NINTH REPORT

COMMITTEE ON PUBLIC UNDERTAKINGS (1985-86)

(EIGHTH LOK SABHA)

BHARAT ELECTRONICS LTD.— OBJECTIVES AND IMPLEMENTATION OF PROJECTS

(Ministry of Defence - Department of Defence Production & Supplies)

Presented to Lok Sabha and Laid in Rajya Sabha on 29.4.1986

LOK SABHA SECRETARIAT
NEW DELHI

April, 1986/Vaisakha, 1908 (Saka)

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COMMITTEE ON PUBLIC UNDERTAKINGS

(1985-86)

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STUDY GROUPIII ON BHARAT ELECTRONICS LTD., NATIONAL HYDRO-ELECTRIC POWER CORPORATION LTD., BHARAT HEAVY PLATES & VESSELS LTD., HINDUSTAN FERTILIZER CORPORATION LTD., MANAGEMENT OF INVENTORIES IN PUBLIC UNDERTAKINGS.

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3. Shri Satyagopal Misra
4. Shri Haroobhai Mehta
5. Shrimati Geeta Mukherjee
6. Shri G. S. Mishra

INTRODUCTION

I, the Chairman, Committee on Public Undertakings having been authorised by the Committee to present the Report on their behalf, present this Ninth Report on Bharat Electronics Ltd.

2. The Committee's examination of the working of the company was mainly based on the Report of the Comptroller and Auditor General of India, 1982, Union Government (Commercial) Part-XI.

3. The Committee took evidence of the representatives of the Bharat Electronics Ltd. on 10 and 11 September, 1 October, 4, 5 and 6 November, 1985 and also of the representatives of the Ministry of Defence (Department of Defence Production & Supplies) on 27 January, 4 and 5 March, 1986.

4. The Committee considered and adopted the Report at their sitting held on 21 April, 1986.

5. The Committee wish to express their thanks to the Ministry of Defence (Department of Defence Production & Supplies) and Bharat Electronics Ltd. for placing before them the material and information they wanted in connection with examination of the Company. They also wish to thank in particular the representatives of the Department of Defence Production & Supplies, Department of Electronics, Department of P&T and the Undertaking who appeared for evidence and assisted the Committee by placing their considered views before the Committee.

6. The Committee also place on record their appreciation of the assistance rendered by the Comptroller & Auditor General of India.

NEW DELHI;
April 28, 1986
Vaisakha 8, 1908 (S)

K. RAMAMURTHY,
Chairman,
Committee on Public Undertakings.

CHAPTER I

HISTORICAL BACKGROUND

The Bharat Electronics Ltd. (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 the Company was to meet the requirements of Defence Services and Civil Government Department *viz.* Doordarshan, All India Radio P&T, Railways and para-Military Forces for professional electronics equipments through indigenous production. The Company was also charged with the production of specialised components for the entertainment of electronics industry in the country.

1.2 BEL is at present manufacturing *inter-alia* various types of Transmitters, Trans-receivers, Radars, Opto-electronic equipments and a wide range of components *i.e.*, Magnetrons, Semi-conductors Devices, Condensors, Coils, Chokes, Transformers, etc.

1.3 The Company when incorporated had one unit in Bangalore. It has at present four operational units situated at Bangalore, Ghaziabad, Pune and Machilipatnam. Three more Units are under various stages of implementation at Panchkula (Haryana), Taloja (Maharashtra) and Kotdwara (Garhwal-UP). In addition, two establishments at Hyderabad (Andhra Pradesh) and Madras (Tamil Nadu) have also started manufacturing specialised Defence items.

1.4 The Company's Authorised capital, which was initially Rs. 1000 lakhs, was raised to Rs. 3,500 lakhs as on 31st March, 1984. The Paid-up capital as on 31st March, 1984 was Rs. 1900 lakhs contributed entirely by the Government of India.

CHAPTER II

OBJECTIVES AND OBLIGATIONS

(A) *Objectives*

The Memorandum of Association of the Company lays down that the main objects of the Company are to design, develop and manufacture:—

(a) Electronic equipment such as Transmitters, Trans-receivers, Oscillators, Amplifiers and Radar equipments, X-ray machines, Surgical and Medical appliances, Testing instruments, etc.

(b) Specialised electronic components such as Electron Tubes, Magnetrons, Klystrons, Semi-conductors, Resistors, Condensers, Coils, Chokes, Transformers, Switches, etc.

2.2 The Administrative Reforms Commission (ARC) in their Report on Public Sector Undertakings (October, 1967) had recommended that the Government should make a comprehensive statement on the objectives and obligations of Public Undertakings. The Bureau of Public Enterprises (BPE), while communicating the acceptance of the above mentioned recommendation of the ARC, requested (November, 1970) the Ministries concerned to initiate action to have the objectives and obligations of the individual Public Enterprises laid down in consultation with the Ministry of Finance. No action in pursuance of the above directives was taken by the Company till November, 1979.

2.3 In May, 1979, the BPE issued instructions to the Ministries to advise the Public Enterprises under their control to spell out their micro objectives consistent with the broad objectives spelt out in the Industrial Policy Statement of December 1977, to facilitate the realistic and meaningful evaluation by the Committee on Public Undertakings and the Government. In pursuance of these instructions the Company forwarded to the BPE in November, 1979 with a copy to the Ministry of Defence (Department of Defence Production) a note detailing the Corporate (Policy) objectives and micro-objectives framed in pursuance thereof alongwith a Corporate Plan for the coming 7 to 8 years (without the approval of the Board).

The Corporate objectives/plans sent to the Ministry in November, 1979 are stated to have been put up to the Board of Directors of the Company only in April, 1982 for ratification. The Board while ratifying the action of the Company noted that a revised Corporate Plan would be submitted by the Company taking into account the Government's decision on the three new projects and the Defence needs as recently finalised. The Board finally approved in May, 1983 the Corporate (Policy) objectives and Corporate Plan that had been proposed in November, 1979 covering the period from 1979 to 1986.

2.4 As the objectives framed by the Company were only of short-term nature, the Department of Defence Production communicated their observations thereon to the Company in December, 1979 which included *inter alia* the following:—

(a) The Corporate Plan prepared was largely based on the Five Year Corporate Plan it had prepared on the basis of the requirements of the Services for various types of electronic equipments during the Defence Plan period 1979—84 and suffered from the following defects:—

(i) The Plan did not base itself on a long-range policy of equipments required by the Services. It sought to expand capacity during 1979-84 *i.e.*, during the Plan period itself. This was not logically possible, as apart from procedural aspects of sanctions, etc. the Company would require time for planning the capacity. By the time it was ready to supply the equipments required in the Defence Plan 1979—84 three years of this plan period would have been spent in capacity planning. The requirements of the entire plan period would, therefore, be supplied only towards the end, leaving the requirements of the first three years either to be postponed or met by imports.

(ii) The product-mix of the Company over a long period would shift in accordance with the product-mix required by the Services, which itself would be based on a long-range conception by the Services of the equipments required by them. In the field of Electronics, most of the equipments were related to weapon system and unless the long-range requirements of specific weapon systems were determined it would not be possible to identify the associated electronics required for the same.

(iii) The Plan based itself on the existing R&D facilities and did not have a proper strategy for linking production of new equipment with a phased policy of developing the

existing R&D capacity to meet the emergent requirements.

(iv) The Corporate Plan apparently had been prepared in isolation from the totality of the Electronic Plans and projections of the rest of the country. Even though the Company was engaged in meeting the requirements of major Civil users like Police, AIR, P&T and Civil Aviation, the Plan did not take care of their increasing requirements. The Plan also did not visualise any strategy for using the capacities built in the electronic field in the Indian Industry for supplying items to the Company on contractual basis.

(b) In the last 25 years, the Company had grown substantially but mainly as a result of *ad hoc* responses to the needs of Defence, principal civilian users and keeping abreast with development of technology. This had resulted in a wide variety of product-mix and equipments and components. The product-mix needs to be rationalised which would help in defining the long-term project goals with consequent implications for the Company and the Electronics sector of industry and assuming with some degree of precision the size and volume of transactions, the corporate structure and the organisation required to meet the same over a period of say, 10 to 15 years.

In order to carry out this exercise, the following steps were suggested by the Ministry:

(i) Identification of Defence requirements over a long-range period;

(ii) Identification of projects which could appropriately be executed by the Company. For the equipments which could not/should not be handled by the Company, creation of additional capacities, either in the public or private sector, would have to be considered after taking into consideration the capacity built over the years in the Indian Industry; and

(iii) Identification of equipment required by principal civilian users, *viz.*, Railways, Civil Aviation, AIR and Doordarshan, P&T, Police, Petro-Chemicals, etc. Here again the areas left by the Company have to be catered through

the existing or additional capacities to be created in the rest of the Industry.

(c) Ever since the inception of the Company in 1954, it had been taking a lead in introducing high technology items both for Defence and Civil uses. While identifying new as well as parallel technologies and also identifying the product-mix for the Company, it would be essential to find out the areas where the Company had a future in providing technology lead; areas of less complicated technology where competence had been developed elsewhere, have to be left out of the Company's long-range plans.

(d) Commensurate with the requirements of achieving self-reliance in the technology required for Defence, principal Civilian Users and to maintain the technology lead by the Company, an R&D plan would have to be evolved. After identifying the long-range guages of the R&D plan, a strategy would have to be evolved to implement the plan with adequate resources, both financial as well as man-power.

(e) Over the years, the Company had succeeded in developing technologies in various fields. However, as of today, the policy had been by and large, with a few exceptions like T.V. technology for the small sector, to use the technology for production within the Company's establishments. For a company of BEL's size and importance' it was essential, over a long-range period, to have a policy of providing technology to other units in the industry which were not capable of investing funds in R&D and generating their own technology. This process could be enlarged by having a clearly defined role of R&D projects where the technology developed need not necessarily be used for production within the Company, but could be sold through licensing arrangements to other Units.

(f) The Company should have in their Corporate Plan a long-range strategy for developing bith export as well as transfer of technologies to third world countries by taking advantage of Government's policy of entering into joint collaborative ventures with firms of developed nations for providing technology transfer to third world countries.

(g) According to the Company's experience, fulfilling the role of providing technology lead and meeting essential requirements of military and civil users for sophisticated equipments, did not provide an adequate profit base to generate internal resources. It would, therefore, be necessary for the Company to evolve a plan for undertaking projects where profit earning capacities were higher than in projects which otherwise legitimately come within its field.

(h) The Company would be well advised to set up immediately a high-powered perspective planning cell directly answerable to the Chief Executive for working out a more scientific perspective plan.

2.5 The above remarks of the Ministry on the Corporate objectives/plans received in December, 1979 were not reported to the Board. The Govt. sanction for setting up of their new projects was received in September/October, 1982. A revised statement of Corporate Objectives Plan covering the period from 1985—1990 was prepared by the Company in the light of Ministry's observations and were got approved by the Board and submitted to Govt. in May, 1985.

2.6 According to Audit, no report indicating the actual performance in fulfilment of the objectives formulated for the period from 1976—86 had been submitted either to the Board or to Government till April, 1983.

B. *Corporate Plan*

2.7 The actual achievements for the 5 years from 1979-80 to 1983-84 for some of the financial projections made in the Corporate Plan are summarised below:—

(Rs. in lakhs)

	1979-80		1980-81		1981-82	
	Planned	Actual	Planned	Actual	Planned	Actual
Sales . . .	10,007	8,295	11,400	6,891	12,000	12,844
Profit before tax .	734	851	1,129	893	917	2,013
Dividend Payment. .	132	125	162	142	243	158
Capital Exp. . .	1,000	634	1,693	861	3,015	832
Equity . .	1,190	1,150	1,320	1,300	2,540	1,350
Loans Outstanding. .	1,539	1,586	1857	1569	2,035	1,623

	1982-83		1983-84	
	Planned	Actual	Planned	Actual
Sales	13,540	14228	15170	15493
Profit before tax	852	2,346	1370	2,696
Dividend payment	333	169	366	184
Capital Expenditure	1763	1021	1035	1828
Equity	3030	1500	3050	1900
Loans outstanding	3184	2063	3134	2512

2.8 According to the Audit the Board had not been kept informed of the performance with reference to various targets set in the Corporate Plan and reasons for variations.

2.9 When it was pointed out by Audit that the Corporate objectives were only the short-term objectives for the period 1979—86 and did not cover the objectives and obligations envisaged in the BPE circular of November 1970 the Ministry stated (April 1983):

> "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."

