional capacity of 3 lakhs tubes was achieved in 1985-86.

The Committee find that the expansion project approved by the Board in December, 1972, was sanctioned by Government in April, 1974 i.e. after a delay of 13 months, as admitted by Ministry and ultimately, the project was implemented by the Company after a delay of more than 4 years from the date of Government sanction. In this connection, the Department of Electronics (DOE) had also commented that 'Local availability of TV Picture Tubes has remained/ much below the demand largely because of slow implementation of production plans by Bharat Electronics Ltd.' As a result of this delay in completing major systems/built up of capacity and underutilisation of built up capacity by the Company and six other private firms licensed by DOE, the gap between the indigenous production and demand which rose from 0.27 lakhs tubes in 1975 to Rs. 1.68 lakhs in 1981 was met by imports. From 1974-75 to 1977-78, 3.45 lakhs tubes valued Rs. 459.02 lakhs are reported by Audit to have been imported to meet this gap.

In Committee's view, the delay of over 13 months on the part of the Government in sanctioning the revised project estimates and then the enormous delay of more than 4 years on the part of the Company in executing the project, especially, when the target time fixed was 9 months, as admitted by CMD during his evidence is inexcusable, in the context of the outflow of precious foreign exchange to the tune of Rs. 459 lakhs for importing picture tubes. The Committee take it that there was no coordination between the Department of Defence Production, Department of Electronics and the Ministry of Information and Broadcasting which should have enabled BEL to get an exact idea of the demand for picture tubes in the context of new TV stations being set up and impress upon the Department of Defence Production to clear the projects in the minimal time. In this connection, the Secretary, Defence Production has himself admitted in his evidence before the Committee that 'if we had processed the matter on a day-to-day or week-to-week basis with better project management, we would have saved some more time'. The Committee are, therefore, constrained to observe that there was something basically wrong with the project formulation, implementation, monitoring and control of the Project and responsibility therefor has to be fixed both in BEL as well as Department of Defence Production. The Committee would like all concerned to take a lesson from what has happened in the past, streamline the

procedures and take proper care in future to ensure that the projects are conceived and processed by the Company and sanctioned by Government within the minimum possible time. Thereafter, there should be no let up in execution of the project which must be completed within the scheduled time to avoid any loss of foreign exchange and or heavy costs and time over-runs.

**Reply of the Government**

Government agrees with the recommendation of the Committee on the need to have close monitoring of sanctioned projects to ensure that projects are executed within the time and cost schedules. The need for accountability is also appreciated. Amonitoring and evaluating system at various levels is already in operation. In order to improve it further a Task Force has been set up in the Ministry at the Additional Secretary's level for finalising detailed reporting and monitoring procedures pertaining to, *inter alia*, project implementation. The performance of the PSUS under its control of the Department of Defence Production is reviewed periodically at the level of Secretary and Minister. A close watch is kept on the progress in implementation and completion of major projects and remedial steps taken to avoid time and cost over-

[Ministry of Defence, Department of Defence Production & Supplies O.M. No. 17(13)|85)|D(BEL) dated 9th April, 1987].

**Vetting remarks of Audit**

No remarks on the corrective action taken. However, reply is silent regarding the recommendation for fixing responsibility both in Bharat Electronics Ltd,. and the Department of Defence Production.

**Comments of the Government on remarks of Audit Department of Defence Production and Supplies**

The corrective measures taken by the Ministry have been enumerated in the reply of the Government. As regards fixing responsibility both in Bharat Electronics Ltd., and Department of Defence Production, it may be stated that a detailed chronology of events indicating the various agencies involved in approving/sanctioning the project and time taken by each was submitted to the COPU at the time of oral evidence of the Department of Defence Production. It was kindly explained to the Hon'ble Members of the Committee

that the time taken in sanctioning the project was by and large justified in view of number of agencies including outside the Ministry being involved.

**Recommendation (Serial No. 18, Paragraph No. 3.103)**

The reasons explained for the delay such as—the change over from manual operation to semi-automatic system, implementation of project without foreign collaboration, delay by suppliers/sub-contractors of critical components are not unusual and can easily be taken care of by proper planning, regular monitoring and on the spot inspections. The Committee therefore, consider that these were not such matters as could not have been surmounted by the management with proper perspective and firm resolution.

**Reply of the Government**

The Company has been advised to note for strict compliance the observations pertaining to the need to have proper planning, regular monitoring and on the spot inspection to avoid delays. It is hoped that such situations will not recur.

[Ministry of Defence, Department of Defence Production & Supplies O.M. No. 17(13)|85)|D(BEL) dated 9th April, 1987].

**Recommendation (Serial No. 19 Paragraph No. 3.104)**

The Committee are informed that TV Tube is not yet an exportable item and the question of export would be considered only after the production of indigenous Glass Shell at a cost comparable with international cost is achieved. The Glass-shell at present imported is expected to be produced indigenously by November, 1986 with the commissioning of Taloja Plant located near Greater Bombay. The Committee desire that the Government|BEL should take effective measures to ensure that the glass-shell plant comes up within the scheduled time to enable Company to consider the possibility of exporting TV Picture tubes to such countries where there is still a good market of black and white TV.

**Reply of the Government**

The Government agrees with the recommendations of the Committee. Besides BEL, the Government too is closely monitoring the progress of the Glass Shell Project.

[Ministry of Defence, Dept. of Defence Production & Supplies O.M. No. 17(13)/85/D(BEL) dated 29th October, 1986]

**Recommendation (Serial No. 20, Paragraph Nos. 3.147 to 3.150)**

The Committee note that the proposal to undertake the manufacture of Integrated Circuits (ICs) for production of 1 million IC at a cost of Rs. 65 lakhs was approved by the Board of the Company in December, 1969 in June, 1970, the cost was revised to Rs. 122 lakhs mainly to provide for a separate building with service facilities. The Government approved the project in January, 1971. Again in September, 1971, the estimate was further revised providing for a further investment of Rs. 46.50 lakhs on plant and machinery and also on air conditioning and other facilities needed for MOS techniques since it would be possible not only to increase the annual capacity from 1 million to 2 million ICs but also to establish manufacture of a range of Digital ICs including CMOS types of chips incorporating latest techniques in addition to the linear ICs. The project was approved by Government in November 1971.

For this purpose the Company concluded a technical Collaboration Agreement in March, 1971 to be in operation for 10 year period with the Radio Corporation of America (RCA) for the supply of design and production information in respect of families of ICs which was under their range of manufacture. Before concluding the Agreement; the Board was also informed that there was general reluctance on the part of the firms in USA to agree to collaboration and only RCA had agreed to collaborate with the Company. The collaboration agreement which expired in April, 1981 has been extended upto December 1990. An amount of Rs. 17.04 lakhs was paid to RCA between March, 1971 to March, 1974. In addition, Rs. 16.60 lakhs were paid towards minimum compensation in consideration of the information and services, licences, rights and privileges made available and Rs. 0.44 lakhs for supply of drawings. In addition, royalty of Rs. 26.25 lakhs was also paid at 5 per cent of the net sale value of ICs during the period June, 1969 to April, 1981. The Company actually obtained design information only for 177 types and production information only for 146 out of 348 types of ICs covered as per RCA catalogue.

According to the Department of Defence Production agreement covered not only the range of products being produced by RCA at the time of the collaboration agreement entered into but also those produced by RCA during the currency of the agreement. This was extremely necessary as the IC technology was is rapidly progressing with a high risk of obsolesence of products at any given point of time.

While looking at the component-wise break up of original and revised estimates and actual expenditure incurred upto March, 1984, the Committee find that the actual expenditure against air-conditioning and cleaning room facilities and industrial furniture and contingencies exceeded the revised estimates of September, 1971 by about 52.8 per cent and 235.5 per cent respectively (the expenditure incurred from Rs. 25 lakhs to Rs. 33.20 lakhs and from Rs. 4 lakhs to Rs. 13.42 lakhs respectively). After the Board had approved the initial estimate, the matter was not placed before the Board for revising the estimates and going into the reasons for increased cost over-runs. In fact expenditure initially approved by the Board was exceeded without getting approved by the Board.

**Reply of the Government**

While the component-wise expenditure against air conditioning and cleaning room facilities and industrial furniture and contingencies exceeded the revised estimate by 52.8 per cent and 235.5 per cent respectively, the total actual expenditure exceeded the total sanction by 5 per cent only. (Revised Estimates—Rs. 168.50 lakhs, actual expenditure—Rs. 176.77 lakhs).

2. As the total expenditure exceeded the total sanction by only about 5 per cent, the Company did not seek specific approval from the Board or the Government for this excess expenditure.

3. Agreeing with the recommendation of the COPU as mentioned in recommendation No. 30 (paras 3.163 and 3.164), the Company has stated that suitable instructions are being issued for the guidance of all concerned relating to:

(i) keeping sufficient margin in the total project estimates to provide for price escalation factor; and

(ii) close monitoring of the actual expenditure as against sanctioned estimates (as well as with further break-down details as in the detailed project report) in terms of both time and cost.

4. The Company agrees that henceforth the Board will be apprised of the reasons whenever the expenditure, component-wise, exceeds 10 per cent even if the overall cost over-run does not so exceed.

[Ministry of Defence, Department of Defence Production & Supplies O.M. No. 17(13)/85/D(BEL) dated 9th April, 1987].

**Recommendation (Serial No. 25, Paragraph No. 3.156)**

The Committee also find that the Company developed digital TTL devices over a period of 2 years in cooperation with the Tata Institute of Fundamental Research, Bombay at a cost of Rs. 14 lakhs as it was then thought that TTL devices may have a large market as they were standard devices used all over the world. However, since the Company's costs were higher as compared to international prices and as import ban did not materialise, the Company stopped production of TTL series in 1978-79 after producing 3.14 lakhs ICs valued at Rs. 42.05 lakhs from 1972-73 onwards. The Company held an inventory of 84268 TTL devices (Value: Rs. 3.32 lakhs) as on 31st March, 1982, which was moving very slowly even after special reduction in prices. The Committee desire that effective steps should be taken to liquidate the inventory of TTL devices.

**Reply of the Government**

BEL has reported that it has taken effective steps to liquidate the stocks of TTL devices and the stock as on 31st March, 1986 was 14,696 as against the stock of 84,000 as on 31st March, 1982.

[Ministry of Defence, Department of Defence Production & Supplies O.M. No. 17(13)/86/D(BEL) dated 29th October, 1986]

**Recommendation (Serial No. 30, Paragraph Nos. 3.163 & 3.164)**

As regards excess expenditure incurred on air-conditioning and industrial furniture, the Committee are informed that actual expenditure of Rs. 176.73 lakhs was in excess only by 4.9 per cent over the sanctioned amount of Rs. 168.50 lakhs. Therefore, no specific approval of the Board was called for. The price escalation is stated to be the main reason for this cost overruns. The Committee, however, feel that at the time when the project estimates were formulated, the Company should have taken into consideration the price escalation factor and should have kept sufficient margin in the total estimates of the project. The Finance Director of BEL has also admitted that "it has been an estimating error". The Committee trust that such matters will be taken of in future and similar situation will not recur.

The Committee have a feeling that the increase in expenditure is not just due to cost overruns caused by price escalation. There has been sharp increase in the original estimates prepared and the actual expenditure incurred. The original estimates which was Rs. 15 lakhs in June, 1970 was revised in September, 1971 to Rs. 25

lakhs. Therefore, in just one year and 3 months, the cost escalation could not be to the tune of 10 lakhs unless there were some extraordinary reasons for this increase. The Committee consider it a case of bad estimation, and defective planning. The Committee also feel that when the initial expenditure was specifically approved by the Board, the Board should have also been apprised of the increase in expenditure alongwith the factors responsible therefor. The Committee desire that the Company should lay down suitable instruction in this regard so that similar situations do not recur in future.

**Reply of the Government**

The Company has stated that suitable instructions are being laid down by them for the guidance of all concerned relating to:

(1) Keeping sufficient margin in the total project estimates to provide for price escalation factor.

(2) Close monitoring of the actual expenditure as against the sanctioned estimates in terms of both time and cost.

[Ministry of Defence, Department of Defence Production and Supplies No. 17 (13)|85|D (BEL) dated 29th October, 1986]

**Recommendation (Serial No. 31, Paragraphs Nos. 3.165 & 3.166)**

The Ministry have stated in their written reply that the working of the ICs project was not specifically reviewed by the Ministry. The Committee, therefore, recommend that the Government should review the justification for continuing the IC Project in the Company in all its ramifications including losses suffered and extremely limited contribution to in-house production.

During evidence, the Secretary, Defence Production also informed the Committee that "if we want to be at par with the World technology in regard to the development and production of ICs, a huge amount will have to be spent on R & D for which we have neither resources nor time. The country will, therefore, have to take national view on this. Once a national policy is laid down we will know which way or how far we will have to go". The Committee have also been informed that the Government has recently set up a National Micro Electronic Council to consider various issues connected with the fostering of the future of ICs development and production in the country. The Committee desire that the National Micro Electronics Council should finalise their views on basis of which Government should formulate a clear cut national policy for guidance of all concerned.

**Reply of the Government**

This aspect has been carefully examined in consultation with the Company. Two important aspects have been brought out by the Company:

(a) Innovations in the design of systems for the Defence Electronic Equipment can often be traced back to revolutionary developments in the design of Semiconductors in general and to Integrated Circuits and Hybrid Chips in particular. The design conception for Defence Electronic Equipment is now-a-days seen to revolve more around ICs than discrete devices. BEL's objective of producing more compact military equipment|systems requires that development in the field of Integrated Circuits are kept abreast of. Similarly Integrated Circuit designs are also related to the specific circuits used in the equipments and the trend is towards development of Application Specific Integrated Circuits (ASICs) and custom built and semi custom built ICs (CBICs) & (SCBICs). It is for this reason that hi-tech electronic equipment manufacturing Companies of repute such as Motorola & Fairchild of USA, Marconi & Plesseys of UK etc. have set up either within themselves or as subsidiary IC manufacturing facilities. A recent example in India is that of the Indian Telephone Industries which has also now set up an in-house IC facility. In view of these needs, it is very essential for colocating the equipment and IC manufacturing facilities since a very commendable amount of close interaction and coordination between these disciplines is required from the design phase itself. In fact it has been considered that the existing facilities require further upgradation and the Company is presently engaged in discussions with the concerned Government Departments in this regard. Self reliance and strategic considerations also dictate the need to have this in-house facility for this crucial component.

(b) The IC manufacturing and marketing operations have also recently shown an up swing and the Company expects to shortly break-even and become profitable. The Company has also recently made a break-through in the introduction of indigenously produced colour TV ICs which will be brought out in the market in the near future.

In the light of above, the Government also feels that the IC project in the Company should continue as this is a high technology area and has great potential in the field of Defence Electronics.

From the financial point of view too, the Company expects to start making a profit very soon and there is, therefore, no need for discontinuing this project.

The Ministry has noted the recommendation of the Committee and would take further action once the National Micro Electronic Council finalises its views and submits its report to the Government and the Government formulates a clear cut national policy on the future of IC production in India.