2.10 On enquiry as to why the Board had not been kept informed of the various targets set in the Corporate Plan, their achievements and reasons for variation etc. the Company have informed the Committee that "since the assumptions on which the Corporate Plan was prepared were beset with uncertainties, the Plan could be considered only as a broad indication and not as a bench mark for close monitoring by the Board. Uncertainties relating to major weapon systems still remained even after Government sanctions were received. Hence it was not considered useful to prepare a revised Corporate Plan. However, the performance with reference to the annual target is always constantly reviewed by the Board in terms of quarterly, half-yearly and annual performance. Since 1982, the Company's quarterly performance is also reviewed by the Government in Performance Review Meetings (PRM)."

2.11 When asked about the reasons for taking more than 3 years by the Company in furnishing the revised Corporate Plan, the Company in a written note furnished to the Committee has stated:

> "The Corporate Plan was submitted in November, 1979. At that time it was anticipated that it would be possible to get Government approval within a short time for the three 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 licence agreement with M/s. Cornings had also been concluded and submitted to the Government 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, it was 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."

2.12 Accordingly the Corporate objectives were placed before the Board for consideration in the 161st Meeting held in May, 1983 and were got approved. A revised Corporate Plan for a five year period from 1985 to 1990 was also approved by the Board and submitted to the Government in May, 1985.

2.13 In the written note furnished by the Deptt. of Defence Production it has been stated that the Company submitted its perspective plan for 1985—90 (Coinciding with the Seventh Plan period) in May, 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.

2.14 During oral evidence of the Ministry of Defence (Department of Defence Production), the Committee enquired as to why the Ministry took more than three years in according approval to the

Corporate Plan submitted by the Company, The Secretary, Defence Production replied:—

> "To the best of my knowledge there is no order of the Government which requires Corporate Plan of the public sector undertaking to be formally approved by the Government. The Company had prepared a Corporate Plan, sent it to Government. Government has conveyed its observations and suggestions. The Company revised the plan in 1982 because they had included some projects in the corporate plan for which sanction had not come by that time. Therefore, the Company took time to finalise its corporate plan."

The witness added:

> "The formal approval of the Government to the Corporate Plan is not necessary. The Corporate Plan may contain some investment proposals. The investment proposals require Government decision if it is not within the delegated powers of the Public Sector Undertaking."

2.15 The Committee pointed out that when the Company submitted a Corporate Plan in 1979, it had included therein a proposal for setting up of three new factories which had been cleared by the Expenditure Finance Committee. At that time, the Company had anticipated to get Government's approval thereto within a short time. Accordingly, the Company concluded an agreement in this regard in 1979 with M/s. Cornings of USA and submitted the same to Government for approval. As the Government's approval for the projects was received in September and October, 1982 respectively, the Company could not prepare a revised plan. The Plan had to be held over till the sanction was given by the Government. It has also been admitted by BEL that "Funds are not the only constraint but it is the sanction of the Government, which is the constraint. If the Government sanction is not there then we are not permitted to invest. That is how the Government companies are helpless to meet shortfall which has been occasioned by the delay in sanctioning of projects."

2.16 When asked as to what the Ministry had to say in the matter, the Secretary, Defence Production stated:—

> "Depending on the capital structure of each public sector undertaking they are allowed to invest, BEL at present

are allowed to take investment decisions on projects costing upto Rs. 4 crores. Within these powers Government sanction cannot be a constraint. Where the Public Sector Undertaking is not authorised to take any investment decision on projects costing more than Rs. 4 crores, it is a constraint. In certain cases Government sanction has to be taken. If it is less than Rs. 10 crores, approval of the Minister has to be taken; but it does not go to the Cabinet Committee. After it has been sorted out and agreed to, sanctions are issued. It was put up to CCPA and sanctions were issued."

2.17 The Committee pointed out that the Corporate Plan submitted by BEL contained details of three projects which required specific approval of the Government and for the proposals received by the Ministry in July, 1978. Final approval was given only after four years i.e. in September/October 1982. When the Committee enquired as to why the matter was got so much delayed, Secretary Defence Production then stated:—

"I have brought the following chronological events since the date of the proposal and the date on which sanction was issued. The proposals for two projects, namely, Panchkula and Kotdwara (Garhwal—U.P.) were received from BEL: vide CMD letter dated 23rd July, 1978:

23-7-78	Project report for setting up two factories and requesting for presentation, and not for sanction.
28-8-78	Presentation by BEL - case considered reasonable and recommended for processing Government approval.
21-10-78	Draft EFC Memo received from BEL; forwarded to IF (DP).
4-9-82	Government letter for setting up two factoreis issued.

These proposals have been sent from one Department to another. It went from Integrated Finance (DP) to Secretary, Planning Commission and then to Secretary, Department of Electronics for comments. It was also sent to Sodhi Committee. On 19th July, 1982 draft CCPA paper was approved by the Defence Ministry. On 24th July, 1982, draft CCPA paper was approved by the Finance Minister."

2.18 Explaining the procedure for sanctioning of new projects, the Deptt. of Defence Production in their written note furnished to the Committee have stated:—

"There are two kinds of procedure followed in the Ministry for sanction of Defence and non-Defence projects. A defence project received in the Ministry is examined in consultation with the Integrated Finance and the user. If the project cost is less than Rs. 10 crores, the approval of Secretary (Expenditure) is obtained on file before issue of project sanction. If the capital expenditure is more than Rs. 10 crores, approval of CCEA is obtained.

In respect of civil projects, for projects costing less than Rs. 10 crores an Expenditure Finance Committee Memo is prepared for the project and circulated to all vetting agencies viz. Planning Commission. BPE, Plan Finance, Department of Economic Affairs etc. The comments of the project vetting agencies are then incorporated in the EFC Memo and put up to the EFC for approval. Project sanction is thereafter issued by the Administrative Ministry after taking the approval of the Minister. For projects costing more than Rs. 10 crores, the proposals are considered and approved by PIB and CCEA.

In the case of these equipment projects also the above procedure had to be followed, which took time for thorough examination by various agencies and final sanctioning of the projects."

2.19 When asked whether any procedure has now been evolved to eliminate the chances of such delays, the Secretary, Department of Defence Production stated:—

"Earlier the system was that right from the conception stage, market assessment demand, location of site, arrangement of finance, cash flow, working capital, source of know-how, plant and machinery and technically speaking detailed project report should be available before Government could give clearance signal. Now, from 29.3.1985 the system is that supposing a company wants to go in for anything then a decision in principle is taken so that they can start preparing feasibility report. After the detailed project report is prepared then the investment decision

is taken by the Government|Cabinet. So, it reduces the time-taken in deciding the matter."

2.20 The Committee were also informed by the witness that the proper course for BEL would have been to split up the plan into two parts i.e. one part could deal with new projects requiring sanction of the Government and the other part could contain projects with which they could go ahead straightway. On enquiry whether at any stage the Ministry advised BEL to proceed with the matter accordingly, the witness stated "not to my knowledge."

2.21 The Committee pointed out that when a particular public sector Company especially the one like BEL involved with a national security was working under a wrong impression it was the duty of the administrative Ministry or the concerned officer in the Ministry dealing with the Corporate Plan etc. to educate the Company to act in a particular way i.e. to split the plan into two parts. But in the case of BEL, even in the inter-Ministerial discussions on the Corporate Plan no such advice of spliting the plan was given to the BEL at any stage.

Pointing out that the inordinate delay in sanctioning the Corporate Plan had resulted in loss to the Company due to non-production of equipment, escalation of cost etc. the Committee enquired whether the Ministry could consider in terms of fixing responsibility for the delay negligence, the Secretary, Defence Production stated:

"The question would not arise since it did not require any formal approval of the Government...If I were in that place I would have resorted to this advice. If I were the Chief Executive of BEL I would have done it, but it does not mean that they should expect the Government advice on this or the Government was expected to tell them....

I can submit only two things. If somebody has neglected in taking expeditious action as per the procedure prescribed, then certainly action should be taken against him. But after going through the chronological events I must submit that I don't think any person was responsible or any undue delay had taken place. It is because, it went to one committee which was not a standing committee to which the proposal was required to be sent. Sodhi Committee came into the picture. The proposal went from the Department of Defence Production to Expendi-

ture and then to Planning Commission and to the Department of Electronics. Location problem came in..... But this is a fact of life that this proposal has taken two years. This is also a fact of life that nobody has sat on the file."

2.22 When asked whether the Bureau of Public Enterprises has prescribed any role for the Government nominees on the Board of Directors of Public Undertakings, the witness replied:

"I think there was some communication some years ago. I do not know exactly but this matter came up, in fact, in one of the annual conferences of the Chiefs of the public enterprises in the year 1983 and some recommendations were made by the Conference, with which the Government did not entirely agree. The situation on this point now seems to be fluid. But without waiting for any consensus or for any guidelines, this much is very clear that 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 hanky-panky."

2.23 When asked whether the revised plan submitted by BEL, has since been approved or is still pending with the Government, the witness stated:—

"When the new Corporate Plan was received some time in May, 1985 we prepared a brief on it, sent it to the three service Chiefs and to the Minister concerned and organised a formal presentation by the BEL. They made a formal presentation in which in addition to Defence Minister, Senior Officers from the Ministry, the three Service Chiefs alongwith the senior officers were present. Some suggestions and some comments came. Based on that, we wrote a formal letter to BEL. However, these suggestions are made to keep this in view while finalising the plan and whenever any Government approval is required for any investment decision as per the prescribed procedure, it is expected that the Company would approach the Government for sanction. The formal letter was issued to all. No plan is pending with the Government.

2.24 When asked whether the Corporate plan should be taken to have been cleared, the witness stated:

> "I cannot give two comments to the Committee. To the best of my knowledge, I have not come across any order of the Government requiring formal approval of a corporate plan but certainly we examined it from all the information available and we sent them our comments in writing."

When further asked whether the Corporate Plan was now ready and available with BEL to operate upon and implement without any further reference to Government, the witness stated "the investment proposal has to come to the Government, wherever necessary."

2.25 The Committee note that in pursuance of the recommendation of the Administrative Refoams 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.

2.26 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.

2.27 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),

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.

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.

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 then keeping the whole issue pending for over three years.

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. 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 Undertakings 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 delay 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.

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.

CHAPTER III

SANCTIONING AND IMPLEMENTATION OF PROJECT

A. *General*

According to Audit, one of the Policy objectives set before itself by the Company is to 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. The Company has so far established three production units at Bangalore, Ghaziabad and Pune. The Bangalore Unit went into production in 1956, the Ghaziabad Unit in 1973 and the Pune Unit in 1980. The Government had sanctioned in September, 1982, the setting up of two more Units for the production of Defence related electronic equipment to be located at Panchkula in Haryana and in the Garhwal district of Uttar Pradesh. In addition Government also sanctioned in October, 1982 the establishment of a plant for the manufacture of Glass Shells for T.V. Picture tubes to be located at Taloja near Greater Bombay.

3.3 According to BEL, new Units are expected to be commissioned as under:—

	Initial Production	Full Commissioning
Panchkula Unit (Equipment)	1985-86	September, 1989
Kotdwara Unit (Equipment)	1986-87	September, 1989
Taloja Unit (Glass Shell)	——	November, 1986

3.3 The Board of Directors of the Company is also reported to have approved establishment of Tank Electronics support Centre at Madras (April, 1984) and Electro-Magnetic division at Hyderabad (February, 1984). They are under execution.

3.4 The total capital expenditure incurred by the Company upto 31st March, 1984 was Rs. 11,136 lakhs.

3.5 Upto July, 1978, the proposals for taking up new/expansion projects submitted to the Board/Government gave only broad outlines regarding the products proposed to be taken up, estimated capital cost, justification based on rough demand forecast and did not

comply with several important guidelines relating to demand study, technical feature, phasing of construction profitability cash flow analysis, cost benefit analysis, etc. as laid down in the BPE guidelines of April, 1968 and December, 1969.

3.6 According to Audit, there was a system of submitting to the Board half-yearly progress reports on major schemes under implementation which was discontinued in December, 1972. In December, 1979, an appraisal on the investment made in four components, *viz.* Receiving Valves, Germanium Semi-conductors, Silicon Devices and Integrated Circuits was submitted to the Board with a promise to put up similar reviews in respect of other components; this had not been done till April, 1983.