[Ministry of Defence, Department of Defence Production & Supplies O.M. No. 17(13)|85|D (BEL) dated 29th October, 1986]

## CHAPTER III

## RECOMMENDATIONS WHICH THE COMMITTEE DO NOT DESIRE TO PURSUE IN VIEW OF GOVERNMENT'S REPLIES

**Recommendation (Serial No. 5, Paragraph No. 2.31)**

Incidentally, the Committee also do not appreciate the nominal or passive role played by the Government nominees on Board of Directors of the Company as they also appear to have failed on their part to advise the Company to split the plan as has now been suggested by the Secretary, Defence Production in his evidence said "the nominee should function as the eyes and ears of the Government in order to ensure the growth of the Undertaking as also to avoid any hanky panky". While agreeing with him, the Committee expect the Government nominees on the Board of Directors of Public Undertakings to play a positive and active role and to make constructive and timely contribution for the efficient working of the Company rather than to remain a passive spectator. The Committee are of the view that it is a clear case of delay on the part of the Company and lack of vigilance on the part of the Administrative Ministry and also the Government nominees on the Board of Directors which ultimately resulted in the dealy in framing the objectives and obligations and Corporate Plans of the Company. This caused delay in setting up the new equipment projects, which resulted in escalation of costs and avoidable loss due to non-production of equipments. The Committee, therefore, recommend that the matter should be enquired into at a high level Committee with a view to fixing responsibility for this inordinate delay.

**Reply of the Government**

In pursuance of the instructions of BPE issued in May, 1979, BEL prepared a note detailing its corporate Policy objectives and micro-objectives and sent the same to BPE in November, 1979 with a copy to the Ministry. The Ministry conveyed its observations on the objectives, and corporate plan of the company in December, 1979. The aforesaid position is noted in para 2.3 of the report of the Committee.

So far as the new Equipment Projects are concerned, BEL's proposals had been cleared by the Expenditure Finance Committee in

1979 itself. The proposals had to pass through many Governmental channels such as Integrated Finance, Planning Commission, Department of Electronics and the Sodhi Committee. These procedures were time consuming but obligatory and have to be followed before major investment decisions can be taken by the Government. The entire decision making process in respect of the new projects was unconnected with the corporate plan and was pursued independently with the utmsot despatch, notwithstanding the numerous channels which evaluated the proposals from all possible angles.

Appreciating that the path of obtaining clearances was too labyrynthine, the procedures relating to the project approvals were further streamlined by the Government by more decentralisation and delegation of enhanced powers to the Company's Board vide BPE's Memo No. BPE|1(64)ADV.(F)|78 dated 20th August, 1986, (enclosed as Annexure 'A').

The position narrated above brings out that the prolonged time taken for finalising the new projects was to a considerable extent inherent in the Government system. Viewed in this light, an enquiry for fixing responsibility for the delay may perhaps not yield any fruitful results or lessons for the future.

[Ministry of Defence, Department of Defence Production & Supplies O.M. No. 17(13)|85|D(BEL) dated 29th October, 1986]

**Vetting remarks of Audit (para 2.31)**

"No action was taken by the Company till November 1979 on BPE's instruction of November, 1970 to initiate action to frame the objectives and obligations.

The revised Corporate Plan in the light of the remarks of the Defence Ministry in December, 1979 on the earlier Plan was approved by the Board of Directors only in May, 1983 though Government's sanction for setting up of 3 new projects had been received in September|October, 1982."

**Comments of the Government on Audit remarks**

In response to the observation that no action was taken by the Company till November, 1979 on BPE's instructions of May, 1970 to initiate action to frame the objectives and obligations, it may be stated that the primary responsibility of the Company is to meet the requirements of the Defence Services for the electronic equipments. The Company's objectives and obligations are, therefore, largely tied

to the plans of the Defence Services, both in the short term and in the long term. However, the Corporate Plan was revised in the light of the Ministry's remarks and this was finally approved by the BEL Board of Directors in May, 1983.

**Recommendations (Serial No. 11, Paragraphs No. 5.62 to 3.66)**

The Committee note that equipment and facilities set up initially at Ghaziabad were designed to achieve an annual production of Rs. 1790 lakhs entirely for the Defence. The bulk of the requirement (59%) related to the manufacture of a particular equipment for which the major portion of the facilities set up were to be utilised. The Ghaziabad Unit went into commercial production in September, 1973 but in October, 1974 the Company was informed by Government that "it should not commit for the manufacture of 'A' Type Radar beyond the 5th". The original requirement envisaged by Government was for the manufacture of 23 'A' type Radars which in term of value accounted for 56% of the total requirement. As a result of this drastic cut in the Defence Plan, the expected orders did not materialise and the raw materials and components valued at Rs. 894 lakhs imported from the collaborators became surplus to requirement. As the factory was set up to meet the Defence requirement of Radars etc., and expected orders were not forthcoming, the capacity established also remained unutilised. The Company sought compensation from Government for the financial consequences arising from the idle capacity caused due to short loading of the factory *vis-a-vis*, the installed capacity and for incurring considerable expenditure in installing the plant, training of staff and for providing infrastructure for production. The amount of compensation claimed therefore was Rs. 677.44 lakhs besides storage and maintenance charge of Rs. 8.40 lakhs per annum. The Government rejected the claim for compensation on the ground that "BEL as an entity was making profit though one unit may not be earning profit and that the problem of under-utilisation of the capacity should be treated as a normal production problem". The Committee are not convinced by this argument of the Government. Since the Government spelt out speicfic requirement of 23 'A' Type Radar under ADGES Plan, the Company rightly went ahead and imported raw material from the collaborator to the tune of Rs. 894 lakhs for the progressive use upto the 10th Radar of Type 'A'. The Committee are convinced that the claim of compensation preferred by the Company was just and should have been paid by the Government speeifically when the production capacity for a particular type of item was created at

the instance of Government. The argument of the Government that the payment of compensation was not necessary as the Company was making profits on other itmes does not seem to be logical. The Committee desire that in future there should be a machinery to resolve such disputes. Again, the argument of the Government that the "problem of under-utilisation of capacity should be treated as a normal production problem" is also not convincing. The Ghaziabad Unit faced a peculiar phenomenon as the capacity created for the manufacture of a particular defence item, remained underutilised due to subsequent changes in Defence Plan. As a result, the Ghaziabad Unit was in the red for a long time. In fact upto 1979-80, it suffered heavy losses which accumulated to Rs. 1420 lakhs. It started earning profit only from 1980 onwards. The Committee are firmly of the view that had the Government not changed their Defence Plan after placing firm orders with the Company, the performance of the company would have been much better and it could have turned the corner soon after going into production.

The Committee note that as a result of a drastic cut in the Defence Plan there was a gap between what was originally conceived or the internal demand placed on the Ghaziabad Unit and the actual requirement. Therefore, to fill this gap it was considered necessary to start production of items which to some degree have already been seen through in the Bangalore Unit. Accordingly, in July 1975, a scheme of balancing the Ghaziabad Unit was approved by the Board to achieve diversified production and profitability in the "shortest possible time". The scheme involved an expenditure of Rs. 100 lakhs to be treated as a new project and was approved by the Government in May, 1976. Under this scheme certain items of equipment under development at Bangalore Unit viz, UHF Radio Relay (LUS 751) VHF Sets for Police/Mobile Equipment and two more items of equipment meant for Defence were to be transferred to Ghaziabad Unit for productionisation. It was also decided to produce 5 more items in Ghaziabad Unit and these included two items relating to Defence, Micro-wave equipment, Multiplex equipment and Telemetry/Telecontrol equipment. The actual expenditure incurred on diversification programme upto 31-3-1982 was Rs. 93.33 lakhs in addition to the test equipment valued at Rs. 12.52 lakhs transferred from Bangalore Unit.

The Committee have also noticed that though the diversification scheme was launched in 1975-76, a beginning was made only in 1976-77 as none of the items transferred from Bangalore had been

firmly established in the regular production line prior to the transfer. As a result, the Ghaziabad Unit had to tackle many problems relating to design development, users' clearance before commencing the regular production, re-engineering, re-start, re-work etc. For this, the Company incurred an expenditure of Rs. 43.73 lakhs on further development efforts upto 31 March 1984.

The Committee have also been informed that out of five items planned for production, one item meant for Defence, did not reach the production stage on the ground that the expected orders did not materialise. Another item (4/7 GHZ Micro-wave equipment) under development at Bangalore was not transferred and productionised there itself. For the remaining three items, the production commenced in 1978-79. As a result, the machines transferred to Ghaziabad Unit could not be utilised for immediate production and Unit suffered heavy losses which accumulated to Rs. 1420 lakhs upto 1979-80. Only from 1980-81 onwards, the unit stand earning profits and was ultimately able to wipe off not only the cumulative losses but also earned cumulated profit Rs. 34 crores by the end of 1984-85. Implementation of diversification programme also got delayed by two years.

The Committee are concerned to note that no specific time schedule was fixed for the implementation of the diversification programme in the context of its being achieved in the 'shortest possible time' by the Company. During evidence, when the Committee repeatedly asked about the time schedule, the representative of the Company did not give any specific answer to it. It was, however, admitted that "what was expected in 1978-79 came up really later by two years".

**Reply of the Government**

(a) The point which needs to be appreciated pertaining to the Compensation claim is that BEL, and most other Public Sector Undertakings, are wholly owned by the Government in the name of the President. The President is the owner, the share holder as well as the user. In such a situation, the idea of making any claim for compensation for under-utilisation or non-utilisation of capacity did not appear appropriate. Public Sector Enterprises are aided by Government in many other ways e.g., advances are given at no or low rates of interest, liquidated damages are generally not imposed for late deliveries and efforts are made to utilise capacity by alternative orders. It was, therefore, felt that there was no justification for making any claim for compensation of the kind made by

BEL. The problem of under utilised capacity should be treated as a normal production problem and if there are any overall losses, the losses would in any case have to be borne by the owner viz., the State. Temporary difficulties of the type under discussion now should be treated as a part of their over-all ways and means position and should not be the subject of a claim for compensation from the owner viz., the Government itself. In view of this position, there appears no need for establishing a machinery to resolve such "disputes".

(b) The Committee has also observed that had the Government not changed their Defence Plan after placing orders with the Company, it would have resulted in better performance by BEL Ghaziabad. In this context it needs to be appreciated that changes in the Defence Plan often become necessary due to various factors such as strategic consideration, changes in the geo-political situations etc. Defence Plan is changed only when it is absolutely unavoidable and the Security of the country is involved. Continuous changes in these factors do not permit the formulation of rigid Defence Plan, and the usefulness of any Defence Plan can be gauged only in terms of its flexibility. A long term Defence Planning apparatus has recently been set up by the Government. However, even this would not rule out the possibilities of some changes now and then.

[Ministry of Defence, Department of Defence Production & Supplies O.M. No. 17(13)/85/D(BEL) dated 29th October, 1986.]

**Recommendation (Serial No. 21, Paragraph No. 3.151)**

The Committee have also observed that no time schedule was laid down for the completion of these various projects while these were approved by the Board. Taking into account the lead time of 18 months from the date of entering of the collaboration agreement required for establishing production, the production should have commenced by August 1972 (18 months from March, 1971). Even according to the phased manufacturing programme indicated to Government in December, 1969 production of ICs at the rate of 0.5 million and 1 million should have commenced from 1972-73 and 1973-74, respectively. However, only pilot production started in 1973-74 and regular production commenced in 1974-75 in a temporary location. The building for the project was completed and taken over only in August, 1974 and air-conditioning of building, as essential facility for the production of ICs was undertaken during the period September, 1975 to January, 1977. Production could not reach even upto 1 million number per annum during 1981-82

although the matched capacity was 1.5 million. This indicated a serious handicap suffered by the project due to omission to fix a time schedule for achieving the rated capacity, absence of monitoring/reporting system on project execution etc.

**Reply of the Government**

The Company has submitted that the major reasons for not achieving the then planned capacity of 1 million ICs were not delays in building construction only, but also slow market build-up for the product. Upto 1979 the IC manufacture had to be confied to the requirements of the professional type for the equipment production. The requirements that had been projected from other organisations also did not materialise due to the cost factor which was also dependent on the volume of production, international production being at a very low level. The market for ICs started looking up only from 1982 onwards. The Company could reach the level of production of 2.852 million devices in 1985-86.

2. During the oral evidence it was submitted for the information of the Hon'ble Members of COPU that such projects involved huge investments and had to be undertaking to meet strategic requirements. This was in accordance with the national policy. The experience gained in the field proved to be a national asset. Even in European countries the companies who had undertaken such ventures had suffered loss initially.

[Ministry of Defence, Department of Defence Production & Supplies O.M. No. 17(13)/86/D(BEL) dated 9th April, 1987.]

**Vetting remarks of Audit**

COPU's recommendations were framed after considering the facts brought out in sub-para 2 of above reply of Ministry. Further, these facts were not brought to the notice of the Board while seeking approval for the project. As stated by the Ministry, while losses in other countries are only in intial years, this is recurring even now in this Company.

**Comments of the Government on Audit remarks**

In response to the observation that these facts were not brought to the notice of the Board while seeking approval for the project it may be stated that the IC project was discussed in the Company's 82nd and 91st Board meetings. The Board had agreed that

the capability for production of ICs was vital in order to be able to design and develop the latest generation of electronic equipment. With regard to investments and turn-over, the Board had noted that the technology had been undergoing rapid changes and it was, therefore, desirable to use the semi conductor operation in toto rather than piecemeal.

As regards the observation that the losses in other countries were in the initial years while the same are recurring even now in BEL, it may be explained that the production of ICs at BEL has substantially picked up for the last few years and profits have been earned during 1985-86 and this trend is expected to be maintained in future.

**Recommendation (Serial No. 22, Paragraph Nos. 3.152 and 3.153)**

The Committee also find that there has been heavy accumulation of stock of linear CMOS and TTL type digital ICs and the stock by the end of March, 1984 amounted to 32.10 lakhs. The main stress was being given on production of linear ICs which accounted for 91 per cent to 96 per cent of the total production. As regards CMOs digital ICs, the item produced related to obsolete CD 4000 A series and there was an accumulation of the stock of 1.19 lakhs valued at Rs. 9 lakhs (manufacturing cost) as on 31st March, 1982. The accumulated stock, however, came down to 0.58 lakhs as on 31-3-1984.

The Committee fail to understand as to why the Company continued the production of ICs of a type which had gone obsolete and were not actually needed and after having established capacity why did the company not concentrate on the production of ICs which were actually needed.

**Reply of the Government**

The Company has stated that the CD 4000A device was finding usage during the course of its production. The accumulated stocks has came down from the level of 1.19 lakhs devices (in 1982-83) to less than 12,000 devices (in 1985-86).

With regard to the point raised as to why the Company did not concentrate on the production of ICs which were actually needed, the Company has stated that only such of those types required in economical quantities could be undertaken for production.

[Ministry of Defence, Department of Defence Production & Supplies No. 17(13)|85|D(BEL) dated 9th April, 1987.]

**Vetting remarks of Audit**

The economic batch quantity and the actual manufacture for CD 4000 A device is not stated.

**Comments of the Government on Audit remarks**

On the above observation, it may be stated that CD 4000 A device represents a series of devices and not any single IC in particular. The manufacture of the devices related to CD 4000 A series was guided by the anticipated market demands and not by consideration of economic batch quantity. Here it may also be stated that production of different type of ICs is taken up as a batch depending upon their demands and as such it may not be possible to define the economic batch quantity for each type of IC.

**Recommendation (Serial No. 23, Paragraph No. 3.154)**

The Committee have also observed that the Company actually obtained design information for 177 and production information for 146 out of 348 types of ICs being produced by the collaborators viz., RCA of USA. The BEL has produced only 21 types in 1984-85 of which 10 were exclusively for sale, 7 for internal consumption and 4 types for both sale and internal consumption. ICs taken for production were mainly of SSI complexity and in some cases of obsolete design. Price-wise, the Company is not able to compete in the open market and as a result of which their stock of ICs kept on accumulating. The Company has incurred cumulative loss of Rs. 898 lakhs due to uneconomic production and high cost. In fact, the Company has drained away the entire investment of Rs. 497 lakhs as was envisaged at the time the project was conceived. Therefore the Committee feel that the object behind the project proposal of September, 1971 for establishing the capacity to manufacture a range of digital ICs including CMOS types has not been achieved to any appreciable degree. The Committee are of the view that taking up of this IC Project by the Company was ill-conceived as the demand potential in India was too limited to ensure a competitive cost of production. Even advanced countries like UK & France have not set up their own facilities for manufacture of ICs though they are far more advanced than India in the field of electronics.