3.7 In regard to equipment schemes taken up, no appraisal on investment had been conducted till April, 1983. Only in April, 1982 the Company introduced a system of regular monitoring of the progress in the implementation of projects and collecting the expenditure incurred thereon. As a result, the Company did not have ready and up to date details of the actual expenditure incurred on each of the projects implemented earlier *vis-a-vis* the cost over-run.

3.8 In this regard, the Ministry had informed the Audit in March, 1983:—

"As stated by the Audit, all project proposals made in the last 4 years contained the requisite details mentioned in BPE guidelines. As regard the submission to the Board of progress reports on major projects, no major projects had been sanctioned for BEL after setting up of the Ghaziabad Unit. Now that 3 major projects have been sanctioned (Glass Bulbs Project and two Equipment factories), periodical progress reports giving component-wise expenditure will be submitted to the Board as well as reported to the Government keeping in view the requirements of the integrated reporting system suggested by the BPE.

Regarding the submission to the Board of Appraisal Reports on other Components and Equipments Divisions, action is on hand and they are expected to be submitted shortly.

As regards reporting to the management of the actual expenditure against individual schemes, a monthly Division-wise Capital expenditure Statement and a monthly individual project wise report have been introduced and implemented from 1982-83. As the capital expenditure is recorded in

the documents maintained by the Fixed Assets and Works Sections, the expenditure incurred is collected from such documents to prepare these reports."

3.9 As regards the reasons for discontinuance in 1972, the practice of submitting half-yearly progress reports to the Board on major schemes, the Company has stated in a written note furnished to the Committee that —

"Reasons for discontinuance of submission of half yearly progress report to the Board are not on record. In so far as the major schemes are concerned there has always been a system of submitting quarterly financial reports to each Director of the Board as well as to the Ministry."

3.10 When further asked that in the absence of a regular monitoring system upto April, 1982 and information regarding the progressive expenditure incurred for each of the implemented projects, how did the Board of Directors ensure against time and cost over-runs in the implementation of Projects, the Company has stated that:—

"In the Capital Budget Estimates submitted to Board of Directors, the information relating to projects are separately given in a detailed manner to enable the Board to review the position. Besides this, the Quarterly Financial Report circulated to Board of Directors also contains comprehensive details of projects approved by Government."

3.11 Explaining the progress of monitoring the performance with special reference to achievements of targets etc. the CMD of BEL stated during evidence that:—

"The monitoring is carried out not only annually but is also carried out quarterly, half-yearly and annually by the Board and by the Government. For the last so many years, progress review meetings are also held and a review is carried out against the annual targets and the sub-annual targets. So, to say that there is no target against which it is carried out is perhaps not right. But what is done is that the corporate Plan is broken into a definite annual target which is then approved, and against that target, a monitoring is carried out not only of the financial allocations and the sales turn over, but of each individual item because in the context of Defence that also becomes important. So, a very detailed exercise is carried out by the Ministry every quarter, with the Board Members also pre-

sent. Against each target, appraisal is carried out and then the report is submitted. That is the way it is done."

3.12 The Committee pointed out that the system of submitting half-yearly progress report on major schemes under implementation in BEL was discontinued in December, 1972 and enquired as to what was the present position and whether any progress report on new projects was being submitted to the Board, the representative of BEL replied:—

"The first part is about half-yearly report and I would say that the major project which has so far been undertaken by the company is the Ghaziabad project. It was completed in 1973. In every Board meeting the Project Officer in charge of that unit was called. It is all recorded. There were nine occasions when personal presentation of the project was done to the Board of Directors.

After that between 1973 and now, you will find that up to 1979 there were no large projects sanctioned but only schemes were there. It was, therefore, felt that the quarterly financial statement which is one of the statements regarding the progress made, should be mailed to every individual Director. So, that was being done. Also, a detailed discussion of the scheme takes place at the capital budget stage. Half-yearly progress report of the project was not warranted only in respect of the Panchkula, Garhwal and Tabja projects.

We have taken up the appraisals of the functioning only recently because it was not being done earlier. The Company's internal audit's function used to be internal check function. So, we had to look for experienced persons. This appraisal, therefore, we have taken up only in the last three years. Seventeen such appraisals have been produced so far by various officers and they have been processed and are to go to the Board of Directors."

3.13 On being asked as to what type of mechanism has been introduced in the Company to monitor the implementation of works; to check up the progress and to report it to the Board etc. the Finance Director of BEL stated:—

"The Government have insisted upon the quarterly review at the level of the Secretary. Now we are required to give work-status report on the actual performance in each of the project. Secondly, as far as the Board is concerned,

we are putting up the Status Reports on each of the New project at the meeting of the Board."

3.14 During evidence of Department of Defence Production, the Committee pointed out that BEL had admitted the reasons for discontinuance of admission of half-yearly reports to the Board are not on record. When asked as to what did the Ministry infer therefrom, the Secretary, Defence Production stated:—

"Normally, such a thing should not happen. If the report was introduced under the orders of the Board, or the Chief Executive, it could have been withdrawn after their approval was taken. In any case they should have suggested something else, if not this. Something should have been on record."

3.15 When asked about the role of Ministry's nominees on the Board of BEL and whether they gave any report to the Ministry on their reactions, the witness stated:—

"During the short period I have been here, it has varied from company to company and person to person. In areas where I feel that the problems are more and greater attention is required, I discuss with the Joint Secretary from time to time and they do keep me well informed. I consider them as eyes and ears of the Government on the Board. There they should see whether the Government's policies regarding efficiency, cost competitiveness, cost benefit ratios, reservation of scheduled caste/scheduled tribes etc. are observed or not. They also should see whether any pilferages, frauds or malpractices are going on. Whenever necessary, they inform me orally or in writing... If anything goes wrong, the nominee should be sensitive to that and he should come and give a feed-back to me. In certain cases, I also give specific instructions to be more careful regarding such and such companies and then they also give written reports on which I record my observations. I do not consider it necessary that for each board meeting of these nine PSU, they should come and give a report. When I review their work quarterly, I know their weak areas. Then, the Joint Secretary is also there on the Board. He also keeps me informed about things."

3.16 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, and 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.

3.17 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 consider and approve the project proposals in true perspective, the Committee recommend that the Ministry should issue necessary 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.

3.18 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, Semi-conductor, 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 was 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 over runs. In this connection, the Finance Director of BEL also informed the Committee during evdence that "they have taken up the appraisal 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 to every individual Director and a detailed discussion of schemes takes place at the Capital Budget stage.

3.19 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 noticed. The Committee would like to be apprised of the action taken by the Company/Ministry in this regard.

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.

3.21 Some of the salient features noticed in the implementation of projects are discussed as Under:—

(i) Prolonged Gestation Period of Projects

According to Audit, in the following cases, the gestation period in achieving the level of production envisaged was long:—

Details of Project	Date of Board's Sanction	Capacity to be achieved	Projected date of achievement of capacity	Actual date of achievement
1	2	3	4	5
1. T.V. Picture tubes	November, 1967 Do. December, 1972	30,000 tubes 1,00,000 tubes 2,00,000 tubes	January, 1971 1973-74 February, 1976	1972-73 1978-79 Production of 1,95,000 in 1982-83,20,41,000 in 1983-84.
2. Integrated Circuits Linea- Devices CMOS Digitals	December, 1969 September, 1971	1 million Expansion to 2 millions	1973-74 Not given	Not achieved upto April, 1983. Production level of only 6·74 lakhs achieved in 1981-82, 6·14 lakhs in 1982-83 and 9·88 lakhs in 1983-84.
Augmentation of Mask design and fabrication facilities for generating mask sets of MSI and ISI complexity.	March, 1973	—	1975-76	Mask design capability only upto MSI complexity achieved by September, 1981.
Facilities for Ion implantation and polysilicon process	Jannary, 1978	—	16 months from placing order for Ion implantor	Ion implantation facility commissioned in November, 1980 and Polysilicon process in January, 1982.
3. Microwave tubes of 7008 type: Stage I-Assembly from imported components.	January, 1966	300 Nos.	April, 1969 to March, 1970	March, 1971
Stage II-production out of manufactured components.			April, 1970 to March, 1971.	1971-72

1	2	3	4	5
4. Silicon Semi-conductors-Plastic encapsulation devices	January, 1978	Expansion from 20 millions to 25 millions	Within 2 years from placement of orders for equipment (orders placed during August, 1979 to July, 1980)	Production level of 22·6 millions reached in 1981-82, 24·18 millions in 1982-83 and 21·02 millions in 1983-84.
5. Indicator tubes	September, 1971	1·5 lakhs	Not given	Not achieved upto April 1983 Production closed.
6. Germanium Semi-conductors	June, 1970	Expansion from 10·3 million to 20·3 millions	Not given	1974-75
Diodes	July, 1974	3 millions	Not given	1978-79
7. Silicon Semi-conductors	June, 1970	Expansion from 4 millions to 10 millions	Not given	1979-80
8. Silicon Power divices	September, 1971	2 millions	Not given	1981-82

3.22 According to Audit there was a long gestation period and considerable delay in achieving the level of production for various projects i.e. T.V. Picture Tubes, Integrated Circuits, Silicon Semi conductor, Indication Tubes, Germanium, Semi-conductors and Silicon Power devices. When asked about the reasons for the prolonged gestation periods in achieving the levels of production envisaged for the above mentioned projects, the Company in the written note furnished have stated as under:—

> "Out of the 8 projects, specific dates for achieving expansion in the level of production were not indicated for 4 projects since this was being planned on a phased manner. In respect of one of these projects viz., Silicon Power Devices, expansion of 2 million was realised in 77-78 itself and not in 1981-82 as published in the audit report. In respect of TV Picture Tubes project, there was a slippage of one year at the first stage of setting up of the project and the reason for delays in the production reaching the level of 1 lakh Tubes and 2 lakh Tubes respectively have been given in page 20 of the Report. With regard to the IC Project, production to the level planned was not progressed based on market conditions and other related factors.....In respect of the Microwave Tubes Project, the gestation period got prolonged by a period of less than one year. In the case of Indicator Tubes project, the project was given up, mainly due to the obsolescence factor whereby the tubes were superceded by solid state devices which were allowed for import under the libralised import policies.
>
> All these projects were being progressed for the first time and in the high technology area, where at the time of setting up of the project learning was involved, besides familiarisation, training etc. of Engineers and technical personnel in relation to new technologies."

3.23 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, etc.

3.24 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.

B. *Setting up of Ghaziabad Unit*

3.25 In pursuance of the recommendations of the Bhabha Committee (1966), Government of India decided in August, 1966, to set up a new factory as a unit of BEL, to meet the Defence requirements of Radar, Troposcatter and Microwave equipment required for the Air Defence Ground Environment System (known as the ADGES Plan). In pursuance of this decision, Government sanctioned, in December, 1970, the establishment of the Ghaziabad Unit of BEL at an investment of Rs. 11.5 crores. Necessary technical collaboration agreements with foreign companies were also entered into (one by BEL in February, 1971 and the other by the Government of India in March, 1971 and entrusted to BEL). Ghaziabad Unit went into commercial production in September, 1973 and the expenditure incurred for setting up of the Unit upto 31st March, 1982 was Rs. 1356.19 lakhs (including the expenditure or diversification programme).

3.26 The setting up of the factory was envisaged by the Government keeping in view the requirements of the following equipments as spelt out in the ADGES Plan.

	Quantity
'A' Type Radar	23
'B' Type Radar	12
'C' Type Equipment	40
'D' Type Tropo	53
'E' Type Tropo	26
'F' Type Equipment	20

In terms of value, the 'A' Type Radar accounted for 56 per cent of the total requirements.

3.27 The equipment and facilities set up initially were designed to achieve an annual production of Rs. 1,790 lakhs entirely for the Defence. The bulk of the requirements (59 per cent) related to the manufacture of a particular equipment for which major portion of the facilities set up were to be utilised. There was a drastic cut

in the Defence Plan due to which the expected orders did not materialise and raw-materials and components valued at Rs. 894 lakhs imported from the Collaborators became surplus to requirements.

3.28 In October, 1974, BEL was informed that it should not Commit for the manufacture of the 'A' Type Radar beyond the 5th. There were also reductions in requirements for certain other equipments. Apart from causing the problem of unutilised capacity, this curtailment of requirement of 'A' type radar caused difficulties to the company also in regard to the utilisation of assemblies and sub-assemblies to the tune of Rs. 894 lakhs, which had been contracted under the Collaboration Agreement for progressive use upto the 10th Radar of Type 'A'.