**Reply of the Government**

The detailed reply covering this point has been given by the Company against recommendation No. 24 following.

[Ministry of Defence, Department of Defence Production & Supplies No. 17(13)|85|D(BEL) Dt. 9th April, 1987.]

**Recommendation (Serial No. 24, Paragraph No. 3.155)**

However, another Public Sector agency viz. Semiconductor Complex has also been set up at Chandigarh for the production of ICs exclusively. Thus now there are two Public Sector agencies in the country at present in the field of ICs. The Committee recommend that the Government should consider the transfer of IC Project of BEL to the Semiconductor Complex, Chandigarh or to some of the universities or IITs and devote the resources of BEL in some other fields.

**Reply of the Government**

This aspect has been carefully examined in consultation with the Company. Two important issues have been brought out by the Company:—

(a) Innovations in the design of systems for the Defence Electronics Equipment can often be traced back to revolutionary development in the design of Semiconductors in general and to Integrated Circuits and Hybrid Chips in particular. The design conception for Defence Electronic Equipment is now-a-days seen to revolve more around ICs than discrete devices, BEL's objective of producing more compact military equipment|systems requires that developments in the field of Integrated Circuits are kept abreast of. Similarly Integrated Circuit designs are also related to the specific circuits used in the equipments and the trend is towards development of Application Specific Integrated Circuits (ASICs) and custom built and semi-custom built ICs (CBICs and SCBICs). It is for this reason that hi-tech electronic equipment manufacturing Companies of repute such as Motorola and Fairchild of USA, Marconi and Plesseys of UK etc. have set up either within themselves or as subsidiary IC manufacturing facilities. A recent example in India is that of the Indian Telephone Industries which has also now set up an in-house IC faci-

lity. In view of these needs, it is very essential for colocating the equipment and IC manufacturing facilities since considerable amount of close interection and coordination between these disciplines is required from the design phase itself. In fact it has been considered that the existing facilities require further upgradation and the Company is presently engaged in discussions with the concerned Government Departments in this regard. Self reliance and strategic considerations also dictate the need to have this in-house facility for this crucial component.

(b) The IC manufacturing and marketing operations have also recently shown an upswing and the Company expects to shortly break-even and to become profitable. The Company has also recently made a break-through in the introduction of indigenously produced colour TV ICs which will be brought out in the market in the near future.

The Ministry in broad agreement with the above assessment of the Company is keeping the matter under constant review. In view of this situation, it is requested that the recommendation to transfer BEL's IC facility elsewhere be kept in abeyance for the present.

[Ministry of Defence, Department of Defence Production and Supplies O.M. No. 17(13)|85|D(BEL) Dated 29th October, 1986]

**Vetting remarks of Audit**

**Recommendation S. Nos. 23 and 24 (Paragraph Nos. 3.154 and 3.155**

In the reply to the recommendation Number 26, Ministry have stated that the Chandigarh Complex is set up for manufacture of large scale and very large scale ICs (LSI and VLSI) which are also being manufactured by Bharat Electronics Ltd. As the reply to recommendation No. 24 recognises subsidiary manufacturing facilities, the Chandigarh Complex itself can be, by mutual arrangement, regarded as a subsidiary manufacturing facility. Indian Telephone Industries Ltd., is understood to have indigenously set up the state-of art process for manufacture of most advanced technology available in the field of electronics viz. LSI VLSI while that of Bharat Electronics Ltd., with collaboration is confined mainly to SSI and MSI grade.

**Comments of Government on remarks of Audit**

With reference to the above observation, it may please be stated that large scale and very large Scale ICs (LSI and VLSI) are not being manufactured by BEL. However, it is added that for an organisation like BEL engaged in the development and manufacture of sophisticated ICs based on Defence and professional electronic equipment, it would be worthwhile to have an in-house IC facility.

**Recommendation (Serial No. 29 Paragraph No. 3.162)**

According to the Company, the matched capacity for the production of ICs was 0.5 million upto 1978-79 and 1.5 million from 1979-80 but the actual production was much less as compared to the matched capacity. The actual production in 1982-83 and 1983-84 was 6.14 lakhs and 9.88 lakhs respectively. Thus, the utilisation of capacity created has been declining steadily from 1979-80 onwards upto 1982-83 and consequently losses have been increasing progressively. The reasons for the heavy shortfall in production capacity compared to rated capacity have neither been analysed by the Company nor reported to the Board. Low indigenous demand caused by availability of cheaper imported ICs was stated to be the main reason for the shortfall in production. But Committee's appraisal of the situation shows that this situation had arisen due to meagre capacity and still smaller output of only a few types of linear ICs of mainly CSI complexity in the face of larger indigenous requirements of various types as well as the price competition from mass produced foreign ICs. The Committee recommended that reasons for the heavy shortfall in production may be analysed by the Board and remedial measures taken. The Committee may be informed of the outcome.

**Reply of the Government**

The Company has informed the Government that a detailed appraisal of the Project was made by the Internal Audit Department of the Company and submitted to the Board at the 141st Meeting on 26th December, 1979. The Company has also informed that the production of the ICs has started picking up and has furnished the following figures:

| | |
|---|---|
| 1983-84 | 9.88 lakhs Nos. |
| 1984-85 | 17.20 lakhs Nos. |
| 1985-86 | 28.52 Lakhs Nos. |
| 1986-87 | 35.00 lakhs Nos. |

The Company is presently engaged in detailed discussions with the Department of Electronics relating to the whole aspect of IC operations and a detailed paper would be presented to the Board and later to the Government after the needed conclusions are reached. From the Government level, the National Micro Electronics Council under the Department of Electronics is also seized of the subject pertaining to developments in the field of ICs needed in the country.

With regard to the shortfalls in production for the period earlier to 1982, the Company has suggested that it may not serve any useful purpose to institute an enquiry at this distance of time. However, the problems pertaining to rapid technological changes, market situations, etc. have been brought out in the Notes submitted by the Company (placed as Annexure to Recommendation Serial No. 28). The Government accepts this submission by the Company.

[Ministry of Defence, Department of Defence Production & Supplies O.M. No. 17(13)|85|D(BEL) dated 29th October, 1986.]

**Recommendation (Serial No. 32, Paragraph Nos. 3.181 and 3.183)**

The Committee note that the Silicon material project considered critical from national angle and sanctioned by Government in 1979 was not implemented due to want of finance. Meanwhile two private-sector companies were given licences for production of silicon-The Company's requirements of silicon material are being met from private sector indigenous sources and also through imports.

The Company have tried to argue that in 1977-78 when this project was envisaged, there was apprehension of the criticality for the silicon material but after the project was sanctioned in 1979, the project was deferred for want of finance. The Committee were further informed that this deferment ultimately proved beneficial to the Company as silicon shortage eased by early 1981.

The Committee consider that non-implementation of the project by the Company for want of finance was not justified. After having obtained Government sanction, the Company should have approached the Government for finances in case they found it difficult to raise the finance from their own internal resources. Further, when they had taken sanction of Government for the Project, the minimum they should have done was to take the concurrence of Government before abandoning the Project. The Ministry's reply justifying the abandonment of the Project is also not convincing.

To say the least the Committee feel that by not implementing the project of critical nature from national angle Government/BEL has surrendered its interests in favour of private entrepreneurs for want of finance which cannot be considered to be sound.

**Reply of the Government**

The Company has stated that the criticality for the Silicon material arose at a point when BEL had proposed taking on the project. The position eased subsequently and the project was hence not pursued further. The Company has also stated that the decision to abandon the project has been proved correct both from the availability angle as well as from the viability factor looking at the fate of all private sector parties which had made similar investments. The Company has also explained that Government was not approached for funds as it was not convinced itself of the wisdom of continuing the project subsequently even though the Company had itself sought and obtained sanction for setting up manufacture of monosilicon.

Government has noted that the Department of Electronics who deal with this subject have stated that silicon material has not been considered as an item whose production is restricted to the Public Sector only.

[Ministry of Defence, Department of Defence Production & Supplies O.M. No. 17(13)|85|D(BEL) dated 9th April, 1987.]

## CHAPTER IV

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

**Recommendation (Sl. No. 12, Paragraph No. 3.67)**

While viewing with concern the delay of two years that occurred in the implementation of the diversification programme, the Committee are unhappy that such an important requirement of providing specific time schedule in the scheme of diversification programme was lost sight of both by the Company as well as by the Ministry. The Committee are constrained to conclude that the Company had only envisaged target of production and target of investment and not any time schedule, which is of paramount importance for watching the progress end assessing the achievement in a realistic manner. The Committee, therefore, consider it as a clear case of lapse and desire that the matter should be enquired into with a view to fixing the responsibility.

**Reply of the Government**

A detailed note pertaining to the diversification programme has been submitted by the Company. (Appendix III).

From BEL's note, it appears that a time schedule was envisaged for the diversification proposal. Investment was to be done in phases, and the entire programme was to have turned BEL Ghaziabad into a profit making enterprise in a period of 3 years i.e. by 1978-79. A time schedule was given in the Project Report for the introduction of certain items of equipment. However, as most of the products transferred from BEL Bangalore for production in BEL Ghaziabad were new, the Company ran into many technical snags which could not be anticipated at the time the diversification programme was drawn up. As a result, the Company could not achieve the production level planned.

A thorough study of the circumstances and the manner in which the diversification programme was implemented reveals that it was due to circumstances beyond human control that delays occurred.

It is felt that an enquiry to fix responsibility is unlikely to bear any fruitful results.

[Ministry of Defence, Department of Defence Production & Supplies O.M. No. 17(13)|85|D(BEL) dated 29th October, 1986.]

**Vetting remarks of Audit**

"Cut of 5 items taken up under Diversification programme (2 items transferred from Bangalore Unit and 3 other items developed by other agencies), 4 items were given up by the Unit after incurring heavy losses. The profits earned by the Unit in later years were contributed by the items for which the Unit was originally set up."

**Comments of the Government on Audit remarks**

The entire diversification programme was taken up by BEL Ghaziabad as a result of the Defence Services' inability to load the Ghaziabad Unit as was anticipated at the time of setting up of Ghaziabad Unit. It was in order to utilise BEL Ghaziabad's capacity to the maximum extent possible that 5 items under various stages of development were taken-up for manufacture in Ghaziabad, of which 4 were ultimately given up by the Unit after incurring losses. By that time, however, the Unit had begun making profit.

**Comments of the Committee**

Please *see* paragraph 6 of Chapter I of this Report.

**Recommendation (Serial No. 13, Paragraph Nos. 3.68 and 3.69)**

The Committee have observed that though the diversification scheme for balancing Ghaziabad Unit was to be launched in 1975-76. a beginning in this regard was made only in 1976-77 and the Unit could not make any headway in achieving the increased production. This was due to the fact that none of the items transferred from the Bangalore Unit had been firmly established in the regular production line prior to transfer. Further in regard to productionisation of the items developed by other Agencies (including the Bangalore Unit) out of five items planned one meant for Defence did not reach the production stage as the development project itself was abandoned on the ground that the expected orders did not materialise. Another item under development at Bangalore Unit was not transferred but productionised there itself. In respect of the remaining three items, the production commenced only in 1976. During evidence, the represen-

tatives of the BEL also admitted that 'decision to transfer certain equipments to Ghaziabad proved wrong because of certain compulsions of the product mix at Ghaziabad Unit changing. This must have been an ideal thing if we had planned right in the beginning this product mix'.

The Committee are of the view that had the fully developed items been transferred from Bangalore to Ghaziabad Unit, machine brought from Bangalore Unit could have been put to use for production immediately after their installation and this would have helped in increasing the production. The Committee, therefore, are of the firm view that had the diversification programme been conceived carefully after mature consideration of all its aspects and implemented with a time bound programme, the losses incurred by the Unit from 1976-77 to 1979-80 could have been easily minimised, if not altogether avoided.

**Reply of the Government**

This recommendation pertains to the Diversification Plan of the Company's Ghaziabad Unit. A detailed note of the Company has been enclosed against recommendation No. 12. In the light of BEL's note, it is submitted that diversification programme had been conceived carefully but unfortunately due to the technical snags encountered during production of new products, production levels planned could not be achieved.

[Ministry of Defence, Department of Defence Production and Supplies O.M. No. 17(13)/85/D(BEL) dated 9th April, 1987.]

**Vetting remarks of Audit**

The technical snags encountered during production of a not completely developed product being not uncommon could have been anticipated and diversification conceived accordingly.

**Comments of the Government on Audit remarks**

The observations of Audit in the vetting remarks are agreed to and noted for action in future.

**Comments of the Committee**

Please *see* paragraph 6 of Chapter I of the Report.

**Recommendation (Serial No. 14, Paragraph Nos. 3.70 to 3.72)**

The Committee are informed that the P&T Department placed orders for 80 bays of UHF Radio Relay equipment with BEL in May, 1974 the quantity of order was increased to 104 bays in November 1976 at the instance of BEL. As per the term of agreement, the delivery was to commence within six months from the date of placement of orders and to be completed within 18 months (i.e., by November, 1975). The Committee are also informed that this equipment was originally to be manufactured in Bangalore Unit where it was designed and developed but under the scheme of balancing Ghaziabad Unit the manufacture of this item was transferred to Ghaziabad Unit in July 1975. The P&T Department was not in favour of this shifting of venue of manufacture as they apprehended delay in supplies and this was duly brought to the notice of the Company.

The Committee are further informed that the equipment manufactured by Bangalore and Ghaziabad Units was found to be not meeting the specifications and was having reliability problems when installed by the P&T Department. The equipment was, however, accepted by P&T Department after impressing upon BEL to meet the shortcomings pointed out by P&T Department. Due to the heavy delays in supply and due to the inability on the part of the BEL to manufacture the equipment to the original specification etc., P&T Department had to short-close the order upto 58 bays and went in for import of the equipment to meet their immediate requirements. P&T Department had also informed the Committee that even 5 years after the placement of firm orders, BEL could not supply by 1979 even 30 bays and wanted to increase the price by over 260 per cent i.e., Rs. 2.55 lakhs per bay against the original agreed rate of Rs. 0.97 lakhs per bay. As a result of cancellation of order by P&T Department, the Company suffered heavy losses.

The Committee are dismayed over this lackadaisical approach of the Company in not meeting the quality and price requirement of P&T Department for the supply of UHF equipment even after developing the equipment at a substantial cost of Rs. 35.64 lakhs and remaining in the filed for more than 6 years. When the defects noticed in the equipment were brought to the notice of the Company, these should have been attended to and rectified to the full satisfaction of their customer, i.e. P&T Department. As the P&T Department required the equipment for their immediate use. the Company ought to have made special efforts to supply the equipment within the time schedule. This inordinate delay of 16 months in the supply of equipment virtually forced the P&T Department to short close the order

and to go in for imports. The result was that the Company not only lost a good customer but also failed to arrest the foreign exchange drain caused by the import of equipment by P&T Department. The Committee find that the role of the P&T in this deal is also not spotless. The Committee fail to understand as to why P&T increased the order with BEL in 1976 when they had found after trial that the equipment supplied in 1975 was not according to specifications and was not working perfectly when installed.

**Reply of the Government**

A note relating to the development of the UHF multi-channel Radio Relay and the production and supply of the equipment by BEL as submitted by the Company is enclosed. (Appendix IV).

The Company has also submitted that there was close coordination between the Development Wings of P&T namely the TRC and BEL in the design and development of the equipment. The defects that came up during the course of development and production were indeed attended to, in association with the P&T. On the price aspect the Company has stated that reasonably accurate estimates could not unfortunately be made at the initial stage when orders were sought.