3.29 As the factory was set up to meet the ADGES requirements and as the orders expected were not forthcoming, the company sought compensation from the Government for the financial consequences arising from the short loading of the factory vis-a-vis the installed capacity on the ground that considerable expenditure had been incurred in installing the plant, training the staff and providing the infrastructure for production. The amount of compensation claimed was Rs. 677.45 lakhs besides storage and manufacture charges of Rs. 8.40 lakhs per annum.

3.30 The case for compensation was submitted to the Ministry in June, 1975. The Government [*vide* their letter No. 22(6)/74/D(BEL) dated 25th February, 1977], rejected the claim for compensation on the ground that BEL as an entity was making profits even though one of its units may not be making profits and that 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 and further that the temporary difficulties should be treated as a part of their overall ways and means position and should not be the subject of a claim for compensation from the owner viz. the Government itself.

3.31 When asked why the scheme of compensation was turned down by Government, the CMD of BEL stated during his oral evidence that:—

> "The reasons given was that we were making profit so we should not worry. Ghaziabad plant had in no time, turned the corner and it is making handsome profit today."

3.32 As against the expected production of Rs. 1,790 lakhs under the Defence Plan, the actual turnover, in respect of supplies to Defence was Rs. 478 lakhs in 1978-79, Rs. 756 lakhs in 1979-80, Rs. 1,084 lakhs in 1980-81 and Rs. 1,051 lakhs in 1981-82. As against the total turnover of Rs. 2916 lakhs in 1982-83 and Rs. 3616 lakhs in 1983-84, the supplies to Defence were Rs. 1653 lakhs and Rs. 2685.5 lakhs, respectively.

Diversification Programme

3.33 In July, 1975 the Board of Directors approved a scheme for balancing the Ghaziabad Plant in order to achieve diversified production and profitability in the shortest possible time. The scheme which involved an investment of Rs. 100 lakhs to be treated as a new project, was approved by Government in May, 1976. Under this scheme certain items of equipment, which were under development at Bangalore Unit, were to be transferred to Ghaziabad for productionisation, viz. UHF Radio Relay (LUS 751), VHF sets for Police/ Mobile Equipment (GH301|351 and LVP 313|315) and 2 more items of equipment meant for Defence. Further, 5 more items of equipment viz., 2 items relating to Defence, Micro-wave equipment, Multiplex equipment and Telemetry/Telecontrol equipment, being developed by several agencies (including the Bangalore Unit of the Company) were also to be productionised by this Unit.

3.34 The actual expenditure incurred on diversification programme upto 31st March, 1982 was Rs. 93.33 lakhs in addition to the test equipment valued at Rs. 12.52 lakhs transferred from Bangalore Unit. The items of equipment to be productionised under diversification programme were expected to contribute to a turnover of Rs. 1,272 lakhs from 1978-79 onwards. As against this expectation, the actual turnover upto 1981-82 was as under:

Year	Amount (Rs. in lakhs)
1978-79	84
1979-80	238
1980-81	728
1981-82	1525

3.35 The reasons for not achieving the expected turnover were stated to be as follows:—

(i) Though the diversification scheme was to be launched in 1975-76, to achieve diversified producuon and profitability in the 'shortest possible time' only a beginning was made in 1976-77 and the Unit could not make any headway in achieving increased production. This was because none of the terms transferred from the Bangalore Unit had been firmly established in the regular production line prior to transfer, with the result that the Unit had to tackle many problems relating to design, development, Users' clearance before commencement of regular production, re-engineering, restart, rework, etc. The expenditure incurred towards further developmental effort by this Unit upto 31st March, 1984 was Rs. 43.73 lakhs.

(ii) In regard to productionisation of items developed by other agencies (including the Bangalore Unit) out of 5 items planned one item 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 and another item viz. 4|7 GHZ Microwave Equipment, under development at Bangalore, was not transferred but productionised there itself. In respect of the other three items, the production itself commenced in 1978-79.

3.36 As a result, the Unit incurred heavy losses upto 1979-80 which accumulated to Rs. 1420 lakhs upto that period. However, from 1980-81 onwards the Unit started earning profits, which brought down the cumulative loss to Rs. 509 lakhs to end of 1981-82. The unit is stated to have wiped off all the accumulated losses and by the end of 1984-85, the Unit earned a cumulative profit of as much as Rs. 34 crores.

3.37 In this connection, the Ministry explained to Audit in March, 1983:—

"Since the Company had made an investment of Rs. 31.96 lakhs only to the end of 31st March, 1979 towards diversification plan and full complement of plant and machinery and test equipments envisaged in the diversification plan could be made only by end of 31st March, 1981, the actual turnover for the 1980-81 (amounting to Rs. 18.12 crores including approximately Rs. 566 lakhs of diversification

products) was comparable to the projected turnover of Rs. 18.22 crores after implementation of the diversification plan reported to the Board."

3.38 The fact, however, remained that there was delay in the implementation of the diversification programme by about 2 years.

3.39 Asked as to how did the Company envisage production and profitability in the shortest possible time, when the products transferred to the Ghaziabad Unit were either not fully developed or ready for productionisation. The Company in the written note furnished to the Committee has stated that the expression 'shortest possible time' has been taken from the Minutes of the Board meeting of 9th April, 1975 which are reproduced as under:

"The Chairman informed that the original project estimates envisaged a supply of 23 Nos. of 3D Static Radar to the Airforce. Many items of plant and machinery and test equipments for the manufacture of 3D Static Radars and the Antennas were specialised machines which would not be of any use for diversifying the production. AVM Sabhaney informed the Board that the requirement of 3D Static Radars might not be more than 8. The Chairman mentioned that orders beyond the 2nd one are indefinite though a letter of intent exists for 2 Radars. The Board considered that in view of this reduction in demand the Company should consider diversification of production in the Ghaziabad Unit so as to utilise the capacity. Chairman mentioned that in view of many specialised machines which could not be put to use for the manufacture of other equipments, the Unit might require additional capital investment for diversification. He stated that he would ask the General Manager, Ghaziabad, to examine the pattern of investments and prepare a project report for balancing the plant in order to diversify production and achieve profitability in the shortest possible time."

3.40 On enquiry as to why the items of equipment which were designed and developed at Bangalore Unit were transferred to Ghaziabad Unit, the Company stated in their written reply as under:

"The diversification programme for BEL, Ghaziabad was approved by the Board in their meeting of July 1975, which envisaged the transfer of certain product lines from

the Bangalore Unit to the Ghaziabad Unit. The Board was also apprised in the same meeting that 'a small beginning could be made in that current year itself and after the initial problems normally encountered in the introduction of newly developed equipment in production are overcome, it was expected that these additional equipment will contribute to a steady annual production of the value of Rs. 6 to 7 crores p.a. depending on orders'. 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 factors in the implementation of the diversification programme but getting over the introduction problems. As regards the turnover aspect, the Board paper envisaged that by 1978-79 a turnover of Rs. 1822 lakhs was to be achieved. This level was achieved in 1980-81.

3.41 To fill the gap in Ghaziabad which arose due to the non-materialisation of orders as envisaged in the ADGES Plan, the Company had three alternatives:

(i) take up wholly new products based on know-how to be developed or acquired.

(ii) transfer products whose development had either been completed or reached an advanced stage at Bangalore.

(iii) transfer of products which were in free flow production at the Bangalore Unit.

Alternative (i) was not favoured because the new Unit would be beset with uncertainties. Alternative (iii) also was not an easy practicable proposition. In respect of products for which free flow production had been established after prolonged customer trials, the customers would be expecting a steady flow of supplies as scheduled and agreed upon. Change of line to a new unit would necessarily involve interruption and delays in supplies which would not be acceptable to customers. Moreover, change of line would mean transfer of some production equipment and all testing facilities as well. In the event, alternative (ii) was chosen and products transferred had either been fully developed (like LUS 751) or reached an advanced stage of development.

3.42 During evidence, the Committee pointed out that in the case of Ghaziabad Unit, the product-mix originally envisaged did not materialise due to changes in Defence Plan. As a result, the capacity established remained unutilised for several years. On enquiry whether there was any firm commitment on the part of the Government for placement of orders on the factory, and if not on what basis the product-mix was envisaged, the CMD of BEL stated:

> "After the sanction of the Government for setting up the Ghaziabad Unit was obtained, that unit was set up for manufacture of micro-wave and radar equipment. This was considered a major project on the Defence side. During the company's discussions with the Service Headquarters, it was felt that the type of capital equipment and machinery required to manufacture this kind of radar was different as opposed to the radar being manufactured in Bangalore. This product-mix of the unit was therefore, planned to meet the ADGES requirements and the product-mix was as follows. It was to have three dimensional static radar and three dimensional mobile radar in collaboration with a company of France and sanctioned by the Government of India..... Since the types of requirements were distinctly of a different type, it was considered necessary that we should have a different type of capital equipment and machinery installed at a separate location other than Bangalore. In this connection, the place chosen was Ghaziabad. When the actual plant construction started, the Air Force requirement apparently went in for a little more urgency and there was certain amount of import that was resorted to meet their immediate requirements rather than waiting for the factory to start productioning. In that event, there was a gap between whatever was originally conceived or the initial demand placed on the company and the actual requirement. Therefore, during this gap period, it was considered necessary to start some products which have already seen through some degree in the Bangalore Unit.....A certain number has been ordered on us and it is very much below the figure which was originally anticipated. Hence, in the initial years, there was under-utilisation of the facilities until we found out other product-mixes both for air defence and for other uses, for the army and Navy, there was a period of loss and under-utilisation of the facilities."

Communication System Equipment

3.43 According to Audit, from 1974-75 to 1980-81 the Company produced only 155 sets (71 in Bangalore Unit and 84 in Ghaziabad Unit) as against 840 sets planned and 208 sets for which orders were actually received. The equipment supplied to P&T Department was not found to be upto the required specifications and also not free from defects. Even as late as February, 1980 the P&T Department reported that they were experiencing serious problems in installing the equipment because of excessive faults arising during energisation.

3.44 On the 155 sets produced by both Bangalore and Ghaziabad Units the Company is reported to have incurred a loss of Rs. 299.80 lakhs. The Company is reported to have not assessed the value of redundant materials, if any, consequent on cancellation of the order by the P&T Department. The above loss would increase further to the extent of materials procured which might ultimately become redundant.

3.45 Audit has also observed that:—

(i) After developing equipment at a substantial cost (Rs. 35.64 lakhs) and remaining in the field for more than 6 years, the Company was unable to meet the quality and price requirements of the P&T Department forcing it to cancel the order for some of the sets.

(ii) In view of its inability to meet the requirement of customers both in quality and price, the Company failed to arrest the drain of foreign exchange on the import of equipment by the P&T Department.

(iii) Due to substantial cost over-runs the Company incurred a loss of nearly Rs. 3.00 crores on the sets supplied.

(iv) In spite of instructions issued (May 1972) by the Government on the recommendations of the Committee on Public Undertakings, that the company should make a thorough analysis of demand and cost of production, before undertaking manufacture of any new items so as to minimise losses, the Company embarked on this venture unsuccessfully and incurred a huge loss.

3.46 When asked about the reasons for the delay of two years in the implementation of diversification programme, the representative of the BEL stated:

> "The products planned for diversion to Ghaziabad were not particularly capital intensive. They were to make use of facilities in the factory but a new line of products were being brought in for which there was no expertise available and certain equipments were transferred from Bangalore...The projected turn-over was Rs. 18.22 crores and the achievement by the end of 31-3-1981 i.e. the actual turnover during 1980-81 amounted to Rs. 18.12 crores....The point which the Ministry is making is that this diversifcation arose while keeping to the target of Rs. 18.22 crores...
>
> Normally, it takes two years in terms of the type that were manufactured and it is not something which is abnormal Some items which were required to be a little more concretised in development took longer."

3.47 On enquiry whether any specific time schedule was fixed in the implementation of the diversification programme especially when Board approved the scheme "to achieve diversified production and profitability in the shortest possible time", the representatives of the BEL then stated:—

> "It is fully given in the audit report, started from 1978-79 to 1980-81, we were supposed to make Rs. 18.22 crores by 31-3-1981 against that we made Rs. 18.12 crores."