The supply of the equipment to the P&T had to be short-closed at a point of time when it was determined that the specifications were required to be improved upon and the designs could not cater to this new need.

P&T's resort to imports could also perhaps not be avoided from the operation angle.

The Company has also felt that it was necessary to have a healthy relationship between BEL and P&T for its operations as a commercial undertaking and hence had to accept the short-closure and the loss that were incurred in undertaking this project.

[Ministry of Defence, Department of Defence Production and Supplies O.M. No. 17 (13)/85/D(BEL) dated 9th April, 1987.]

**Comments of the Committee**

Please *see* Paragraph 12 of Chapter I of the Report.

**Recommendation Serial No. 15 (Paragraph No. 3.73)**

The Committee also agree with the comments of the Audit that in spite of the instructions issued by Government in May 1972 on the

recommendation of the Committee on Public Undertaking that the Company should have made a thorough analysis of demand and cost of production before undertaking manufacture of new item so as to minimise the losses, the Company embarked on this venture unsuccessfully and incurred huge losses. The Committee therefore, recommend that the whole issue may be thoroughly investigated with a view to fixing the responsibility and Committee apprised of the outcome of this enquiry.

**Reply of the Government**

BEL has reported that a demand existed for the multi-channel UHF Relay Equipment. Originally the production of 840 sets was planned. However changes occurred in P&T's specifications in the course of development. This resulted in the development getting prolonged and consequently the designs ceased to be cost effective. Though the Company incurred losses in this project, the indigenous development of the UHF Multi channel equipment was a pioneering venture conducted jointly by BEL and P&T. In para 3.58 of the Committee's Report, it is stated that the Deptt. of Electronics had informed the P&T that BEL's equipment was superior to the UHF System imported by the P&T. BEL had to short close its production due to P&T's requirement of higher specification equipment. Thus it is clear that BEL had kept both the demand and cost consideration in mind while embarking on this project and therefore it may not be necessary to investigate these aspects. Customer's satisfaction and a healthy relationship between the manufacturer and the customer are vital for BEL's operation as P&T is a major customer for BEL's products. As a Commercial Undertaking, BEL has some times to take chances when it has to supply equipment which is still at a developmental stage.

The development of the product was undertaken specifically for a customer which happens to be a government department. In such development and production programmes, at times the commercial results may not be always viable and satisfactory. Viewed in totality, holding an enquiry into this matter is unlikely to reveal anything new or pin-point an individual whose actions or decisions directly or indirectly resulted in some loss to the company.

[Ministry of Defence, Department of Defence Production and Supplies O.M. No. 17 (13)/85/D(BEL) dated 29th October, 1986.]

**Vetting Remarks of Audit**

"The development stage of the Radio Relay Equipment was over in 1973-74 and during 1974-75 to 1980-81, the equipments were in regular production and supply. The sets as designed, modified and supplied were defective and the customer, P&T, experienced 'Serious Problems in installing the equipment because of excessive faults arising during energisation'. Further, the equipment had ceased to be cost effective. These led to cancellation of orders by P&T for the quantities yet to be supplied and the non-supply as per delivery schedules led to imports of its requirements by the P&T".

**Comments of the Government on Audit remarks**

Regarding the contention that the UHF Radio Relay equipment manufactured by BEL for the P&T was defective and not cost effective, it may be stated that P&T (Telecommunication Research Centre, the technical Directorate of P&T) had approved the original model manufactured by BEL. Secondly, the customer, viz. P&T wanted the equipments to be more State-of-the Art with regard to the facilities and changes in specifications. With these changes in design, the equipment naturally ceased to be cost effective.

**Comments of the Committee**

Please see Paragraph 12 of Chapter I of the Report.

**Recommendation (Serial No. 16, Paragraph No. 3.74)**

The Committee are also surprised to learn that the imported UHF System in the southern region has shown worse performance than that of BEL equipment which was not cleared by P&T for production for nearly two years. The Committee also do not approve of the action of P&T for short-closing the order and going in for import of the equipment especially when their Technical Director had examined the equipment and had stated that it conformed to the specification and they (P&T) had approved the quality. Admittedly, the Company was working for P&T on an item which was new and had to be developed indigenously and for that there was no established collaborator. Keeping in view the general environmental conditions, P&T, being a Government agency, should have helped the indigenous production of the equipment. If they could not have relaxed their standard to some extent, they should have at least got the shortcomings in the equipment rectified rather than rushing for the import of the equipment which showed worse performance. The net result is that

due to poor performance of the BEL and imperfect planning of P&T Department the Country lost some good amount of valuable foreign exchange.

**Reply of the Government**

The circumstances leading to the short closure of the project by BEL and import of the equipment by P&T Department have already been explained in the replies to the recommendations 14 and 15.

[Ministry of Defence, Department of Defence Production and Supplies O.M. No. 17 (13)/85/D(BEL) dated 9th April, 1987.]

**Comments of the Committee**

Please see Paragraph 12 of Chapter I of the Report.

**Recommendation (Serial No. 26, Paragraph Nos. 3.157 to 3.159)**

The Committee were informed by the Company during evidence that even though the RCA was not the foremost company in the world but they did not have much choice at that time. The technology was available with the Japan and other foreign countries but at that time they were not prepared to part with it and the Collaboration Agreement in the circumstances was entered into with RCA only. As a result of this Agreement, the Company is reported to have obtained a qualitative gain with regard to ICs design, mask manufacture, wafer fabrication, ICs assembly and ICs testing etc.

The Committee have their own doubts with regard to the extent of gain achieved by BEL as a result of collaboration with RCA. On the other hand, the Secretary, Department of Defence Production, has admitted before the Committee during his evidence that "the pace of change in the technology in the area of ICs is so fast that we are nowhere".

Moreover, the Committee find that the Integrated Circuits produced in the Company are of a very elementary level of technology and cover medium scale integration (5000 to 10,000 circuits in a single chip) whereas currently the technology has advanced tremendously in this field in that very large scale (VLSI) and very very large scale (VVLSI) chips with several million circuits in a sigle chip, are being produced in the world. The Committee feel that the Company has totally failed to keep pace and update its technology even after a decade of experience and during this period, technology has progressed by several generations in the rest of the world.

**Reply of the Government**

The Company has stated that the order of investment needed to keep pace with technology in the area of ICs is very high and even many advanced countries have found such investments beyond their means. In India for manufacture of large scale and very large scale ICs (LSI and VLSI), the Government has set up the Semiconductor Complex in Chandigarh. The Company has also stated that the entire aspect of technological growth in the IC area is being examined by the National Micro Electronics Council set up by the Government (Department of Electronics).

[Ministry of Defence, Department of Defence Production and Supplies O.M. No. 17 (13)/85/D(BEL) dated 9th April, 1987.]

**Comments of the Committee**

Please see Paragraph 19 of Chapter I of the Report.

**Recommendation (Serial No. 27 Paragraph No. 3.160)**

The Committee were informed during evidence that the demand for ICs was calculated by BEL on the basis of the requirements of ECIL and ITI, the two main professional manufacturers who were then told of the range of ICs being manufactured by BEL. The ECIL and ITI accordingly indicated their quantity and the time frame which formed the basis for acquiring designs know-how from the RCA. The development plans of ECIL and ITI did not, however, materialise as the same were overtaken by the latest advanced developments. The demand expectation, therefore, did not materialise. Even when the very basis on the strength of which collaboration agreement was entered into with RCA had changed, the BEL not only continued the arrangement but even the agreement was extended for another 10 years after it had expired in 1981. The Committee are not happy over this and feel that the BEL instead of extending the collaboration agreement with RCA should have explored the possibility of acquiring know-how and the latest IC technologies from some other sources in USA or Japan to meet effectively the present and future requirements of country.

**Reply of the Government**

A detailed note covering all the aspects concerning the initial

agreement with RCA as well as its later extension has been dealt with in detail in reply to the recommendation No. 28 following.

[Ministry of Defence, Department of Defence Production & Supplies No. 17(13)|85|D(BEL) dated 9th April, 1987.]

**Vetting remarks of Audit**

As already stated, Indian Telephone Industries Ltd., has set up the state of art process without foreign collaboration, for manufacturing of the most advanced technology being LSI/VLSI and hence, they may have no longer the need for the Bharat Electronics Ltd's manufacturing facility of SSI and MSI grade ICs.

**Comments of the Government on remarks of Audit Department of Defence Production & Supplies**

The need for BEL to have IC facilities has been explained in the reply of the Government against recommendation S. No. 24. It may please be reiterated that the Company requires IC facility to be located in-house even though there may be other IC manufacturing units in the country. The growing demands for ICs for use on Defence and civilian equipment within BEL as well as the professional and consumer electronics market in the country justifies setting up of in-house development facilities in BEL even though other Companies like ITI may not require ICs from BEL.

**Comments of the Committee**

Please see Paragraphs 19 of Chapter I of the Report.

**Recommendation (Serial No. 28, Paragraph No. 3.161)**

The Committee are surprised to note that even after 14 years of collaboration with RCA and also after having spent huge amount, the total technology for the manufacture of ICs available with RCA has not been made available by BEL. The design and production information has been obtained only in respect of 50 per cent of the types being produced by the collaborators. As a result, BEL has naturally to depend on imports for its own in-house requirements. The Committee find that neither the BEL nor the Government have been sufficiently vigilant and far sighted so far as creation of capacity for manufacture of ICs is concerned. After spending lot of funds the achievement is only just like a drop in the ocean. The Commitee, thereore, recommend that the whole issue as to how the Collaboration Agreement with RCA was originally

entered into and why the agreement was extended when the technology available from them was not proving to be of any material help should be examined by an independent body and the Committee apprised of the result of such examination.

**Reply of the Government**

The Company has submitted to the Government a detailed note on ICs. The Company's note has been gone into in details by the Govt. The Government has noted that the original agreement with RCA was entered into by the Company based on the technology considerations after an assessment by a High Level Technical Committee headed by the then Scientific Adviser, Dr. S. Bhagavantham. The IC technology was an emerging area at that point of time as a technology leap over the discrete devices and the Company had rightly felt that it should also enter this realm of technology. The Company has also pointed out that even at the time of entering into the agreement the Company's Board has noted that IC Project was essential from technological ang'e and the total Semiconductors operation of the Company would be required to be viewed as a whole, from viability point of view.

The Company has brought out that it would not be correct to state that the technology available from RCA was not of material help while seeking to extend the Licence Agreement for a further period. The Company had desired technology from RCA during the closing period of the original agreement for certain devices covering technologies such as CMOS/SOS (primarily for Defence and Professional electronics), closed call logic CMOS (C21), Integrated Injection Logic CMOS (I2L), Low Voltage AI gate (LVOS) CMOS, etc. The Mask drawings in respect of the specific devices asked for using the relevant technologies were also obtained by the Company from RCA, once the agreement was got extended after due consideration and approval by the Department of Electronics and the Foreign Investment Board.

The Company has also brought out that this extension in the agreement has enabled the Company to bring out new types of devices such as those required for Colour Television Receivers.

The circumstances narrated in the proceding paragraphs throw light on the necessity for the arrangement made for entering into the original collaboration with RCA and the subsequent extension to the Licence Agreemnet. Absorption of sophisticated Bipolar

and CMOS technologies was important for meeting the requirements of the Defence Forces. In view of this, an enquiry into the collaboration agreement is hardly likely to come to any conclusion which could serve as a guideline or yardstick for future collaborative arrangements.

[Ministry of Defence, Department of Defence Production and Supplies O.M. No. 17 (13)/85/D(BEL) dated 29th October, 1986.]

**Vetting remarks of Audit**

"In view of the essentiality of the parameters for a viable justification for the IC Project, viz. a strong domestic demand, a vast global market and clossal investments in R & D and technology, the decision taken originally in 1971 to take RCA's collaboration has to be seen in the light of the facts that apart from technology acquisition, the IC project has not proved viable. Even the totality of the semi-conductors production (germanium and silicon semiconductors and power devices, ICs and Hybrid Micro Circuits) in the Company has led to losses of Rs. 180.00 lakhs, Rs. 289.39 lakhs and Rs. 270.27 lakhs in 1982-83, 1983-84 and 1984-85 respectively.

During 10 years covered by the original collaboration agreement the Company obtained design and production information for only 42 to 51 per cent of the types of ICs covered by the original collaboration agreement. Further, due to limited process capabilities and market constraints, only a few types have been standardised on production. Even these have been of only SSI/MSI complexity."

**Comments of the Government on Audit remarks**

Large scale production as anticipated could not materialise thereby affecting the commercial viability of project.

**Further remarks of Audit**

While the achievement after the extension of the agreement are stated, the specific need for extension has not been clearly pronounced.

**Further comments of Government on Audit remarks**

To keep abreast with the change in technology in the field of ICs, it was felt necessary to continue collaboration to maintain and

update in. House capability for manufacture of ICs. Informal enquiries indicated that for the level of technology of ICs and related field and payment for collaboration required was of very high order. In this background continuing collaboration with RCA was considered inescapable course of action.

**Comments of the Committee**

Please see Paragraph 19 of Chapter I of the Report.

NEW DELHI;
*April* 29, 1987
*Vaisakha* 9, 1909 (*S*)

K. RAMAMURTHY,
*Chairman,*
*Committee on Public Undertakings*

## APPENDIX I

*Minutes of the 77th sitting of the Committee on Public Undertakings held on 24 April, 1987*

The Committee sat from 15.30 hrs. to 16.30 hrs.

PRESENT

Shri K. Ramamurthy—*Chairman*

MEMBERS

2. Chowdhry Akhtar Hasan
3. Shri Dinesh Goswami
4. Shrimati Sheila Kaul
5. Shri Satyagopal Misra
6. Shri Braja Mohan Mohanty
7. Shri K. R. Natarajan
8. Shri K. Ramachandra Reddy
9. Shri Chiranji Lal Sharma
10. Shri Jagesh Desai
11. Shri Krishna Nand Joshi
12. Prof. C. Lakshmanna

SECRETARIAT

1. Shri N. N. Mehra—*Joint Secretary*
2. Shri G. S. Bhasin—*Senior Financial Committee Officer*
3. Shri Rup Chand—*Senior Financial Committee Officer*

2. The Committee first considered and adopted the following Action Taken Reports, as approved by the Action Taken Sub-Committee:—

(i) Action Taken by Government on the recommendations contained in the 9th Report (1985-86) of CPU on Bharat Electronics Ltd.— Objectives and Implementation of Projects.

(ii) * * * * * *

3. * * * * * *

4. The Committee authorised the Chairman to finalise the draft Reports on the basis of factual verification by the Ministries & Undertakings concerned and Audit and present the same to Parliament.

The Committee then adjourned.

## APPENDIX II

*Synopsis on Corporate and Plans (1979—86) and Achievements*

Ref : BEL'S Corporate Plan of 1979

| Para Reference in Plan | Objectives of Policy and Micro-objectives | Achievements *vis-a-vis* this Corporate Plan |
|---|---|---|
| | I *Broadbasing of Production Activities* | |
| 2.1 | Broadbase its production activities | This has been achieved. For details refer Part B of Annex. |
| 3.1.1 | Strengthening of operations in specific equipment areas | |
| 3.1.2 | Efforts in active components and enlarge its activities in specified products | |
| | II *Growth* | |
| 2.2 | Aim at a growth rate of 10 to 12 per annum inrands to keep its options open with regard to mergers and acquisitions | From a production turnover of Rs. 85 05 crores in 1979-80, a turnover in 1985-86 of Rs 225 90 crores has been achieved. This works out to a growth rate of 17% per annum. At the point of submission of the Plan a projected growth rate of 10—12% was made taking into account creation of additional production capacities with the setting up 2 new equipment factories and production of Glass Shells for the TV Picture Tube. Since sanctions came late, the implementation got delayed. However, the Company has been able to exceed its turnover and growth projections and achieve its objectives. Regarding details for growth, acquisitions, etc refer to Part B of Annex. |
| 3.2.1 | To provide for growth, proposals for setting up two new equipment fatories have been put up | |
| | III *Technological Leadership and strengthening of R & D* | |
| 2.3 | Leadership in electronics should be preserved. R & D efforts will be strengthened. Yearly investment on R &D to be 5% of its turnover. | The objective of 5% on R & D investment has been achieved as detailed below :— |
| 3.3.1 | | |
| 3.3.2 | | |

| Year | % Investment |
|---|---|
| 79-80 | 7.8 |
| 80-81 | 7.6 |
| 81-82 | 8.1 |
| 82-83 | 7.4 |
| 83-84 | 8.1 |
| 84-85 | 8.2 |
| 85-86 | 5.8 |

Regarding details on R & D activities refer to Part B of Annex.