3.48 At the specific answer to the question whether any time schedule for implementation of diversification programme was fixed by the Company', was not forthcoming the Committee had to point out that they would infer that the Company's scheme envisaged only the achievement of the targets and not the time schedule. Thereupon he witness stated:—

> "I have given it in some details as to what was the production, what was set as the task for Ghaziabad Unit with reference to various years and the comment has come up from the audit quite correctly because what was expected in 1978-79 came up really later by 2 years and that is why the point has come up but the fact was that there was a target set of Rs. 12.72 crores by 1978-79 and it was achieved in 1981-82 and not in 1979. That is why this

comment. Obviously, when the diversification programme was launched, then arose the question of the items and then these three items were concretised and then the quantities they should manufacture depending on the orders were also concretised. Output has to be related to all these items. This is how the whole thing have come up."

3.49 Asked whether any study or examination was made to find out the reasons for this delay in the implementation of diversification programme and to fix up responsibility thereof, the witness stated:

"When the shortfall in production capacity of the Ghaziabad unit came about, an examination was done as to how we can fill up the capacity with some equipment which is required again by the Defence Services and a number of equipments were examined for this purpose for transfer from Bangalore to Ghaziabad—about 3 items—2 in the VHF and 1 in the UHF band for communication was considered. All of them were not totally cleared for production and they were in an advanced stage of development and were going through various stages of trial. It was considered expedient to transfer these projects from Bangalore to Ghaziabad for very obvious and good reasons notwithstanding the fact that there will be a lot of problems during the transfer which was undertaken because there was a gap in production in the capacity in Ghaziabad unit. This transfer took place in the form of brief discussions between the Ghaziabad people and Bangalore people to see what is the stage of development. Our engineers went over there and eventually a plan was made to transfer the materials. So it was very difficult to say in 1975 how long it will take because there was a bit of incomplete development. We put the target by 1978-79. It was a detailed programme but it involved a large number of activities. We had taken various steps and in Bangalore itself it would have taken a little time."

3.50 When further asked whether any specific study was made in this regard, if so, what was the result of that study, the witness stated:

"This is a continuous process. You cannot run an organisation without examination. We meet every month. In

the case of Defence hardware, it is not like that it goes through in the first development stage itself. There is a constant zig-zag battle. Supposing a basic set has been developed and it develops a certain problem. Once that happens then you go through a complete cycle of re-developing that item."

3.51 When asked whether the Audit comments with regard to the delay of 2 years was discussed in the meeting of the Board of Directors of the Company, the witness explained that when the Audit Report came, it was given a lot of serious attention both by the Ministry and the Company. When pointed out that the Board and the Ministry were two distinct entities and as such the Committee desired to know specifically whether the Audit comments were discussed in the Board, the witness admitted that "it has not been specifically discussed in the Board." When again asked whether this issue was at all discussed in the Board or not, the witness stated "Not to my knowledge."

3.52 The Committee pointed out that had the diversification programme of Ghaziabad Unit been properly conceived and implemented with a time bound programme and product in take-off stage had been transferred from Bangalore to Ghaziabad Unit, the heavy loss incurred to the extent of Rs. 1420 lakhs upto 1979-80 by Ghaziabad Unit could have been minimised if not avoided altogether. The CMD. BEL then stated:—

"Perhaps the Audit had in mind that if fully developed items were transferred, this loss would not have been occurred. To our knowledge, even if it happens today we will not do it in that fashion. This requires interruption of that line altogether in Bangalore and then transferring this and that means no equipment being given to Defence Force. So, it had to be conceived that whatever was being continued was allowed to continue and take only those items which are nearing maturity and for those items which require longer time for completion may have to be considered taking into account various other factors. But the first alternative is not a better alternative notwithstanding what the Audit has said."

3.53 As regards productionisation of items developed by other agencies (including the Bangalore Unit) the Audit has stated that out of 5 items planned, one item 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.

and another item under development at Bangalore, was not transferred but productionised there itself. In respect of the other three items, the production itself commenced in 1978-79.

3.54 On being asked as to how the BEL decided to transfer certain specific items from Bangalore to Ghaziabad Unit, the representative of BEL then stated:

> "For transfer of products from Bangalore to Ghaziabad, the entire range of items within the category of items to be transferred, were scrutinised. A number of items which were at various stages of development were thoroughly examined, and it was decided as to which items were to be transferred to Ghaziabad, based on the orders for those items. In this context five or six items were identified. Marine Navigational Radar was one of the items. This was thought of because there was some capability for diversifying this radar, but the orders did not materialise. Similarly, Defence had a number of items under consideration. We were developing a large number of communication equipments in Bangalore.....In other words, the first activity was to identify a broad list of items which could be transferred to Ghaziabad and then based on the actual demand coming for those, they were to be productionised in Ghaziabad, further development was to be completed and the like. The items which were transferred included UHF, the Police Radio Equipment, the Army Radio Equipment and the Multiplex Equipment. These items were transferred because there were orders for these and these had reached certain advance stages of development at Bangalore. The rest of them, like navigational radar, did not find a customer, so, they were left out at Bangalore itself and were not taken up for transfer to Ghaziabad."

3.55 It has also been brought to the notice of the Committee that P & T Department placed order for 80 bays of UHF Radio Relay Equipment with BEL in May, 1974. The quantity was increased to 104 bays in February, 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 order and was to be completed within 18 months, *i.e.*, by November, 1975. This equipment was originally to be manufactured at Bangalore Unit where it had been designed and developed. However, in July, 1975 under a scheme for balancing the Ghaziabad Unit, the manufacture of this item was

transferred to Ghaziabad Unit. P & T Department was not in favour of this shifting of the venue of manufacture as they apprehended delay in supplies and this was brought to the notice of BEL (*vide* their D.O. letter No. 29-1/73-MH3 dated 3-6-1976).

3.56 The Committee are also informed that the equipment manufactured by Bangalore and Ghaziabad Units was not meeting the specification and was having reliability problems with regard to power, supply, system noise performance etc. The equipment supplied was accepted by P & T after impressing upon BEL to improve the short-comings to meet P & T specification. It is further stated that due to heavy delay in supplies and due to inability on the part of BEL to manufacture the equipment to the original specifications and to provide reliable performance, P & T was left with no alternative other than to short close the order upto 58 bays and went in for import of 100 terminals of UHF equipments to meet immediate requirements. According to P & T the equipment procured from abroad in 1979 met the specification and is reported to be giving good service.

3.57 P & T have 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 without any significant improvement in the system specifications. The P & T Department did not agree to this and instead placed order for four terminals on M/s Gujarat Communications Electronics Ltd. in August, 1981 at the rate of Rs. 1.84 lakh per bay against the original price of BEL at Rs. 0.97 lakhs per bay sought to be increased by BEL to Rs. 2.55 lakhs per bay.

3.58 As regards performance of imported UHF system, the representatives of BEL informed the Committee during evidence that the Director (Technical), Department of Electronics had written to Member (TD) of P & T as under:—

> "I was surprised to learn that the imported UHF systems in the southern region are showing worse performance than that of BEL equipment which was not cleared for production for nearly two years. I am afraid that if the P & T transmission branch lays down its own standards and insists on them without taking into account the general environmental conditions, we may not succeed at all in setting up indigenous production of transmission equipment in this country."

3.59 The witness also added:—

"Earlier also, the TRC, technical Directorate of the P & T had examined and had said that the equipment conformed to the specifications and they had approved the quality.....Notwithstanding that, this was the first time that we were working for P & T that that to on an items which was a new item and it had to be developed indigenously. There was no established collaborator for that item. As a result, the product itself in its developmental stage ran into a lot of problems, When it got developed, funds became the problem. They wanted something which was perhaps more state-of-the-art in their reckoning. The fact remains that we entered a new production facility. If we had to do it again, we would be more cautious. When we do such things for the first time, there would obviously be a certain amount of misjudgement and may be some losses. .....We have slipped in our developmental effort. There is no gain saying it."

3.60 According to Audit, from 1974-75 to 1980-81 the Company produced only 155 sets (71 in Bangalore Unit and 84 in Ghaziabad Unit) as against 840 sets planned and 208 sets for which orders were actually received. The Company is reported to have incurred a loss of Rs. 299.80 lakhs. The Company is also reported to have not assessed the value of redundant materials, if any, consequent on cancellation of the order by the P & T Department. The above loss would increase further to the extent of materials procured which might ultimately become redundant.

3.61 When asked as to why did the Company plan for 840 sets when they had firm orders only for 208 sets and it actually produced 155 sets, the representative of BEL stated:—

"A total of 158 sets were made both by Ghaziabad and Bangalore Units put together. There was a cancellation of the order by the P & T because they changed the specifications. But subsequently due to the changes P&T told us 'Our equipment will stop at that stage'. And other people also entered the field. So, what we did was that we converted all the remaining materials and parts to spares because there were many customers who were in need of spares and we have supplied them as spares to all the customers.....This No. of 840 was an internal projection for long term planning. We expected the mar-

ket to continue for a long time.....We purchased material only for 200 sets."

3.62 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 per cent) 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 Radar which in term of value accounted for 56 per cent of the total requirement. As a result of this drastic cut in the Defence Plan, he expected order 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 therefor 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 specific 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 specifically 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 items does not seem to be logical. The Committee desire that in future there should be a machinery to re-

solve 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 under-utilised 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.

3.63 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, Microwave 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.

3.64 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 31st March, 1984.

3.65 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 started 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.

3.66 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".

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 requiremnt 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 and 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.

3.68 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 1978. During evidence, the representatives 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."

3.69 The Committee are of the view that had the fully developed items been transferred from Bangalore to Ghaziabad Unit, machines 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.

3.70 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 days 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 items 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 appre-

hended delay in supplies and this was duly brought to the notice of the Company.

3.71 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 the 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 when in for import of the equipment to meet their immediate requirements. P & T Department has 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. 2.25 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.

3.72 The Committee are dismayed over this lackadaisical approach of the Company in not meeting the quality and price requirement of the 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 field 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 N 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.

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 Undertakings

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.

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.

C. T.V. Picture Tubes

3.75 With the advent of television broadcasting in Inida, the Board approved (November 1967) the proposal for the manufacture of black and white T.V. Picture Tubes at a total cost of Rs 57 lakhs (FE: Rs 24.01 lakhs) based on fixed type equipment, in technical collaboration with Nippon Electric Company (NEC) of Japan, which was sanctioned by the Government in June 1968. The Government sanction contemplated an initial production of 30,000 tubes on single shift basis from January 1971 to be increased to 1 lakh tubes in 1973-74, based on a rough forecast of demand expected to be generated with reference to the only T.V. station then existing (1967) at Delhi. The production of tubes commenced in 1970-71.

3.76 In December 1972, the Board took note of the considerable increase in the expected demand as a result of new T.V. Stations coming up at Calcutta, Madras, Lucknow, Kanpur, etc. Considerin-

that it would be advantageous to establish automatic equipment in certain areas, the Board approved a revised project estimate for Rs. 178 lakhs (FE: Rs. 44.01 lakhs) for increasing the production to 2 lakh tubes per annum on 3 shifts; which was sanctioned by the Government in April, 1974. This estimate was further revised (August 1980) to Rs. 210 lakhs, without giving any reasons for increase in cost of each component of the Project estimate, and forwarded to Government in September 1980. The expenditure incurred upto 31st March 1982 was Rs. 212.25 lakhs. The Board approved (February 1982) further increase of capacity to 3 lakh tubes per annum involving an additional investment of Rs. 96 lakhs (FE: Rs. 5 lakhs). The Government sanctioned this project in July, 1982. Additional capacity is to be achieved in 1985-86. Expenditure incurred upto February, 1985 was Rs. 121.05 lakhs.

3.77 The time schedule for implementation of the project for increasing the production capacity to 2,00,000 tubes per annum was laid down in May 1974 and actual dates of implementation were as follows:—

Particulars of system	Target	Actual	Reasons for delay
Bulb processing .	July 1975	July 1977	Time taken to make the first model and modifying it.
Sealing machine . .	Sept. 1975	Nov. 1976	Import formalities.
Ageing equipment	Dec. 1975	March, 1978	Changeover to conveyorised ageing system from static system.
In-line baking oven .	January 1976	July 1978	Commissioning of in-line exhaust system (on which this was dependent) only in middle of 1977 and one year needed thereafter to design and complete baking system.
In-line exhausting system	February 1976	June 1977	Design problems of dollies and availability of adequate number of dollies only by June 1977.

It may thus be seen that the expansion Project approved by the Board in December 1972 and sanctioned by the Government in April 1974 (after a delay of 16 months) was ultimately implemented after a delay of more than 4 years from the date of Government sanction.