Ref : BEL's Corporate Plan of 1979

| Para Reference in Plan | Objectives of Policy and Micro-objectives | Achievements vis-a-vis this Corporate Plan. |
|---|---|---|
| | IV *Financial* | |
| 2.4 | The financial objcective will be a return on networth as prescribed by the Govt. for Public Sector | According to Govt. guidelines on profit in Public Sector Enterprises, the minimum rate of return on networth should be around the Bank deposit rate of interest on fixed deposit of 5 years or more, which at present is 11%. The actual year-wise has been : |

| Year | Profit after Tax to Networth %) |
|---|---|
| 79-80 | 8.3 |
| 80-81 | 9.06 |
| 81-82 | 15.4 |
| 82-83 | 14.7 |
| 83-84 | 17.7 |
| 84-85 | 13.35 |
| 85-86 | 11.15 |

It may be seen that the objective has been achieved.

| | | |
|---|---|---|
| | In respect of special Defence Projects, the Company will propose an arrangement with Govt. that should Defence Projects not materialise as planned, the finanical liability will be assumed by it and the Company will be reimbursed the net expenditure. | There has been one instance where the Company has had to seek a compensation from the Government (pertaining to the setting of production facilities for Image Converter Tubes at Pune). This is under examination by the Government. |
| 3.4.1<br>3.4.2 | BEL will make a Capital investment of Rs. 100 crores and Govt. support will be of the order of around Rs. 44 crores. | Actual Capital investment has been Rs. 139.46 crores and Govt. support has been around Rs. 75.95 crores. |
| 3.4.3 | There will be no significant drop in the profit margin and returen on networth. The company will be able to maintain a dividend rate of 12% | The values of profit after tax and networth are indicated below : |

(Rs. in lakhs)

| Year | Profit After Tax | Networth |
|---|---|---|
| 79-80 | 301 | 4594 |
| 80-81 | 470 | 5264 |
| 81-82 | 938 | 6108 |
| 82-83 | 1021 | 6946 |
| 83-84 | 1494 | 8434 |
| 84-85 | 1447 | 10678 |
| 85-86 | 1445 | 12957 |

The Company has achieved its objective on profit/networth.

Ref. BEL'S Corporate Plan of 1979

| Para References in Plan | Objectives of Policy and Micro-objectives | Achievements *vis-a vis* this Corporate Plan |
|---|---|---|
| | | The Company has been paying a dividend rate of 12 % throughput the period, thereby achieving its objective. |
| | V *Increasing employment Opportunities.* | |
| 3.5 | Increase in personnel by about 7100 during 1979—86 | The actual increase has been 3029 personnel (1810 Nos. in the existing units, 956 h No. in the unit acquired by the Company at Machilipatnam and others in the other establishments under formation. Details have been given in Annex 'A' Part 'B') The shorfall is mainly due to the delay in sanction for the two new equipment factories. |
| 3.5.3 | It is anticipated that nearly 15 to 20 % of the additional work force will be of educated women. | The women constituting the additional work force inducted during this period has been around 11 % |
| | VI *Support to Ancillaries and Small Scale Sector* | |
| 2.6<br>3.6 | Development of ancillaries and small scale sectors | Details as in Annex 'A', Part 'B'. |
| | VII *Increase in Export Efforts* | |
| 2.7 | Exports : A target of 10 % of turnover per year will be aimed at as soon as the capacity is augmented with the setting up of the 2 new factories. | Since the sanction for the two new equipment factories was delayed the capacity constraint on exports affected the export performance Consequently, the Company could achieve an averaged export performance of only 3 5 % per year during the period 1979—86 as against the 10 % planned. |
| 3 7.2 | Plan for Project Exports and setting up electronic factories in certain other countries. | Though action was initiated and discussions has taken place. the company was not successful in achieving a breakthrough in Project Exports and setting up electronic factories in other countries. |

# BHARAT ELECTRONICS LIMITED

## CORPORATE OBJECTIVES AND PLANS.

## (1979—86)

## PROJECTIONS AND ACHIEVEMENTS

## CONTENTS

## INTRODUCTION

India is one of the few third world countries having a strong base for development and manufacture of professional grade Electronic Equipment and Components. Public Enterprise Bharat Electronics Limited can rightly claim to have contributed significantly in this regard.

BEL was incorporated in 1954 as a fully owned Government of India undertaking under the administrative control of the Ministry of Defence. Today, it has production units at Bangalore, Ghaziabad, Pune and Machilipatnam. 5 more Units|Establishments are being set up at Taloja (Maharashtra), Panchkula (Haryana), Kotdwara (Uttar Pradesh), Hyderabad (Andhra Pradesh) and Madras (Tamil Nadu)

In 1979, BEL had submitted its Corporate Objectives and Plans covering a seven year period (1979—86) to the Bureau of Public Enterprises (with the then Ministry of Finance) and copy to Ministry of Defence (Department of Defence Production). A copy of that Plan as well as the revised objectives formulated and approved by the Board in 1983 are placed at Part 'A', (List 1 and 2) of this paper. Part 'B' of this paper examines the actual achievements of the Company when related to the objectives and plans as contained in Part 'A'. The procedure followed for this write-up is to list out the para Nos. referred to in the Objectives (Part 'A') and then indicate the achievements para-wise.

This paper has been prepared as recommended in Para 2.28, Page 20 of the 9th Report of Committee on Public Undertakings 1985-86 on Bharat Electronics Limited--Objectives and Implementation of Projects—submitted to Parliament on 29th April 1986.

PART 'A' — LIST-I

# CORPORATE OBJECTIVES & PLANS

(1979—86)

## BHARAT ELECTRONICS LIMITED

Regd. Office : TRADE CENTRE,
29/4, Race Course Road,
Bangalore-560 001.

## BHARAT ELECTRONICS LIMITED

## CORPORATE OBJECTIVES

### I. BACKGROUND

1.0 BEL was established as a fully owned Government of India undertaking in the year 1954 under the administrative control of the Ministry of Defence. The role assigned to BEL was to meet the requirements of Defence Services and Civil Government Departments for professional electronic equipments, through indigenous production. BEL was also charged with production of specialised components for the entertainment electronics industry in the country which was in its very nascent stages at that time.

1.1 BEL has been able to successfully achieve during the years the establishment of a sound development engineering and production base in the country in the sophisticated field of professional electronics and assume the mantle of leadership in this field. The story of the Company over the last 25 years of its existence—this is the Silver Jubilee year—has been one of steady growth in all aspects (except for a few years at the beginning stages).

The Annual Report of the Company for the last year (1978-79), provides the financial picture of the Company and its growth profile over the last decade.

1.2 In drawing up its Corporate Plans for the future, consistent with the broad macro objectives set forth in the Industrial Policy statement of the Government in November 1977,—BEL has to be governed by the specific policies decided year to year by the Department of Electronics and the Ministry of Defence of the Government relating to the electronics field.

BEL manufactures highly sophisticated electronic items required by the Defence Services as well as the Civil Government Departments such as the Civil Aviation, the P & T, All India Radio|Doordharsan, the Railways, the Home Ministry (Police Wireless) etc. Fur-

ther, BEL's production plans in many cases may have to take into account strategic considerations and be not necessarily governed by purely commercial considerations.

1.3 In the electronic Components field, the future plans would be conditioned by the growth profile in the private and joint sector, with regard to which policies relating to aspects such as liberalisation or otherwise in the grant of licences, import policies of the Department of Electronics etc. are decided upon from year to year. BEL's role will primarily be in the area of high technology development and production, specially in the field of active devices.

## II OBJECTIVES OF POLICY

2.0 The Company has set itself the following policy of objectives for the coming 7 to 8 years, keeping the above background in view:—

2.1 Broad base its production activities to enable the production and supply of important and strategic electronic equipment and components required by the Defence Services and other Government Departments.

2.2 Aim at a growth rate of 10 to 12 per cent per annum with the diversified product and technology base. The necessary organisation structure will be strengthened to support this growth. The Company also intends to keep its options open with regard to mergers and acquisitions wherever opportunities occur and consistent with Government's proposals|approvals.

2.3 The leadership in Electronics which BEL has acquired should be preserved and both production technology as well as design of the equipment should meet international standards. For this purpose, BEL will strengthen its R & D effort to the extent possible by internal resources. It wil also acquire know-how especially with respect to export programmes.

2.4 The financial objective will be a return on Net Worth as prescribed by the Government for Public Sector. In respect of special Defence Projects the Company will propose an arrangement with the Government that should the Defence Projects not materialise as planned, the financial liability will be assumed by it and the Company will be re-imbursed the net expenditure including interest on capital.

2.5 Increase the employment from the present level of 16000 personnel to about 23000 personnel in the period of 7 to 8 years and in different locations without undue concentration.

2.6 Give full and maximum support to the development of the ancillaries and small scale sector.

2.7 Increase its export efforts. (A target of ten per cent of turnover per year towards exports will be aimed at).

## III. MICRO OBJECTIVES FOR ACHIEVING THE POLICY OBJECTIVES

3.1 *Broad basing Company's production activities:*

3.1.1 The Company is presently engaged in the manufacture of over 350 items of Electronic Equipment and Components covering the very wide range of the radio spectrum. The types of products in the equipment and components field under production in BEL are given in Appendices 1 and 2 respectively. The product mix of BEL will be up-dated and modern equipment of latest designs developed, engineered and produced. In addition to this effort in the development and supply of equipment conforming to the "state-of-art" abroad, BEL intends to strengthen its operations in the following specific equipment areas:—

(a) Senar Systems

(b) High Power Medium wave/short wave broadcast equipments

(c) Communication Systems for P & T

(d) Satellite Terminals

(e) Laser Systems for communication and other applications.

(f) Antena Systems.

3.1.2 Similarly in the Electronic Components area, BEL proposes to concentrate further efforts in active components and specifically enlarge its activities in the following types of products:—

(a) New devices in Germanium and Silicon Semi Conductor and in IC Technology Cells and in Solar Cells

(b) New thick and thin film micro-circuits

(c) X-ray tubes

(d) Vacuum switches

(e) Display tubes

(f) Mg MHQ Batteries

(g) High Power Transmitting Tubes

(h) Klystrons

(i) Imaging Devices

(j) Class Spells for Picture Tubes

3.1.3 Action for the development/acquisition of technology for many of the items given above has already been initiative by the Company.

3.2 Aiming for a growth rate of 10 to 12 per cent per year.

3.2.1 In planning for a growth rate of 10 per cent to 12 per cent per year, BEL is optimistic that—notwithstanding the present set back this year in the overall industrial growth—conditions will soon prevail whereby the requirements for professional electronic equipment and components will increase significantly and in keeping with the trends in other countries. The order-book position of the Company for its goods its full at present and the existing capacity is booked for a 3 year period. To provide for growth, BEL submitted to the Government (more than 18 months ago) its project proposals for creation of additional production capacities for equipment production, by way of setting up of two new Factories. The proposals are presently engaging the serious attention of the Government. Similarly, in the Components area, BEL has submitted to the Government a proposal for production of Glass Shells for TV Picture Tubes. It is anticipated that the necessary approvals will be available to BEL within the next 2 to 3 months for these Projects. Providing for the gestation period for these new factories, the product turnover growth profile

of the Company is expected to have the following pattern:—

| Year | 79-80 | 80-81 | 81-82 | 82-83 | 83-84 | 84-85 | 85-86 |
|---|---|---|---|---|---|---|---|
| Turnover Rs. in Crores | 100* | 114 | 120 | 135 | 152 | 167 | 178 |

(Note: *The earlier proposal for a turnover of Rs. 100 crores for the current year 1979-80 is being revised downwards due to problems faced by the Company in various fronts such as labour, power supply shortage, technical problems involved in certain new product lines etc. It is likely that the turnover for the year would be in the region of Rs. 85 crores).

3.3 Technological leadership and strengthening the R & D base

3.3.1 BEL has established a sound R & D base in the organisation and most of the products presently manufactured by the Company are those which have been indigenously designed and developed. A copy of the Design and Development Report (1978) of the Company is enclosed (Enclosure III) and this would indicate the wide spactrum of the R & D activities the Company is presently engaged in, and the technological advances made in the recent years.

3.3.2 The Company has accepted the norm that 5 per cent of the turnover should be the yearly investment for the R & D activities. BEL will be further strengthening the capital facilities for R & D work by means of Test Equipment, prototype facilities etc. and investments periodically will be made to keep abreast with the 'state-of-art' in electronics technology.

3.3.3 It may become necessary for the Company also to acquire technology from others in certain specialised fields, and the Company will pursue such proposals where relevant in full consultation and approval of the Government.

3.4 Financial objectives

3.4.1 In aiming for the growth indicated in the previous paras, BEL proposes to make a Capital Investment of Rs. 200 Crores in the next seven to eight year period. This Capital will comprise of:—

(a) Rs. 30.50 crores on two new equipment factories to be set up;

(b) Rs. 25.00 crores for the Class Bulbs Factory to be established;

(c) Rs. 45.00 crores in the existing units (at Bangalore, Ghaziabad and Pune) towards replacements, renewals, modernisatioin, additions, and R & D sugmentation.

3.4.2 A little more than half the funds would be met by Company from its own internal resources and the Government support sought —by way of its extending long term credits—only to an extent of around Rs. 44 crores (out of the total of Rs. 100 crores).

3.4.3 A financing plan has been drawn up and is given in Appendix 3. The projected balance sheet and profit and loss account statement of the Company as a whole are given in Appendices 4 and 5 respectively. It could be seen therefrom that, despite the strain of the heavy investments, there will be no significant drop in the profit margin and return on Net Worth. The Company will also be able to maintain the current dividend rate (12 per cent) right through the period from current earnings alone, without having to draw upon its reserves.

3.4.4 The Company would continue to ensure that a sound and rational pricing policy is followed for its products so as to ensure that the customer obtains a quality product to international standards and specifications at a resonable price. Most of BEL's products stand very good comparison with prices prevailing in international markets, as is also evidenced by the export orders being obtained by the Company against international competition. The Company's prices for its products are accepted by the various user Government departments/industrial manufacturers, based on a close commercial scrutiny. For many of its products where competition is involved, BEL's pricing acts as a stabilising and controlling factor in the retail market BEL will continue to play this important stabilising role in rational control of market prices for such items, in close and active consultation of the Governmental agencies, where relevant.

3.5 Increasing employment opportunities

3.5.1 The present strength of BEL is around 16000 personnel made up of:—

| | |
|---|---|
| Bangalore Unit | 13831 |
| Ghaziabad Unit | 2193 |
| Pune Unit | 70 |
| Total | 16094 |

**3.5.2 The following additional personnel would be required for the growth envisaged:**

| | |
|---|---|
| Bangalore Unit | only marginal addition |
| Gaziabad Unit | 1000 personnel |
| Pune Unit | 400 personnel |
| Two New Equipment Factories planned | 5000 personnell |
| Class Bulbs Factory | 400 personnal |
| Other supporting personnel for the expansion programme | 300 personnel |
| Total : | 7100 personnel |

**3.5.3** The personnel required for the professional electronics industry are of the highly skilled and educated category and a significant portion will comprise of well qualified engineers and specialists in the field. It is anticipated that nearly 15 to 20 per cent of the additional work force will be of educated women.