3.78 The following table gives the built-up of capacity and actual production of tubes upto 1984-85 together with reasons for shortfall in utilisation of capacity (as furnished by the Company):

Year	Installed capacity	Actual production	Reasons for shortfall
1970-71	30,000	6,400	..
1971-72	30,000	11,000	
1972-73	60,000	38,000	..
1973-74	60,000	57,000	Achieved with partial working on Second Shift.
1974-75	1,00,000	61,000	
1975-76	1,00.000	59,000	
1976-77	1,00,000	47,000	Disruption due to conveyorisation. There were also labour troubles.
1977-78	1,00,000	71,000	
1978-79	1,50,000	1,34,000	Design of the dollies fabricated by 1977, was found to be defective. The modification of all dollies taken up in 1977, was completed by 1980. As a consequence only the first in line Exhaust (A Fine) was operational. Hence, built-up capacity was only around 1.5 lakh tubes.
1979-80	1,50,000	1,68,000	Extra quantity achieved with partial working on third shift.
1980-81	2,00,000	1,42,000	Entire fourth quarter was lost due to the strike which started on 26th December, 1980.
1981-82	2,00,000	1,70,000	First quarter was affected by disturbed conditions and lockout and normalcy restored only in the 2nd half of June, 1981.
1982-83	2,00,000	1,95,000	
1983-84	2,00,000	2,04,100	..
1984-85	2,75,000	2,09,701	

According to BEL, the increase in the installed capacity from year-to-year has come about by the installation of new machinery or facilities/techniques which increase worker productivity. Of course, the increase has been in response to market demand.

In this connection, an extract from the Annual Report (1978-79) of the Department of Electronics (DOE) is given below:

> "....local availability of TV picture tubes has remained much below the demand largely because of the slow implementation of production plans by Bharat Electronics Limited."

3.79 Thus owing to delay in completing major systems|build-up of capacity and under-utilisation of built-up capacity by the Company, as well as apparent inability to implement the projects by 6 other firms licensed by DOE for production of 3.20 lakh tubes per annum, the gap between indigenous production and demand, which rose from 0.27 lakh tubes in 1975 to 1.86 lakhs in 1981, was met by imports. A part of this gap could have been met by the Company by implementing the expansion programme expeditiously and also by producing the tubes to the full extent of the capacity established. As per available figures, imports during the 1974-75 to 1977-78 alone amounted to 3.45 lakh tubes valued at Rs. 459.02 lakhs.

3.80 In the post evidence replies furnished by BEL, it has been stated that an important cause of the delay in regard to the implementation of the project was the delays by suppliers/sub-contractors of certain critical components vide, for instance, the following:—

(a) Rotary Vacuum Pumps—150 Nos. from Universal Instruments, Bangalore.

Schedule delivery—3 to 4 months
Actual delivery—25 months.

(b) Forging for the Chain Conveyor from Tansi Forgings, Madras.

Schedule delivery—Two months
Actual delivery—18 months.

(c) Diffusion Pumps—150 Nos. from IBT Bombay.

Schedule delivery—As soon as possible
Actual delivery—20 months.

3.81 The difficulties of Suppliers|Sub-contractors, of course, were largely due to the pioneering nature of the technology involved.

being done entirely based on indigenous technology. However, in the recent expansion project, for raising the capacity from 2 to 3 lakhs per year, a purchase and sub-contract sub-committee was constituted to cut short the delays in placement of orders and also to monitor the progress of the purchase/sub-contract items. The Committee consisted of DGM (P&S, G) as Chairman, Manager (ET), Deputy Manager (Pur.), Dy. Manager (Indl. Engg.), Audit Officer, Sr. Engineer (TV) and Dy. Manager (Sub-Contracts) and was empowered to take decisions so that purchase orders/sub-contract orders are placed expeditiously.

3.82 The Committee pointed out that the Board approved in February, 1982 further increase of capacity to 3 lakh tubes per annum involving additional investment of Rs. 96 lakhs. The additional capacity is to be achieved in 1985-86. Asked as to what efforts are being made to ensure that the additional capacity would be achieved in 1985-86 the BEL has stated that the licensed capacity of 3 lakhs tubes has almost been achieved in 1984-85 with the production of 2,91,000 tubes. The availability of (B&W)TV Picture Tubes from BEL is expected to be of the order of 4 lakhs in 1985-86. This will be achieved by improving the productivity of the existing plants and by endeavouring to introduce a third shift by persuading the labour. The availability of tubes during 1985-86 was reported to be of the order of 6 lakhs. It has also been stated by BEL that one characteristic of the demand of TV sets and therefore for TV Tubes is that it was very erratic and un-predictable. Either the demand came up suddenly in spurts resulting in imports or dried up equally suddenly leaving the manufacturers with large inventories. This made production planning exeremely difficult to respond to such quick changes in the market demand. Govt. have had to resort to imports at short notice to meet such situations on a few occasions in the past. Further more, out of a total licensed capacity of 5.20 lakhs p.a., BEL's licensed capacity was only 2 lakhs p.a. Since 1974 there were other manufacturers in the country but their contribution was negligible towards the overall availability of TV Tubes in the country. Out of the indigenous production upto 1975, BEL's contribution to availability was as much as 75 to 80 per cent. In 1975 the total production in the country was 70,000 nos., out of which BEL's contribution was 59,000 nos. In 1978 the total production went upto 1,42,000 nos. and 1,34,000 nos. of it came from BEL.

3.83 The position regarding TV Picture Tubes imported from 1978-79 to 1984-85 vis-a-vis BEL's installed capacity and production as furnished by BEL is as below:—

Year	Imports (Nos.)	BEL's Production (Nos.)	
		Installed Capacity	Actuals
1978-79	1,29,175	1,50,000	1,34,000
1979-80	1,14,004	1,50,000	1,68,000
1980-81	98,594	2,00,000	1,42,000
1981-82	1,89,382	2,00,000	1,70,000
1982-83	83,377	2,00,000	1,97,000
1983-84	1,06,576	2,00,000	2,04,100
1984-85	3,03,244	2,75,000	2,90,701

3.84 On enquiry by the Committee whether the constraints resulting in delay in the implementation of the Project which at times resulted in large scale imports of picture tubes, were beyond the control of the Company, the CMD of BEL stated:—

> "The expansion project was primarily for change-over from the manufacturing system based on manual operations to semi-automatic system. This involved introduction of conveyerisation, in line baking and exhaust furnace and attempts to move the glass bulbs. It should be apreciated that the expansion project had to be implemented without stopping the existing building lay out and the facilities. Conveyerisation and inland baking therefore, were introduced without disrupting the existing production.
>
> Now, for this expansion project we did not seek the help of any foreign collaborator. The entire conveyerisation system was designed and manufactured by the BEL, but for the furnaces since we are not in that business, we had to look for indigenous manufacturer, explain him the need and he in turn had to design and supply the furnaces. In fact, even after the supply a number of modifications were found necessary. These are the difficulties in designs and development work. Also the fact that the current production could not be disturbed led to delay. From this it

could be seen that constraints to a large-extent are outside the control of the Management.

Regarding imports, there was no large scale import of black and white picture tubes after 1975. It is because of our experience and knowhow that we have developed in conveyerisation and semi-automative TV production that today other people in the private sector and the State electronics sector who want to set up black and white production line are coming to us for supplying of machines, for total design and the layout of the plan. So, the delay is because of the way we went about it and the desire not to disrupt current production.

If we had gone in for foreign designs and equipment perhaps the delay would have been less. For the first time we went in for the Japanese technology. Thereafter, when the expansion took place we embarked on the entire expansion project by ourselves in the same premises. Thereafter, the story is that of unalloyed success. As against the capacity of 25000 per month, last month we touched the production of 50,000. If we had taken turn-key project, it would have been quicker."

3.85 The Committee drew attention of BEL to the following remarks of the Department of Electronics given in their Annual Report (1978-79):

"....local availability of TV picture tubes has remained much below the demand largely because of the slow implementation of production plans by Bharat Electronics Limited."

The Committee then pointed out that owing to delay in completing major systems/built-up of capacity and under-utilisation of built-up capacity by the Company, as well as apparent inability to implement the projects by 6 other firms licensed by Department of Electronics, the gap between indigenous production and demand, which rose from 0.27 lakh tubes in 1975 to 1.86 lakhs in 1981, was met by imports. A part of this gap could have been met by the Company by implementing the expansion programme expeditiously and also by producing the tubes to the full extent of the capacity established. CMD, BEL stated:—

"Sir, in 1975, the total production in the country was 70,000 numbers. That is the authentic figure given out by them (Deptt. of Electronics) in another context. Electronics

Department has stated that there were 6 manufacturers in this field including them. 59,000 was our figure. Rest of the units produced 11,000. The total licensed capacity was 5.2 lakhs. Our capacity was 2 lakhs. The 1978 figure is available in the Audit Para. The total production went up to 1.42 lakhs. Our production was 1.34 lakhs. 8,000 was made in five different units, So, I request you to see this in this context."

3.86 The Committee then pointed out that from 1974-75 to 1977-78, the country has imported 3.45 lakh tubes worth Rs. 459.02 lakhs. If the Expansion Project had taken place quickly this import could have been avoided. Thereupon, the witness stated:—

"The shortfall in 1974-75 was of the order of 40,000. In 1975-76 it was another 40,000 shortfall vis-a-vis our installed capacity comes to less than one-third.....We are not the major producer. 5.2 lakhs tubes per year were licensed. In 1974-75, the licence was for one lakh tubes. 4 lakhs were outside us."

3.87 The Committee pointed out that according to Audit Report, the Expansion Project was approved in December, 1972 and sanctioned by Government in April, 1974. It was ultimately implemented fully in July, 1978 after a delay of more than 4 years. When asked whether 4 years was the target time, the CMD stated "Target time was 9 months."

3.88 Asked to explain the delay especially when 9 months schedule was prescribed for the completion of the project, the witness stated:—

"I do not know how this 9 months' limit comes in. The last activity of this expansion programme was to get completed in February, 1976 which comes to 20 months. It got delayed upto July, 1978."

3.89 The Committee again pointed out that whatever the technical reasons, the Company might give, the fact remains that 150 per cent delay was there in so far as the original target of completion was concerned. Either there was something wrong with the Company's original estimates of target or something seriously was wrong somewhere else, the witness then added:—

"There could have been some under-estimation of time cycle involved in various activities. But the difficulties that came up as we went along are also figuring in the Audit Report and I have nothing further to add to them."

3.90 On a pointed question, whether it was under-estimated by the Company, the witness admitted "Yes, by the Company."

The Committee enquired whether the management has examined the question as to whether any human negligence was involved at any stage with regard to this delay, if so, what was the result of that study. The witness explained:

> "The team that worked on this project is a very highly dedicated team and particularly the Project Manager is very much sought after by all the other TV Plant manufactures for the great achievement. So, there was no human negligence.... We monitor all these things because we are equally concerned that the targets are reached. When a day-to-day monitoring or a monthly review takes place, there cannot be any human negligence."

3.91 The representative of BEL also informed the Committee during evidence that entire conveyerisation system of expansion project was designed and manufactured by BEL but for the furnaces. Since the Company was not in that business, it had to look for indigenous manufacturer, explain to him need and he in turn had to design and supply the furnace. The Committee enquired whether any contract was entered into with the manufacturer stipulating the time schedule and did he keep the time schedule, the witness stated:—

> "The plant, including the furnace, had to be designed. Nobody built a furnace like that earlier. We had to get hold of a person who was in the field of building an electric furnace and tell him that this is the type of furnace we require. If we tell him that 'you should agree to do this in six months and if you are not doing it during that time, we are imposing a penalty', no furnace can be built."

3.92 Again asked as to how many times the progress of the Project was reviewed by the management and what were their observations about the abnormal delay, the witness stated:—

> "The management examines all these expansion projects particularly TV. Apart from this, there are so many TV receiver manufacturers who are affected by non-supply of tubes. So, we are under pressure continuously. The management examined such projects very closely, but I cannot give the specific date." .. ..

3.93 Subsequently, in the post evidence reply furnished by BEL it has been stated that "the designs to expand the capacity from 1 lakh tubes to 2 lakh tubes per year was taken up in May, 1974. The project was closely monitoried by the then Divisional Head (Deputy General Manager) and the Additional General Manager who was in charge of all the Components Divisions in the Bangalore Unit. Record of the discussions were forwarded to the General Manager and Managing Director. The dates of such recorded meetings where the project progress was reviewed are 20th April, 1974; 4th May, 1974; 31st May, 1974; 25th September, 1976 and 18th November, 1977. Besides the above dates, there were numerous meetings which were held whose proceedings were not recorded. The then Managing Director (who later became CMD) was personally interested in the fate of this project, and was orally discussing the progress of the project with the concerned executives very frequently."