**3.6** Support to development of ancillary units and small-scale sector

**3.6.1** BEL provides active support to the ancillary and the small scale sector by imparting technical know-how where possible and required and rendering active assistance with regard to material. BEL has set up an ancillary estate at the Bangalore Unit with fourteen industries engaged in activities such as castings, plastic moulding, rubber moulding, sheet meotal work, machining, industrial tailoring, painting, printing etc.

**3.6.2** A number of small industries receive the patronage of BEL both for sub-contracts and for purchases. Annually, about fifteen thousand itmes worth Rs. 2 crores are purchased by BEL from these small scale units.

**3.6.3** BEL will continue to pursue the above policy of encouragement and when the new units of BEL got established, a further impetus to the development of the small scale and ancillary industries will be given.

**3.7** Increase in Export efforts

**3.7.1** BEL has been able to achieve a break through in its export efforts in the last 3 years and in the field of sophisticated defence electronics. The Company's export efforts are however presently constrained by availability of production capacity and the priority needs

of our own internal customers (Defence Services). As soon as the capacity is augmented with the setting up of the two new factories planned, it will be possible to give a thrust on the export front and aim at a target of 10 per cent of the total turnover towards exports.

3.7.2 The Company is also planning to enter the field of Project Exports and collaborate with certain countries in the setting up of electronic factories in their areas. Discussions have already been initiated in this regard and the Company hopes to succeed in this front shortly. Asuccess in these efforts will be a major achievements and will bring international recognition to India in its ability to complete with developed countries in the highly sophisticated and complex field of professional electronics.

(Ref. Para 3.1.1 )

TYPES OF EQUIPMENT PRODUCED

| AIR-BORNE EQUIP-MENT | COMMUNI-CATION | RADARS | NAVIGA-TIONAL AIDS | GUN CONTROL | SPECIALISED EQUIPMENT |
|---|---|---|---|---|---|
| — Airborne Trans-receivers | — Communi-cation Transmit-ters, Receivers and Trans-receivers | — Fire Control Radars | - Beacon Transmit-ters | - Gun Control Equipment for Tanks | - Computers for Anti-Submarine Warfare applica-tions. |
| — Airborne DF equip-ment | - Mobile Transmit-ting Station | - Surviel-lance Radars | - VIIF Omni Range | - Amplifiers for Guns | - Automatic Test Equipment |
| | - Tropos-catter equipment | - Navigation Radars | - Distance Measuring Equipment | | |
| | - Broadcast Transmitters | - Miteoro-logical Radars | | | |
| | - TV Trans-mitters and Studio equipment | — Sonars | | | |
| | — Sound Broadcast Studio equipment | | | | |

(Ref. Para 3.1.1)

TYPES OF COMPONENTS PRODUCED

| PASSIVE COMPONENTS | OPTO-ELECTRONIC DEVICES | SEMICONDUCTORS AND INTEGRATED CIRCUITS | ELECTRON TUBES |
|---|---|---|---|
| —Pieso Electric Crystals | — Image Convertors | —Germanium Transistors for Radios | —Receiving Valves for Radios |
| —Ceramic Capacitors | —Image Intensifiers | —Silicon Transistors for Radios | —Transmitting Tubes |
| —Transformers and Coils | | —Silicon Transistors for Military use | —TV Picture Tubes |
| | | - Power Transistors for Military and Civil use | - X-ray Tubes |
| | | - Integrated Circuits for Military and Civil use | - Magnetrons |
| | | - Hybrid Microcircuits | |

(Ref. Para 3.4.3)

FINANCING PLAN

(*Rs. in lakhs*)

| | Particulars | 1979-80 | 1980-81 | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. |
| 1. | *REQUIREMENT OF FUNDS* | | | | | | | |
| 1. | *Capital Expenditure* | | | | | | | |
| 1.1 | Bangalore Complex | 491 | 736 | 636 | 427 | 531 | 453 | 455 |
| 1.2 | Ghaziabad Unit | 145 | 50 | 50 | 55 | 40 | 40 | 40 |
| 1.3 | Pune Unit | 60 | 5 | 20 | 20 | 20 | 20 | 20 |
| 1.4 | New Factory-I | 50 | 330 | 446 | 307 | 217 | 115 | 85 |
| 1.5 | New Factory-II | 60 | 330 | 421 | 282 | 217 | 115 | 85 |
| 1.6 | Glass Bulb Project. | 174 | 232 | 1432 | 662 | .. | .. | .. |
| 1.7 | Others | 20 | 10 | 10 | 10 | 10 | 10 | 10 |
| | TOTAL CAPITAL EXPENDITURE | 1000 | 1683 | 3015 | 1763 | 1035 | 753 | 695 |
| 2. | Addition to working capital | | .. | .. | 4 | 37 | 446 | 578 |
| 3. | Loan repayment | 155 | 195 | 221 | 479 | 134 | 136 | 149 |
| | TOTAL REQUIREMENT OF FUNDS | 1155 | 1888 | 3236 | 1946 | 1206 | 1335 | 1422 |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|---|---|---|---|---|---|---|---|---|
| II. | *SOURCES OF FINANCE:* | | | | | | | |
| 1. | Internal Resources: | | | | | | | |
| 1.1 | Retained Profit | 320 | 470 | 292 | 128 | 272 | 465 | 502 |
| 1.2 | Depreciation | 561 | 625 | 725 | 800 | 70 | 3870 | 920 |
| 2. | Share Capital | 190 | 330 | 1020 | 490 | 20 | | |
| 3. | Government loans | 84 | 463 | 1199 | 528 | 84 | | .. |
| | TOTAL SOURCES OF FINANCE | 1155 | 1888 | 3236 | 1946 | 1206 | 1335 | 1422 |
| III. | *DEBT, EQUITY POSITION:* | | | | | | | |
| 1. | Loans outstanding | 1589 | 1857 | 2835 | 3184 | 3134 | 2998 | 2849 |
| 2. | Equity Share Capital | 1190 | 1520 | 2540 | 3030 | 3050 | 3050 | 3050 |
| 3 | Reserves | 3443 | 3913 | 4205 | 4335 | 4605 | 5070 | 5572 |

Under revision

(Ref. Para 3.4.3)

BHARAT ELECTRONICS LIMITED

PROJECTED BALANCE SHEET

*(Rs. in lakhs)*

| | Particulars | 1979-80* | 1980-81 | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 |
|---|---|---|---|---|---|---|---|---|
| I. | *ASSETS* | | | | | | | |
| 1.1 | FIXED ASSETS . . . . . | | | | | | | |
| 1.1.1 | Gross Fixed Assets (including capital W.P) | 7146 | 8807 | 11790 | 13491 | 14526 | 15379 | 15974 |
| 1.1.2 | Accumulated Depreciation . . . | 4182 | 4807 | 5532 | 6332 | 7162 | 8092 | 8952 |
| 1.2.3 | Net Fixed Assets . . | 2964 | 4000 | 6258 | 7159 | 7364 | 7287 | 7022 |
| 1.2 | CURRENT ASSETS | | | | | | | |
| 1.2.1 | Inventory . . . . | 9740 | 10848 | 11206 | 11111 | 11854 | 11771 | 11963 |
| 1.2.2 | Sundry Debtors . . . | 1600 | 1850 | 2040 | 2560 | 2910 | 3140 | 3360 |
| 1.2.3 | Cash and Bank Balances | 420 | 400 | 370 | 400 | 425 | 425 | 450 |
| 1.2.4 | Loans and advances . | 710 | 730 | 780 | 820 | 880 | 960 | 920 |
| | TOTAL ASSETS | 15424 | 17828 | 20654 | 22050 | 23433 | 23583 | 23715 |

*Under revision

(*Rs. in lakhs*)

| | Particulars | 1979-80 | 1980-81 | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 |
|---|---|---|---|---|---|---|---|---|
| 2. | *LIABILITIES* | | | | | | | |
| 2.1 | SHAREHOLDERS' FUND | | | | | | | |
| 2.1.1 | Share Capital Equity | 1190 | 1520 | 2540 | 3030 | 3050 | 3050 | 3050 |
| 2.1.2 | Interest | 3443 | 3913 | 4205 | 4333 | 4605 | 5070 | 5572 |
| 2.2 | LONG TERM LOANS FROM GOVERNMENT: | | | | | | | |
| 2.2.1 | Loans Received | 2892 | 3355 | 4554 | 5082 | 5166 | 5166 | 5166 |
| 2.2.2 | Cumulative Repayments | 1303 | 1498 | 1719 | 1898 | 2032 | 2168 | 2317 |
| 2.2.3 | Loans outstanding | 1589 | 1857 | 2835 | 3184 | 3734 | 2998 | 2849 |
| 2.3 | CURRENT LIABILITIES | | | | | | | |
| 2.3.1 | Bank Borrowings | 2100 | 2670 | 2850 | 2920 | 3150 | 2800 | 2600 |
| 2.3.2 | Other Current Liabilities | 7112 | 7868 | 8224 | 8583 | 9494 | 9665 | 9644 |
| | TOTAL LIABILITIES | 15434 | 17828 | 20654 | 22050 | 23433 | 23583 | 23715 |

(*Ref.* Para 3.4.3)

BHARAT ELECTRONICS LIMITED

PROJECTED PROFIT & LOSS STATEMENT

*(Rs. in lakh)*

| | Particulars | 1979-80 | 1980-81 | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 |
|---|---|---|---|---|---|---|---|---|
| 1. | INCOME | * | * | | | | | |
| 1.1 | Turnover | 10000 | 11400 | 12000 | 13540 | 15170 | 16740 | 17830 |
| 2. | EXPENDITURE | | | | | | | |
| 2.1 | Raw materials & Intermediates | 4414 | 4288 | 5274 | 5864 | 6362 | 7877 | 7353 |
| 2.2 | Salaries & Wages | 2235 | 2475 | 2605 | 2892 | 3092 | 3319 | 3551 |
| 2.3 | Selling Expences | 175 | 200 | 210 | 237 | 265 | 293 | 312 |
| 2.4 | Other Expences: | | | | | | | |
| | —Depreciation | 561 | 625 | 725 | 800 | 830 | 870 | 920 |
| | —Interest | | | | | | | |
| | a) On Government Loan | 150 | 172 | 235 | 301 | 316 | 307 | 292 |
| | b) Cash Credit | 192 | 250 | 265 | 290 | 300 | 270 | 240 |
| | —Other Revenue Expenses | 1539 | 1661 | 1769 | 2304 | 2635 | 2952 | 3216 |
| | Total | 9266 | 10271 | 11083 | 12688 | 13800 | 14888 | 15884 |

*Figure under revision

*PROJECTED PROFIT & LOSS STATEMENT* (*Contd*)

(*Rs. in lakhs*)

| | Particulars | 1979-80 | 1980-81 | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 |
|---|---|---|---|---|---|---|---|---|
| 3. | PROFIT BEFORE TAX . . . | 734 | 1129 | 917 | 852 | 1370 | 1852 | 1946 |
| | Provision for Taxation . . . | 282 | 497 | 382 | 391 | 732 | 1021 | 1078 |
| 4. | PROFIT AFTER TAX . . | 452 | 632 | 535 | 461 | 638 | 831 | 868 |
| 5. | *APPROPRIATIONS* | | | | | | | |
| 5.1 | Dividend Payment . . . | 132 | 162 | 243 | 333 | 366 | 366 | 366 |
| 5.2 | Transfer to Reserves . . . . | 320 | 470 | 292 | 128 | 272 | 465 | 502 |

Part 'A' — List II

## MISSION & CORPORATE OBJECTIVES

***Mission***

Consistent with the country's socio-economic policies and programmes, the Company's Corporate Mission is to promote self-reliance in the Design, Development and Production of Professional Electronic Equipments the Components in India to international standards and to maintain the Company's leadership role in this field.

*Objectives*

1. To achieve and hold a position of pre-eminence in the design, development and production of professional electronic equipments and components.

2. To ensure that its products incorporate state-of-the art technology, economy in production, reliability and maintainability.

3. To act a catalyst for other public and private sector institutions and enterprises and promote their activities in the professional electronics field, consistent with its own mission and objectives.

4. To plan and achieve adequate growth in production and technology to meet the evolving market requirements through a judicious combination of in-house expansion, acquisitions and ancillarisation.

5. To contantly strive for optimum productivities and efficiencies in the utilisation of human and material resources and to promote pervasive quality consciousness in all its operations.

6. To provide a fair return on the investment and generate adequate internal resources, to finance the growth of the Company and renovation of its facilities.

7. To strive constantly for a fair deal to the customers of its products and services in regard to price, quality and after-sales support.

8. To achieve it R&D aims through the optimum use of its own resources in tandem with the resources available with other National Agencies and Research Institutions in the field.

9. To establish a long range plan and make it sufficiently well known to be able to utilise the vast resources in R&D available in the country.

10. To establish a significant overseas market for its products and services.

11. To assit the development of ancillaries and small scale units, both as suppliers and as customers, by providing technical as well as commercial support.

12. To provide for the systematic development of managerial, technical and professional skills among its employees so as to optimise the effectiveness of its workforce.

13. To ensure a happy and congenial work atmosphere which would generate job satisfaction and a sense of belonging and commitment on the part of its employees, to provide adequate opportunities for their career advancement, self-development and professional competence and to inculcate among its employees, respect for the human individual and goodwill towards all sections of the society.

14. To preserve and improve, where possible, the ecological balance in the geographical locus of the Company's operations.

## PART 'B'

## ACHIEVEMENTS

1. *Broadcasting of Production Activities*

(Ref: Part 2.1 &3.1.1 of Part 'A')

The period 1979-86 has seen BEL enlarging its production activities from an annual production turnover of Rs. 85.05 crores (1979-80) to Rs. 225.90 crores (1985-86) recording an increase of over 165 percent during this period. From a 2 Unit Company in 1979-80, BEL has broad-based its activities to a 4 Unit Company. Another 5 more units/ Establishments are under various stages of completion.

**The product-mix which reveals the broad production activities carried out unit/establishment-wise are as follows:—**

| *Unit/ Establistment* | *Description of Products* |
|---|---|
| ***Bangalore Complex*** | |
| *Equipment* | Professional wireless/electronic equipments, apparatus add systems *VIZ* Low power/High power equipments in the HF, VHF, UFH and Microwave ranges, Broadcast and Telecast Transmitters and Studio Equipments, Radars and Weapon Control Systems, Gun Control Equipments etc. |
| *Components* | . Electronic Components like Transmitting Valves, TV Picture Tubes, X-Ray Tubes, Germanium and Silicon Semiconductors, Integrated Circuits, Hybird Microcircuits, Ceramic Capacitors, Crystals, Vacuum Interruptors etc. |
| *Ghaziabad Unit* | . Professional Wireless/Electronic Equipments and Systems viz., High Power Static and Mobile Radars, Troposcatter and Line of Sight Equipments, IFF Data Handling Equipments, UHF and Microwave Multichannel Communication Equipment, VHF, Communication Equipment etc. |
| *Pune Unit* | . Image Intensifier Tubes, Image Convertor Tubes, Magnesium Manganese Dioxide Batteries, Laser Range Finders. |
| *Machilipatnam Unit* | . Optical and Opto-Electronic Equipment, Specialised Scientific eqipment for industrial and medical applications. |
| @ *Taloja Unit* | . Glass Bulbs for Black and White TV Picture Tubes. |
| @ *Panchkula Unit* | . Professional Wireless/Electronic Equipments for Defence Use. |
| @ *Kotdwara Unit* | . VHF/UHF Communication Equipment, PCM Multiplax Equipment. |
| * *TMD Hyderabad* | . Defence related systems in association with DLRL. |
| * *BEL TEX Madras* | . Tank Electronics and Vehicular System Equipment. |

@ New Units under implementation.

* Establishments.

With reference to specific areas of production mentioned in the Micro-objectives, the achievements are as follows:—

*Sonar Systems*—From the basic design by NPOL (National Physical Oceanic Laboratory) Cochin, BEL has productionised the APSOH SONAR systems for use in Frinates. So far 3 systems each valued at over Rs. 250 lakhs have been delivered to NAVY and one more will be delivered during 1986-87. Related systems like TOTED (Towed Target Decoy System) and HUMVAD (Hull-mounted variable Depath Sonar) have also been developed and productionised and have been programmed for production during the coming years.

*High Power MW/SW Broadcast Equipments*—So far 13 Nos. of 100 KW MW Transmitters have been delivered to AIR. For these Transmitters, the modulators were designed BEL while the High Power Amplifier stage designs were supplied by Messrs. Brown Boveri, Switzerland. Also 5 Nos. Modulators for 250/300 KW Transmitters have been manufactured and supplied. 1 KW, MW, 3 KW/5 KW FM Transmitters, 50 KW Short Wave Transmitters and 350 KW Short Wave Transmitters have been envisaged for production during the 7th plan period (1985 to 1990).

*Communication System for P&T*:—A number of communication equipments of indigenous design have been produced and supplied to P&T. They include 100 W HF SSB Transmitter/Receiver, HF Transreceiver LHP-219 & Communication Receiver HS—412. Plans for production of UHF and Microwave equipment and Digital Multiplex equipment are being progressed in coordination with the Department of Electronics, Department of Telecommunications and M/s. Indian Telephone Industries Limited.

*Satellite Terminals*—A major achievement of BEL has been the indigenous reception and rebroadcasting (with Low Power TV Transmitters also designed and produced by BEL) required by Doordarshan for their expansion programme. Quantity 112 Nos. of TVRO terminals for 5 Band and 69 Nos. of 100W Low Power Transmitters were made during 1983-84 against this project.

*Laser Systems for Communication and other applications*—While BEL has not embarked on Laser Systems for communication, BEL is engaged in the production and supply of Laser Range Finding Systems required for Armoured Vehicles of the Defence Services.

*Antenna Systems*—A variety of sophisticated Antennas developed and manufactured are given below:—

— S Band Surveillance Radar 4.7m×1.45 m double curvature parabola

— L Band Surveillance Radar 7.2m×4.3 m double curvature parabola

— S Band Transportable Surveillance Radar Antenna 5m×3m double curvature

L Band Transportable Surveillance Radar Antenna 5mX3m curvature parabola

— IFF Antenna 9m×3.5m to Integrated IFF Antenna

— Satellite Earth Station Antenna 6.2m Parabola with mesh

— Transportable Troposcatter Communication Antenna

— 2 CHz 3m Communication Antenna

— 900 MHz UHF Communication Antenna

— 600 MHz UHF Communication Antenna

— 400 MHz UHF Communication Antenna

— Long periodic arrays.

With reference to the Electronic Components area, progress achieved during 1979—1986 when related to the plans envisaged in the Micro Objectives are as follows:—

(a) *Cormanium and Silicon Semiconductors and Integrated Circuits*

(i) *Power Devices* consisting of power transistors, Silicon controlled rectifiers, diodes, medium power, high power and overlay R.F. and high voltage.

(ii) *Small Signal Devices* consisting of:

Silicon—Diodes, Low frequency, high frequency, switching, high voltage, JFETs.

Cermanium—Point contact diodes, Rectifier, Stabiliser, Phototransistor, Low frequency transistor.

(lii) Integrated Circuits, Linear ICs for Professional, Industrial, TV, Radio and Radio applications, Digital COS, MOS and MOSFETS.

(iv) Solar Cells—Space grade.

(b) *Hybrid Microcircuits*—consisting of voltage regulators and protection devices, audio frequency preamplifiers and poweramplifiers, resistor networks, RF Circuits, filters and special purpose circuits, audio filters, gate switches and relay drivers, resistive attenuators, ladder netwoks and arrays, SIP and DIP resistors and capacitor network, precision high voltage dividers, chip resistors and strip resistors.

(c) *X-Ray Tubes*—Stationary anode and rotating anode for medical applications.

(d) Passive Vacuum Devices including Vacuum capacitors fixed type, glass and coramic envelopes, vacuum contactor, vacuum relay.

(e) (i) *Cathode Ray Tubes*—For oscillescope. TV Radar, Computer and electromedical systems, for instruments data display and picture monitor.

(ii) *Liquid Crystal Display*—Specific types involving both Liquid Crystal and Plasma technology.

(f) $MgMnO_2$ Batteries, totally indigenous developed and productionised and supplied to our Defence Services (in various configurations).

(g) *Transmitting Tubes*—Ionisation gauge hand, rectifiers and Thyratrons (Xenon and mercury gas filled) low power tubes, medium power tubes, ceramic tubes, high power tubes, vapotrons.

(h) *Microwave Tubes*—Magnetrons used in pulsed oscillators in Navigational, search and FC Radar Systems.

(A licence agreement for manufacture of Klystrons and Microwave Tubes has been recently concluded and project has become operational in 1986-87).

(j) *Glass Bulbs for Piture Tubes*—A project for manufacture of Glass Bulbs for Black and White Picture Tubes has been launched and is under implementation. Production is expected to commence in November 1986.

2. *Growth in Turnover*

(Ref. Para 2.2 and 3.2.1 of Part 'A')

The product turnover growth profile of the Company as was

projected in 1979 and as actually achieved during the seven year period are indicated in the tabular statement below:—

| Year | Turnover in Rs. crores | | Growth rate percentage | |
|---|---|---|---|---|
| | Planned | Actuals | Planned | Actuals |
| 1979-80 | 100.00 | 85.05 | | |
| 1980-81* | 114·00 | 79·00 | 14% | .. |
| 1981-82* | 120·00 | 127.29 | 5.13% | 61% |
| 1982-83 | 135·40 | 144·50 | 12·8 % | 13·5% |
| 1983-84 | 151·70 | 163·86 | 12% | 13·4% |
| 1984-85 | 167.40 | 185.90 | 10·3 | 13·5 |
| 1985-86 . . . . | 178·30 | 225.90 | 6·5 % | 21.5% |

Note: The figures for 1980-81 and 1981-82 (shown in asterisks above) are to be considered as not normal as these related to a period of labour unrest, strike and lockout situation that existed during later 1980-81/early 1981-82 in the Bangalore Complex.

The growth rate achieved is greater than 10 to 12 per cent projected in the Corporate Plan from 1981-82 onwards.

With regard to mergers and acquisitions, BEL acquired 'The Andhra Scientific Company' Machilipatnam, in 1982 to effect and strengthen its development and production activities for supplies of Optical and Upto Electronic equipment needed for the Defence Sector.

3. *Technology leadership and strengthening the R&D Base*:

Ref: Paras 2.3 and 3.3 of Part A:

R&D efforts of BEL over the last three decades have resulted in the establishment of a strong in-house R&D base covering a wide spectrum of activities. As a result, there is almost complete self-reliance in the field of communication—from the lowest frequency to microwave and satellite communication. A number of new products have been developed—through total indigenous efforts—incorporating state-of-the art technology meeting the needs of Army, Air Force, Navy, All India Radio, Doordarshan, Police, P&T and Railways. BEL has built up comprehensive expertise in the design

of systems, equipments and antennas for Communication and Radar applications.

As regards innovative development in Components R&D, BEL has developed and produced Space Quality Cells and acquired total expertise in the development of Crystals and Crystal Filters for all professional needs of electronics.

As a result of BEL R&D activity, the production through wholly BEL developed products and substantial BEL R&D contribution stands at 80 per cent of total production.

The yearly investments for R&D activities and their percentage in terms of turnover for the period 1979—86 are given below:

(Rs. in lakhs)

| | 1979-80 | 80-81 | 81-82 | 82-83 | 83-84 | 84-85 | 85-86 |
|---|---|---|---|---|---|---|---|
| Capital Expenditure | 82 | 124 | 237 | 101 | 262 | 160 | 265 |
| Revenue Expenditure | 564 | 398 | 819 | 956 | 995 | 1380 | 1009 |
| Total : | 646 | 522 | 1056 | 1057 | 1255 | 1540 | 1274 |
| % of total expenditure to turnover | 7.8 | 7·5 | 8·1 | 7·4 | 8.1 | 8·2 | 5.8 |

It may be seen that the norm for R&D investment with reference to turnover of minimum 5 per cent has been maintained through out the period.

In terms of Technology acquisition in areas where due to specialised nature of requirements, indigenous R&D capability has not been built-up, the Company has concluded a few technology transfer agreements with foreign firms. Technology acquisition from foreign firms include the TRS-2215 Radar from M/s. CSF France, Cymbeline Mortar Locating Radar from M/s. Thorn EMI, UK, Colour Studio Equipment from M/s. Robert Bosch, West Germany, RF Power Tubes from M/s. Acrian, USA, High Power Klystrons and Travelling Wave Tubes from M/s. Varian, USA and a Fire Control Radar for the Army from M/s. HSA, Holland.

Indigenous designs acquired by the Company and engineered and taken up for production include MqMnO2 Batteries (Indian Institute of Science), the Automatic Electric Switch (Electronic & Radar Development Establishment), Secondary Surveillance Radar

(Defence Electronic Research Lab), E.W. Equipment (Defence Research and Development Lab), Sub-units for Space programme (Indian Space Research Organisation), Sonars (National Physical and Oceanography Lab) etc.

4. *Financial Objectives*:

Ref: Paras 2.4 and 3.4 of Part A:

Against a Capital investment of Rs. 100 crores planned for the period 79—86 to aim for the growth envisaged, the actuals of investment has been Rs. 139.46 crores. Against Government support envisaged to an extent of about Rs. 44 crores (44 percent of investment) the actuals has been Rs. 75.95 crores (54.5 percent of investment) for this period.

As envisaged in the objectives, the work on the following new Units have been initiated after obtaining Government approval and are under various stages of completion:

(1) Glass Bulbs factory at Taloja (Maharashtra)
Project Cost—Rs. 49.22 crores

Project completion targetted—31st March 87.

(2) Equipment factory at Panchkula (Haryana)
Project Cost—Rs. 24.84 crores

Project completion targetted—September 1989

(3) Equipment factory at Kotdwara (Uttar Pradesh)
Project Cost—Rs. 21.00 crores

Project completion targetted—September 1989

(4) Microwave Tube Project at Bangalore Complex
Project Cost—Rs. 17.16 crores

Project Completion targetted—1987-88

Two establishments one each at Madras and Hyderabad are also being set up for specialised operations (Establishment at Madras essentially related to Tank Electronics and the other at Hyderabad related to EW Systems).

The Company has consistently been able to operate of commercial considerations quoting fixed prices for its products which are also examined and negotiated where relevant by the Government. The Company's prices in general for major equipments are less than prices of similar equipments from foreign countries, especially in respect of equipment for supply to Defence Services.

The financial highlights of the Company are listed below :

(Rs. in Millions)

| Description | 1979-80 | 80-81 | 81-82 | 82-83 | 83-84 | 84-85 | 85-86 |
|---|---|---|---|---|---|---|---|
| Sales and Services | 829·5 | 689·1 | 1284·4 | 1422·8 | 1549·3 | 1865·3 | 2197·8 |
| Value of Production | 850·5 | 790·8 | 1272·9 | 1445·0 | 1629·7 | 1858·5 | 2259·0 |
| Other Income | 47·5 | 37·0 | 38·2 | 68·4 | 53·5 | 41·4 | 38·3 |
| Materials | 382.4 | 340.7 | 512·3 | 573·3 | 610·0 | 660·0 | 901·6 |
| Salaries, Wages and Benefits | 242·1 | 221.5 | 313.2 | 305.0 | 453·9 | 519·6 | 588·3 |
| Depreciation | 49·2 | 52·4 | 76·3 | 88·4 | 82·7 | 112·1 | 136·8 |
| Interest | 28·6 | 41·6 | 52.6 | 51.3 | 71.3 | 87.7 | 120·6 |
| Manufacturing and other expanses | 110·3 | 82·3 | 155·5 | 180·0 | 195·9 | 232.8 | 321·7 |
| Profit before Tax | 85·1 | 89·3 | 201·3 | 234·6 | 269·4 | 287·7 | 254·5 |
| Provision for Tax | 47·0 | 41·5 | 107·5 | 132·5 | 120.0 | 143·0 | 110·0 |
| Dividend | 12·5 | 14.1 | 15·8 | 16·9 | 18·4 | 26·3 | 38·9 |
| Equity Capital | 115·0 | 130.0 | 135·0 | 150.0 | 190.0 | 310·0 | 430·0 |
| Reserves and Surplus | 344·4 | 397·9 | 476·3 | 548·8 | 684·7 | 802·8 | 915·0 |
| Long Term Loans | 159·5 | 157.4 | 205.7 | 301·1 | 423·1 | 575.9 | 975·7 |
| Gross Block | 652·9 | 723·2 | 809·0 | 915·9 | 1057·8 | 1243·2 | 1466·0 |
| Cumulative Depreciation | 409·4 | 459·5 | 534·4 | 620·3 | 692.4 | 793·9 | 921 .8 |
| Inventory | 917.5 | 1161·9 | 1167·5 | 1263.8 | 1350.7 | 1424.2 | 1624.3 |
| Dubtors | 212·1 | 207.3 | 404·0 | 408·2 | 571·6 | 573·0 | 745·6 |
| Working Capital | 490·0 | 566·9 | 687·1 | 837·0 | 991·8 | 1013·7 | 1216·7 |
| Capital Employed | 733.5 | 830.6 | 962.6 | 1132.5 | 1357.2 | 1463.0 | 1761·0 |
| Net Worth | 459.4 | 527.4 | 610.8 | 694.6 | 843.4 | 1067.8 | 1295.7 |

As envisaged in Para 3.4.3 of Part A, the Company has been consistently paying a Dividend of 12% throughout the period.

5. *Personnel:*

Ref: Paras 2.5 and 3.5 of Part A.

The deployment of manpower in the various Units as envisaged in 1979-80 for the terminal year 1985-86 and actuals are shown below:

| | Unit | Planned | Actuals |
|---|---|---|---|
| 1. | Bangalore | 13031 plus marginal addition | 13725 |
| 2. | Ghaziabad | 3193 | 3054 |
| 3. | Pune Unit | 470 | 199 |
| 4. | Two new Equipment factories (viz., Panchkula and Kotdwara) | 5000 | 299 |
| 5. | Glass Bulb factory at Taloja | 400 | 117 |
| 6. | Others | 300 | 290 |
| 7. | Other Unit/Establishments at Machilipatnam, Hyderabad and Madras | NIL | 1219 |
| | TOTAL : | 23194 | 18903 |

Since the new Units at Panchkula and Kotdwara are in the initial stages of project implementation, only essential man power has been inducted.

6. *Ancillaries & Small Sector*

Ref. Paras 2.6 & 3.6

BEL continues to pursue the policy of developing ancillary units and small sectors. The turnover of ancillaries is as follows:—

(Rs. in lakhs)

| 1979-80 | 1980-81 | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 |
|---|---|---|---|---|---|---|
| 44 | 33 | 50 | 64 | 70 | 90 | 140·27 |

The ancillaries provide employment for about 350 persons.