3.94 On enquiry whether in view of installed capacity having been fixed at present at 2 lakhs tubes was there any proposal for future expansion especially in view of the fact that the installed capacity was almost getting saturated, the witness then explained:

> "Last year, we had decided to put up another plant in Bangalore. In fact, in a very restricted space, we thought that the demand was picking up so much that we went ahead and made the first Robotised Semi-Automatic Plant in BEL with a capacity of 100 thousand tubes. The original capacity was two lakhs tubes which we upgraded to 3 lakhs tubes. Last year about this time, there was a feast in TV parlance in the market. There was always famine or feast and we had to pile up at one point of time about 30,000 tubes in the factories. This pile up was taking place in spite of expansion programme of the TV and due to the demand in the market not picking up. With these three lakh capacity—one lakh in the old plant went into full capacity in September. That is for half the year, it was not there. Last year's figure was 2.92 lakhs. In fact this is for the first time that we crossed the figure of installed capacity. This year we have a full capacity of three lakhs tubes because the plant has been in full capacity production. We have 25,000 tubes every month and it gives us three lakhs tubes every year. We have internally again tidied up the plant and we are trying to make some adjustments. For the first time, during the last few months, we have reached double the installed capacity.

We can have reached the figure of 600 thousand tubes. We are hoping that in the coming festival seasons, sales will pick up in Madras, Calcutta, Bombay and Delhi. In all our depots, there is a pile up of tubes. So, there is a problem, commercially as also in production. We are hoping that with the coming of the October-November months when traditionally in the Indian homes things are bought, this will be liquidated. But we have reached the total installed capacity of three lakhs tubes this year and we hope to end somewhere around 4.5 lakhs tubes because this is gradually going up and in the next year, it will go up to 6 lakhs tubes. There is success story everywhere and some of the others are producing in the region of 2 to 3 thousand tubes per year and all that, and one company called M/s. Samtel, they are reaching a figure of 800 thousand tubes per year today. So, today in the market there is a bit of a glut."

3.95 The Committee were informed that the capacity of TV tubes project might go upto 4.5 lakhs tubes next year as against the installed capacity of 3 lakhs. It would almost double the installed capacity if the market picks up. The Committee then pointed out that the BEL was already having its piled up stock of tubes and if they compare their capacity with the demand, the demand was less but the manufacturing capacity could be even more than the installed capacity. Asked as to how the company fixed the target to go up to 4.5 lakhs especially when the demand for this in our country was very low. The CMD of BEL then stated "our anticipated experience has always been that marketing of TV was a seasonal one."

3.96 When the Committee enquired whether BEL has explored the possibility of exporting TV tubes, the witness stated:—

"Regarding export, the point will only come when the glass shell is made in the country. Today without the basic item of the tube the question of export would not arise..... With the cost that you have to pay for imported glass shell and with the market that exists for black and white tube outside. It does not exist in the developed countries where they have introduced colour TVs. Except Japan, Middle East and most of America, the rest of the world still continue with black and white TV in a large measure. There is a market definitely; there is a certain amount of replacement requiremnet also for black and white TV. The manufacture, by and large, is taking place of black and white tubes. Still the glass shell which is not indigenously produced is not at a cost

which will be comparable with international cost. The total TV tube is not an exportable item yet....."

3.97 When enquired about the reasons for the delay of 16 months in according Government sanction to the project, the Secretary, Department of Defence Supplies stated:—

"Sir, the total time taken is 13 and not 16 months as has been stated. The proposal came to the Government in February, 1973 and it was sanctioned in April, 1974. I have gone through the chronology of the events as to how they took 13 months and.....13 months is not the delay. It is the time taken. The question of delay arises only when one takes more time than what is prescribed. I only submit here that if we had pursued the matter on a day-to-day or week-to-week basis with better project management, etc. I am sure we could have saved some more time."

3.98 When further asked as to what would have been the total time occupied, if not 13 months, the witness added:—

"I do not think that there is any standard timing fixed for any project processing. And in my opinion, it would vary from project to project. As we saw in BEL as also in other projects, it took nearly 2½ years for the Government sanction to arrive and we went into the chronology of the events and the whole question whether we should go in for a Black TV glass tubes or colour TV tubes is to be decided by the administrative Ministry in consultation with the other Departments. I think this process should take at least 6 to 8 weeks. If it requires sanctions of the other Ministries like the Department of Electronics, Planning Commission may be the EFC, PIB, then the time taken will be much more and if all these processes, have to go to the Cabinet or the Cabinet Committee, then some more time will be taken. If, it would have been pursued, as a thing to be done quickly, then we would have taken less time than what we have taken."

3.99 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.

3.100 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.

3.101 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 under-utilisation of built up capacity by the Company and six other private firms licensed by the DOE, the gap between the indigenous production and demand which rose from 0.27 lakh tubes in 1975 to Rs. 1.86 lakh in 1981 was met by imports. From 1974-75 to 1977-78, 3.45 lakhs tube valued Rs. 459.02 lakhs are reported by Audit to have been imported to meet this gap.

3.102 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 in-

excusable, in the context of the outflow of precious foreign exchange to the tune of Rs. 459 lakhs for importing picture tubes. The Committe 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.

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/subcontractors 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 without proper perspective and firm resolution.

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 full 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.

D. *Integrated Circuits*

3.105 According to Audit, the proposal to undertake the manufacture of Integrated Circuits (ICs) on grounds of rapid technological strides in ICs, was submitted to the Board in February 1968. The Board was also informed that a collaboration agreement would enable "economic commercial production practicable within the shortest possible time" and that firms in U.S.A. had taken nearly 4-5 years to overcome various production snags. The Board constituted a Committee (February 1968) to study the matter in all aspects and based on suggestions of the Committee, which took into account *inter alia* demand assessment of 1.156 million ICs over the next 3—7 years and considering that, for both professional and consumer applications ICs were finding wide-spread use, the project for production of 1 million ICs was approved in December 1969 at a cost of Rs. 65 lakhs Foreign Exchange (FE) Rs. 50 lakhs; this was revised in June 1970 to Rs. 122.00 lakhs mainly to provide for a separate building with service facilities. The Government approved the project in January 1971. The estimate was further revised in September 1971 providing for an additional investment of Rs. 46.50 lakhs (FE: Rs. 15 lakhs) on plant and machinery and also on air-conditioning and other service facilities needed in MOS techniques since it would be possible not only to increase annual capacity from 1 million to 2 million ICs but also to establish manufacture of a range of Digital ICs including CMOS type of chips incorporating latest techniques, in addition to linear ICs. This was approved by Government in November 1971.

3.106 A technical collaboration agreement was concluded in March 1971 (to be in operation for a 10 year period) with Radio Corporation of America (RCA) for the supply of design and production information in respect of all the families of ICs which were under their range of manufacture. Before concluding this agreement, the Board was informed that there was general reluctance on the part of the firms in USA to agree for collaboration and only RCA agreed to collaborate with the Company. The collaboration agreement expired in April 1981.

3.107 An amount of Rs. 17.04 lakhs was paid to RCA during March 1971 to March 1974: Rs. 16.60 lakhs towards minimum compensation in consideration of the information and services, licences, rights and privileges made available and Rs. 0.44 lakh 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 1979 to April 1981. The Company actually obtained design information only for 177 and production information only for 146 out of 348 types of ICs covered as per RCA catalogue.

3.108 In this connection, the Ministry informed the Audit in March 1983 as under:

"The production information, i.e. the IC diffusion and assembly operation, is common to families of devices and the information has been obtained for all technologies in the RCA product range, of interest to BEL. The Collaboration Agreement and the fee paid covered not only the range of products being produced by RCA at the time the collaboration was entered into but also those produced by RCA during the currency (10 years) of the Agreement. This was extremely necessary as the IC technology was/is progressing by leaps and bounds with a high risk of obsolescence of products at any given point of time."

3. 109 The table below gives the details of the component-wise break-up of original and revised estimates and actual expenditure upto 31st March, 1984:

Description	Estimate of		Actual Expenditure
	June 1970 (for 1 million ICs)	September 1971 (for 2 million ICs)	
			(Rupees in lakhs)
Plant, Machinery and Equipment (including customs duty)	65·00	84·50	79·48
Building, Installation and Services	40·00	55·00	47·2
Air-conditioning and clean room facilities	15·00	25·00	38·20
Industrial furniture and contingencies	2·00	4·00	13·12
TOTAL	122·00	168·50	177·32

3.110 It may be seen that the actual expenditure against Air-conditioning and clean room facilities and Industrial furniture and contingencies exceeded the revised estimate of September, 1971 by 52.8 per cent and 235.5 per cent respectively. The estimate was not further revised and got ratified by the Board explaining the reasons for cost over-runs.

3.111 The Board also approved during September, 1971 to March 1979, 5 other proposals as detailed below:

Particulars	Date of sanction	Sanctioned amount	Actual expenditure upto 31st March 1984
			(Rupees in lakhs)
Addition of Mask Fabrication facility of Development Laboratory	September, 1971	25·00	62.37
Augmentation of Mask Design and Fabrication facilities for development of Semi-conductor Devices including complex ICS . . .	March, 1973	81·85	79·23
Facilities for development of Ion implantation technology	January, 1978	51·00	59·29
Equipment for developing Trimetal process in manufacture of ICs	January, 1978	29·50	11·90
Augmentation of Mask centre by installing additional facilities *viz.*, photorepeater, contact printer, electronic measuring system, mask-to-mask comparator, etc.	March, 1979	83·00	106·52 (including enhanced customs duty of Rs. 33 lakhs)

3.112 The Company stated in April 1983 that there were 5 distinct phases in which investment decisions were taken consequent on technology needs, *viz.* advent of ICs in USA in sixties and CMOS ICs in 1971, CMOS diversification in 1974, Ion implantation in 1974-75, Mask centre development (1971—75) and Trimetal process in 1975.

The project for Trimetal process sanctioned in January 1978 and implemented at a cost of Rs. 11.90 lakhs was short-closed in January, 1983, on account of steep rise in the price of precious metals *viz.*, Titanium, Platinum and Gold since beginning of 1979 which made the process uneconomic. The Company stated in April 1983 that the plant obtained was being used in the passivation technique in IC manufacture. No time schedule was laid down for completion of the projects while they were approved by the Board. Taking

into account the lead time of 18 months from the date of the collaboration agreement required for establishing production, (as indicated to the Technical Committee in July, 1968). 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. But pilot production started only 1973-74 and regular production in 1974-75 in a temporary location. The building for the project was completed and taken over only in August, 1974 and the air-conditioning of the building, which was an essential facility for the production of ICs, was undertaken during the period September, 1975 to January, 1977. Production had not yet reached even 1.0 million Nos. per annum (actual production during 1981-82 being 0.674 million) although the matched capacity was 1.5 millions. This would indicate the serious handicaps suffered by the project due to omission to fix a time schedule for achieving the rated capacity, absence of a monitoring|reporting system on project execution etc.

3.113 The Board was informed in December, 1979 that 'while a capacity of 2 million ICs was installed in the diffusion stage for 2 technologies (bi-polar and CMOS), assembly capacity was restricted to 0.5 million level to start with pending the build-up of demand.' The Ministry stated in March 1983 that as diffusion capacity could not be easily augmented, a greater diffusion capacity was built into the initial investment and the assembly investment limited to immediate likely needs.

3.114 According to the Company (June 1982) the matched capacity was 0.5 million ICs upto 1978-79 and 1.5 million from 1979-80. The table below indicates the matched capacity, actual production and loss incurred by the project during the period 1977-78 to 1983-84:

Year	Matched capacity	Actual oduc tion	Percentage of utilisation of capacity	Loss during the year (Rupees in lakh)
	(in lakh numbers)			
1977-78	5·00	3·93	78·6	80·81
1978-79	5·00	4·29	85·8	46·86
1979-80	15·00	7·02	46·8	27·58
1980-81	15·00	6·85	45·7	78·55
1981-82	15·00	6·74	44·9	186·10
1982-83	15·00	6·14	40·9	151·51
1983-84	15·00	9·88	65·9	138·2

3.115 It may be seen that the utilisation of capacity had steadily declined from 1979-80 to 1982-83 and the losses had increased from 1980-81. The reasons for the heavy shortfall in production compared to rated capacity have not been analysed by the Company nor have they been reported to the Board.