BEL entered into a Hire Purchase Scheme with KSSIDC (Karnataka State Small Industries Development Corporation) for construction of an Industrial Estate Complex at Bangalore to replace

the old hutments occupied by ancillary units. This new Industrial Estate was inaugurated by Shri Sukh Ram, Hon'ble Rajya Raksha Mantri on 5th February 1986. This has helped the entrepreneurs for getting better facilities and space. New facilities like assembly and testing, FRP work, Semiconductor post moulding work, electroplating, precision machining, deep drawing have been added to the existing facilities.

Similarly the value of orders placed on the small-sector is indicated below:—

(Rs. in lakhs)

| 1979-80 | 1980-81 | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 |
|---|---|---|---|---|---|---|
| 173 | 154 | 225 | 268 | 478 | 489 | 812 |

The number of small scale units catering to our requirements is about 484.

7. *Exports*

Ref. Paras 3.7, 3.7.1 & 3.7.2

The Company had planned, as a policy, for export a target of 10 per cent of its turnover. The Company has not been able to meet this target.

The actual export of the Company achieved during the period 1979—86 is as follows:

(Rs. in akhs)

| 1979-80 | 1980-81 | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 |
|---|---|---|---|---|---|---|
| 505 | NIL | 1078 | 1305 | 575 | 40 | 18.4 |

In view of the large requirements of Indian Government users for electronic equipment and especially those for the Defence Services and the constraints of capacity available in BEL, exports so far has been possible only on a selective basis. Additional capacity is being created by way of new facilities which are under implementation. It is expected that the Company would be able to

reserve a limited portion of its capacity for exports when all these projects are fully commissioned. As a major part of BEL equipment supplies relate to our own Defence Services, firm considerations of priorities of our Defence requirements, increasing demands for Equipments and from considerations of strategic and related aspects, exports possibilities appear to be only on a limited scale and the Company may not be in a position to achieve its policy objective (on Exports) set out earlier.

With respect to Project Exports, the Company had submitted certain proposals for cutting up an Electronic Complex in the middle East and an African country. The Company has not been successful in these ventures so far.

## APPENDIX III

*Note on the Diversification Programme launched in BEL Ghaziabad Unit during 1975-76*

Ref.: Paragraphs 3.63 to 3.69 of the Ninth Report of COPU including the recommendations contained in para 3.67 (Page Nos. 60 and 61)

The sequence of events leading to the launching of diversification programme in the BEL Ghaziabad Unit is summarised below:

1. BEL Ghaziabad Unit was originally set up for the manufacture of a range of equipments entirely for Defence. Commercial production commenced in the Unit in September 1973. At the time of setting up of the Ghaziabad Unit, the Defence had indicated a large number of a particular equipment for which the major portion of facilities had ben set up in the Ghaziabad Unit.

2. In October 1974, the Company was informed by the Government that due to a drastic change in the Defence Plan, the Company should not commit at that stage for further manufacture of the particular type of Radar beyond what was in progress. This completely upset the very basis on which the Unit had been set up by BEL and hence, the Company submitted a compensation claim to the Government. Concurrently, the Company also examined ways and means of enlarging its production activities by attempting diversification.

3. At that point of time, the Bangalore Unit was engaged in the design, development and in a few cases, of initial production of a number of equipments in the VHF frequency band which were new versions of equipments manufactured and supplied by the Bangalore Unit for the Police Wireless Organisation. It was decided that these products should be transferred to the Ghaziabad Unit to provide for a diversification activity there. The list of equipments that were to be transferred to the Ghaziabad Unit from the Bangalore Unit was considered by the Board and the diversification programme with an estimated capital expenditure of Rs. 100 lakhs was approved in the meeting held in July 1975.

4. It was also noted at the Board meeting, that the expenditure on capital equipment will be incurred in phases and a small beginn-

ing would be made in 1975-76 itself with regard to introduction in production of the new equipment, "after the initial problems normally encountered in the introduction of the newly developed equipments in production were overcome". It was also brought out in the papers submitted to the Board that with the investment of Rs. 100 lakhs, it would be possible to improve the turnover to investment ratio in a period of 3 years (78-79) when the production could reach a level of Rs. 18.22 crores (including the items proposed for diversification) and the Unit would be enabled to make a reasonable profit in the year 78-79.

5. As mentioned in para 3.63 of the COPU Report, a total expenditure of Rs. 105.05 lakhs had been incurred by March 1982 with regard to the investment for diversification. Capital investment was made in a phased manner, with major expenditure taking place in the years 1978-79, 1979-80 and1980-81. Out of Rs. 105.85 lakhs, an amount of Rs. 12.25 lakhs related to Test Equipments that were transferred from the Bangalore Unit.

6. It can be noted from the Project Report for Diversification submitted to the Board and approved by them, that the following points had been brought out:

(a) Investment to be done in phases (year-wise investment proposals had not been shown specifically; these were contained in the yearly "capital budget" statements put up to the Board for the diversification programme),

(b) that there would be initial problems which are normally encountered in newly developed equipment introduced for production for the first time,

(c) the entire diversification programme was oriented towards ensuring a transition of the Unit from a "loss-making unit" to a "profit-making unit" to be achieved in a period of 3 years *i.e.*, by 1978-79,

(d) production of these equipments was planned commencing from 1977-78 itself although no specific time schedule for each equipment was shown in the Project proposals at the time Board sanction was sought. (However, the time schedule for introduction other equipments such as Cipher Equipment, Navigation Radar, Telemetry and Telecommunication Equipment for IOC, etc., were given in the Project Report),

(e) in the event of the transfer of VHF range of products in actual operation, the following difficulties were faced within the Ghaziabad Unit:

(i) the design transferred from the Bangalore Unit required modifications/improvements,

(ii) the learning curve in the Ghaziabad Unit of the work force pertaining to the new technology introduced in the Unit took time than anticipated,

(iii) technical problems also arose pertaining to specifications etc., requiring considerable interaction and resolution with customers—such as LUS 751 for the P&T Department etc. (elsewhere commented upon in the COPU Report) resulting in delays.

7. From the foregoing facts of the case, the Company considers that it would not be correct for the Committee to conclude that no time schedule was envisaged at the time of the diversification proposal and that there has been a case of lapse pertaining to this aspect.

8. In fact, the investment of Rs. 100 lakhs envisaged for the diversification programme was to provide balancing facilities for the production of the changed product-mix. The incremental investment was thus marginal compared with the investment already made which was of the order of Rs. 11 crores. As such, investment was not the principal factor in the implementation of the diversification programme but getting over the introduction problems and achieving profitability for which turnover was one of the primary aspects. The Board at their (114th) meeting on 30th July 1975 did consider in detail the turnover and have envisaged a time schedule for achieving the turnover and profitability as would be evident from the following extract from the relevant Agenda Paper.

"3.3 The following equipments under development by several

agencies are expected to be included in the production programme of BEL GAD in the years indicated against each:

| | Equipment | Development Agency | Probable first year of Prodn. | Probable Annual value of Prodn. |
|---|---|---|---|---|
| | | | | (Rs. in crores) |
| 1. | Ciphor Equipment ECL MK IV | DIRL., Hyderabad | 1977-78 | 2.0 |
| 2. | Navigation Radar for Patrol Boats | BEL, Ghaziabad | 1976-77 | 0·1 |
| 3. | Multiplex Equipment | BL, Bangalore | 1977-78 | 0·2 |
| 4. | 4/7 GHz Microwave Equipment | Do. | Do. | Dependent on P&T and Railways Schemes |
| 5. | Telemetry/Telecontrol Equipment for Indian Oil Corporation | BEL, Ghaziabad | 1976-77 | 0·2 |

7.4 The turnover per year baned on the proposals in para 3.2 and 3.3 in addition to the existing products can be expected to be around Rs. 1,822 lakhs by 1978-79, made up as below:

| | | |
|---|---|---|
| 1. | Sets VA & VC | Rs. 440 lakhs |
| 2. | VHF sets for Police—Mobile GH 301/351 | Rs. 170 lakhs |
| 3. | VHF sets for Police—Manpack LVP 313/315 | Rs. 104 lakhs |
| 4. | UHF Radio Relay LUS—751 | Rs. 88 lakhs |
| 5. | Cipher Equipment ECL Mk IV | Rs. 200 lakhs |
| 6. | 2 GHz Microwave Equipment | Rs. 100 lakhs |
| 7. | 4/7 GHz Microwave Equipment | Rs. 100 lakhs |
| 8. | Multiplax Equipment for 6 and 7 above | Rs. 40 lakhs |
| 9. | 3D Mobile Radar | Rs. 180 lakhs |
| 10. | Misc. Equipments (Radar for Patrol boats, Telemetry Equipment etc.) | Rs. 30 lakhs |
| 11. | 3D Static Radar | Rs. 370 lakhs |
| | | Rs. 1822 lakhs |

7.5 The anticipated turnover for 1978-79 indicated at 7.4 above shown that out of Rs. 1,822 lakhs only Rs. 550 lakhs comprising of the value of 3D Mobile and 3D Static Radar relate to ADGES equipment. The balance of Rs. 1,272 lakhs is the expected additional turnover of a marginal investment of Rs. 100 lakhs utilising the infrastructure already created in the form of capital facilities. Additional manpower will have to be inducted depending upon buildup of production. Thus the marginal investment would assist to improve the turnover to investment ratio from 1 : 0.45 to 1 : 1.35.

7.6 The facilities created in the form of buildings, services and other facilities is sufficiently large in Ghaziabad and with further marginal investment depending upon new products it should be possible to improve the ratio further. In Bangalore, the gross value of Fixed Assets as on 31-3-1975 is Rs. 33.60 crores for a production of about Rs. 60 crores to 70 crores. If the investment is adjusted to current prices the investment would certainly be in the neighbourhood of Rs. 45 to 50 crores and the ratio would be of the order of 1 : 1.5. It should be possible for BEL GAD to achieve this investment-turnover ratio with marginal investments if the demand for equipments as above were to increase.

8.1 The working results of Ghaziabad Unit for the year ended 31-3-75 has resulted in a net loss of Rs. 1.72 crores with a turnover of 1.35 crores. Even if we assume the recovery of manufacturing and non-manufacturing over heads at the rate of 25 per cent on the turnover, the unit is expected to break even at a turnover of Rs. 9 crores. The anticipated turnover for the year 1978-79 as per 7.4 above is Rs. 18.2 crores and it would certainly be able to make a reasonable profit on this turnover in year 1978-79."

9. The, diversification programme not only enabled the Ghaziabad Unit to increase its turnover but also helped in acquisition of newer technology and newer product lines in the Unit.

## APPENDIX IV

*Note submitted by BEL pertaining to the Development, Manufacture and Supply of the LUS-751 UHF Multi-Channel Equipment to the P&T Department.*

(1) *Background to the Development*

A proposal for development of a UHF Radio Relay Equipment for civilian customers was initiated in BEL in the later half of 1971 and actual development work was started in November, 1971 after receipt of materials and components. Telecommunication Research Centre (TRC) of the P & T evinced interest in this development as they had also been working on similar development project. After a series of discussions, a memorandum was issued by P & T in accordance with which the equipment was developed jointly by TRC and BEL R&D. One working model was developed in a year's time and was sent to TRC in New Delhi for their examination in November 1972. They carried out some preliminary tests and, based on their comments, two 'A' models were made in February 1973. These two 'A' models were subjected to a thorough electrical testing in BEL for a period of one month by TRC representatives. After this testing, the basic design was cleared by TRC and BEL were asked to make the trial models incorporating certain circuit improvements. The equipment was so engineered and the recommended improvements were incorporated and suitable aerial systems were also developed. Four models were tested by TRC at BEL and despatched in August, 1973 for field trials after installation. TRC tried out the equipment and the trials included actual traffic. The Trial Report was sent to BEL in May, 1974. To quote from the Trial Report, 'tests do indicate that with some modifications good system performance is capable of realisation. For the present, specific component and wiring failures were not taken note of, since the equipment was only a development prototype. The reliability aspects can be taken care of during tests on the equipment from regular production.' Based on the results of the field trials, P & T placed an indent in May 1974 which indicated that BEL should produce UHF equipment to meet the technical specifications to be finalised by P & T after further evaluation of the equipments. Consequently, a batch of 14 Nos. was taken up as pre-series production. The TRC in June 1975 told BEL that the first few days from production would be

put through field trials in one or two designated routes. Four boys were offered to P & T during January 1976 for evaluation and acceptance.

(2) *Transfer of production to Ghaziabad Unit*

The Company was faced with a problem during 1974-75 pertaining to lack of certain promised orders under the ADGES Plan on the Ghaziabad Unit and consequent capacity utilisation problems. A decision had hence to be taken by the Company to diversify the production at the Ghaziabad Unit (A reference may also be made in this connection to Recommendation at Sl. No. 11 and reply there to). Accordingly, certain product lines which were initially intrduced for production in the Bangalore Unit were transferred to the Ghaziabad Unit. In deciding on this transfer, the views of customers were also taken into account. From the point of view of capacity balancing and utilisation, among the Company's Units as a whole, the Company had no other option but to go ahead with the transfer of production to the Ghaziabad Unit.

(3) *Technical Specifications*

Certain broad specifications for the equipment had initially been jointly worked out by the Telecommunication Research Centre of the P & T and BEL. Since the indigenous development of the equipment was a pioneering effort taken up by BEL and P & T together and the design objective was the utilisation of indigenous available components to the maximum possible extent, the changes in specifications from time to time, modifications/improvements in design concepts etc. had to be taken note of as an ongoing exercise. Certain slippages in time in design finalisation arose as a consequence. The equipment was ultimately manufactured to a mutually agreed technical specification, inspected and accepted by the customer to this agreed specifications.

(4) *Delay in supply of equipment and short closure of order limited to 58 bays.*

Due to the changes that took place in the design, there was a delay in the production and supply of the equipment. The specifications requirements pertaining to the noise performance of the equipment was also made more stringent by the P & T (from 1000 picowatt to 100 picowatt) possibly on account of the need to fit the UHF terminals in the national network. Since improvements

LIST OF

to bring the noise performance to this level in the exist-
ign was not considered possible any further, and a totally
Sl. No. esign would involve further considerable time, it was decided
lly to restrict the supply to P & T to a quantity of 58 bays.

ANDI

1. *Increase of Price*

At the time the joint development work between TRC and BEL was initiated reasonably accurate estimates could not be made by BEL since the equipment was the first of its kind to be developed. During the course of development, it was noticed that the original estimates based on which a price of Rs. 97,000/- per bay had been quoted was an under-estimate and hence a revision to a figure of Rs. 2.55 lakhs per bay was sought by BEL.

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## APPENDIX V

(*Vide* Para 3 of the Introduction)

*Analysis of the Action Taken by Government on the recommendations contained in the 9th Report of the Committee on Public Undertakings (Eighth Lok Sabha) on Bharat Electronics Limited—Objectives and Implementation of Projects.*

| | | |
|---|---|---|
| I. | Total number of recommendations | 32 |
| II. | Recommendations that have been accepted by the Government (*Vide* recommendations at Sl. Nos. 1-4, 6-10, 17-20, 25, 30 & 31) | 16 |
| | Percentage to total | 50% |
| III. | Recommendations which the Committee do not desire to pursue in view of Government's replies (*Vide* recommendations at Sl. Nos. 5, 11, 21-24, 29 and 32) | 8 |
| | Percentage to total | 25% |
| IV. | Recommendations in respect of which replies of Government have not been accepted by the Committee (*Vide* recommendations at Sl. Nos. 12, 13, 14-16 and 26-28) | 8 |
| | Percentage to total | 25% |
| V. | Recommendations in respect of which final replies of Government are still awaited. | Nil |

PUBLISHED UNDER RULE 382 OF THE RULES OF PROCEDURE AND CONDUCT OF BUSINESS IN LOK SABHA (SIXTH EDITION) AND PRINTED BY MANAGER GOVERNMENT OF INDIA PRESS, MINTO ROAD, NEW DELHI.