3.116 According to the Company (September, 1981) low indigenous demand due to availability of far cheaper imported ICs was the main reason for the shortfall in production. The situation had, however, arisen due to the meagre capacity and small output of only a few types of linear ICs of mainly SSI complexity, compared to the larger indigenous requirements of various types as well as the price competition from mass produced foreign ICs.

3.117 In this connection, the Audit has made the following observations:

Out of 177 types for which design information was obtained and 146 types for which production information was obtained, the Company had brought into production 34 types of linear ICs and 35 types of digital ICs; of these the RCA types were 27 linears and 18 CMOS digitals and balance 7 types of linears and 17 types of TTL series digital were developed by the Company.

In this connection the Company stated in September 1981, "The process capabilities in BEL are limited. In bi-polar technology, BEL cannot make ECL devices or schottky TTLs. Introduction of Isoplanar technology or injection logic is not possible with resent equipment. It is, therefore, obvious that BEL will not be in a position to handle a large number of types. Reduction in the number of types is essential to improve yield and productivity." The Company further stated in December 1982 that taking into view the devices which have a long-term prospect in the market and popularity, it had standardised on the production of one radio type IC, 5 T.V. receiver types, one audio type and 13 other types. Besides these standardised types, the Company also manufactured 49 other types during the period upto 1981-82, many of which were being used for in-house consumption. All these devices were, however, of only SSI/MSI complexity except for mask for a few LSI devices.

(ii) There had been heavy accumulation of stocks of Linear, CMOS and TTL Digital ICs and the stock to end of March, 1984 amounted to 32.10 lakhs. The main stress was being given on the production of Linear ICs which accounted for 91 per cent to 96 per cent of the total production.

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(iii) Regarding CMOS digital ICs the items produced related to obsolete CD 4000 A series and there was accumulation of stock of 1.19 lakhs valued at Rs. 9.00 lakhs (manufacturing cost) as on 31st March 1982. The accumulated stock as on 31-3-1984 was 0.58 lakhs valued at Rs. 5.58 lakh. At the same time the ICs actually needed for in-house requirement were being imported. such imports amounted to 1.35 lakhs valued at Rs. 7.12 lakhs during 1978-79 to 1981-82. It is not, therefore, clear why the Company was producing ICs of obsolete design, not actually needed and having established capacities, why ICs were not being produced to the extent of actual requirements, instead of importing them.

The Company stated in April 1983 that the ICs imported were of 34 types of which only 14 types have the quantity potential to warrant manufacture. In respect of these 14 types approval for production of 6 types had been obtained so far (April 1983).

(iv) Regarding digital TTL devices, they were developed by the Company over a 2-year period in cooperation with the Tata Institute of Fundamental Research, Bombay at a cost of Rs. 14 lakhs "as it was thought that TTL range may have a large market as they are standard devices used all over the world." However, as the Company's costs were far higher compared to international prices and as an import ban did not materialise, the Company stopped production TTL series in 1978-79 after producing 3.14 lakh ICs valued at Rs. 42.05 lakhs from 1972-73. As on 31st March 1982 the Company held an inventory of 84.268 TTL devices (cost Rs. 3.32 lakhs), which were moving very slowly even after special reduction in prices. In 1982-83, value of 64, 560 TTL ICs valued at Rs. 2.56 lakhs was written off. Balance ICs calued at Rs. 0.75 lakh were sold/used for in-house consumption. The Project failed to break-even by the end of 1983-84. Cumulative loss upto 1983-84 was Rs. 691.30 lakhs. The maximum production achieved in 1983-84 was 9.88 lakhs numbers unsold stocks by the end of March, 1984 were 2.84 lakh numbers valued at Rs. 32.10 lakhs.

(v) Thus the object of the project proposal of September 1971 *viz.* establishing the manufacture of a range of digital ICs including CMOS types, had not materialised to any appreciable degree so far as CMOS devices are concerned, whereas the venture into the digital TTLS, which even European manufacturers had given up in 1968 itself in the face of American competition, did not fructify.

(vi) Although the proposal for the manufacture of ICs was initially projected by the Company in February 1968 as capable of

commercial viability within the shortest possible time, the project had failed to achieve break even by the end of March 1984. The cumulative losses of the project upto 1983-84 amounted to Rs. 691.30 lakhs. The Company was also not able to achieve the rated annual production of 2 million ICs per annum, the maximum production achieved so far being 9.88 lakh in 1983-84. The sales of the ICs made by the Company have also been poor and consequently unsold stocks have accumulated to the tune of 2.84 lakh valued at Rs. 32.10 lakh as on 31st March, 1984.

3.118 In the written note furnished to the Committee, the BEL has *inter alia* stated:—

"In the absence of an inhouse capability to keep up with fast changing technological scene, it is essential for BEL to continue its association with RCA. It is in this context that BEL has recently extended its technical collaboration with RCA upto December 1990, for a nominal payment of only $50,000 per year. The order of payments for transfer of technical know how for ICs are generally very heavy running to millions of dollars as could be seen from the following figures:

PAYMENT FOR KNOWHOW ACQUIRED/TO BE ACQUIRED BY BEL

1.	Acrian/USA	Knowhow charges :	$ 1,50,000
		Tech. Assistance :	$ 440,000 for 49 RF Device type
2.	Thomson—CSF France	Knowhow charges :	Rs. 14 lakhs to Rs. 20 lakhs per *one device type*
3.	RIFA/SWEDEN	Knowhow :	Rs. 12 lakhs *per device*

The extended agreement with RCA gives BEL continuing access to the know how and technologies that may be developed by RCA, which may be needed for ICs for telecommunication equipment planned for P&T etc. BEL has already under extension terms of the agreement obtained the design knowhow for three colour TV ICs being planned for production in BEL.

It is also understood that Semiconductor Complex Ltd, Chandigarh had to pay one Million US Dollars for only the process knowhow for NMOS/CMOS technologies and additional payment of about $ 100,000 will have to be made for design knowhow for each IC to be made by them."

3.119 According to Audit, 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 single chip, are being produced elsewhere in the world. The Company has totally failed to up date its technology even after a decade of experience and during this period, technology has progressed by several generations in the rest of the world.

3.120 Out of 348 types of devices covered under the collaboration agreement with RCA, the Company 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. Price-wise the Company is not able to compete in the open market and the unsold stock of ICs in the Company is accumulating. The total quantity produced during 1984-85 was 17.23 lakhs, of which only 4.22 per cent were used for Company's in-house consumption; the balance in-house requirements of ICs have been met through imports. In view of the uneconomic scale of production and high costs the project has incurred upto 1934-85 a cumulative loss of Rs. 8.98 crores, which is an out twice the entire investment of Rs. 4.97 crores (upto 1983-84) in this project.

3.121 In addition, another Public Sector Undertaking viz. Semi Conductor Complex has also been set up at Chandigarh for the production of ICs. Thus, there are two Public Sector agencies in the country at present producing ICs whereas advanced countries like UK and France have not even one.

3.122 Asked about the specific benefits (in terms of money) that have accrued to the Company by obtaining design and production information in respect of all the families of ICs from RCA, the BEL has informed the Committee that the Company has been able to establish the production of ICs for the first time in the country and achieved the total sales turnover from 1974-75 to 1984-85 of ICs of the value of Rs. 1139.1 lakhs. The technical collaboration agreement with RCA enabled BEL to absorb technology both the Bio-polar and CMOS Technologies. Facilities for vertical integration in the manufacture of ICs and expertise in indepth manufacturing of ICs consisting of IC design, mask manufacture, Wafer fabrication, IC Assembly, IC Testing and quality and reliability evaluation has been acquired. Asked as to why the Company was producing ICs of absolete design, not actually needed and after having established capacities why ICs were not being produced to the extent of actual

in-house requirements instead of importing them. BEL in a written note has informed the Committee that the CD 4000A device is not to be considered as an obsolete design as usage for this device does exist. The device was manufactured for an in-house equipment requirement and out of one lakh device made, 88,000 Nos. have been used. Due to the marketing of a device with better technical specifications, in-house demand fell, leaving a balance of 12,000 Nos. in inventory. As mentioned earlier, the ICs requirement of BEL are of various types and only in such of those types, which are required in economical quantities and are covered by the RCA agreement, production can be established in the IC Department.

3.123 BEL has also informed the Committee that action is being taken to find market for CD 4000A device by reducing the price.

3.124 When asked whether the Ministry at any time reviewed the working of IC project and suggested remedial measures keeping in view the heavy losses incurred on running the project, the Department of Defence Production has informed the Committee that:—

> "The IC project was not specifically reviewed by the Ministry; but review periodically was done by the Board of the Company which includes Government nominees. This being a high technology area in which the Company had entered into from technological considerations, the losses incurred by the Company could perhaps not be avoided due to the poor market conditions as explained to by the Company. The Company's Board had also observed in this connection that due to the rapid changes in the technology area, the Semiconductor operations of the Company had to be viewed in totality (to include not only ICs but other devices as Germanium transistors silicon transistors etc. in which the Company was also engaged in)."

3.125 Asked as to why the sanctioned estimates revised in September, 1971 relating to (i) Air conditioning and cleaning of room facilities and (ii) industrial furnitures and contingencies were not further revised and not approved by the Board, the Committee have been informed by BEL that since the actual expenditure of Rs. 176.73 lakhs was in excess of only 4.9 per cent over the sanctioned amount of Rs. 168.50 lakhs, it was considered that no specific approval need be sought for parts of the project where actuals had differed from estimate. The price escalation from the

date of sanction to the date of undertaking the Air conditioning facilities, etc. contributed in a large measure to this cost over-run.

3.126 Asked as to what specific benefits accrued to the Company by obtaining design and production information in respect of all the families of Integrated Circuits from Radio Corporation of America (RCA) as a result of technical collaboration agreement with them, the CMD of BEL stated:—

> "In the preceding 10 years, that is, from 1974-75 to 1984-85 the total sales value was Rs. 1139.1 lakhs. The agreement enables us to import this technology from RCA. There was reluctance on the part of the manufacturer at that point of time. We wanted in-depth production process know-how for going in for I.C. In many South-East Asian countries it is not done. It is known as Cosmetic Manufacture. It is not diffusion which is an in-depth work. We said that we should manufacture in-depth, not just Cosmetic manufacture. But there was reluctance from many foreign countries except RCA who ultimately agreed to give us this technology. The State Department's clearance came in and know-how came in. We got IC design, mask manufacture, wafer fabrication, IC Assembly, IC Testing and quality and reliability valuation was obtained. That was the qualitative gain and in terms of value, I have given you the figure."

3.127 The Committee enquired that out of 348 ICs covered by Agreement with the Collaborators why only 146 items have been taken up. The witness then explained:—

> "Process information is available for the entire lot of 348.
>
> Out of this entire range we can get anything we want. But you have to pay small sum of money for each item, that is, US one thousand dollars. That is for Mask data and magnetic tape. Upgradation took place in that technology. Now we make 150 ICs..... The collaboration agreement stipulated some fee for process know-how. If you want mask data and mask information then you have to pay additional US one thousand dollars the collaboration agreement gave us access to that thing. But it all depends upon market conditions. You pay extra thousand dollars to get mask data to process that IC with the process know-how supplied by them."

3.128 Asked whether in the last 14 years, the BEL has acquainted itself with the technology or not, the witness replied that we have acquainted ourselves with the technology that is how we are able to produce this much and market them also. As heavy payments were made to American company for import of technology, the Committee enquired whether the payments made were commensurate with the benefit derived therefrom. The CMD, BEL stated:—

> "I will correct any such impression. Now electronic telephones are going to be introduced in the country. There are three types of companies, M|s. SHNEIDER, M|s. ERISESSON and M|s. I.T.I. This is for Electronic Telephone. We are required to make bipolar ICs which are of two varieties and we shall be going in for them. For one particular IC it is manufactured by the Company called Rifa, they asked for Rs. one crore for in-depth manufacture. We are not prepared to pay that, we shall have to see. Perhaps it was possible at that point of time to make the payment of Rs. 17.04 lakhs for transfer of technology of 348 types of ICs. Even on the high side we can say that this particular Company RCA is not today the foremost company in the world either. But we thought it was a reasonable thing. We had not much of choice at that time."

3.129 The Committee, then pointed out that technology was available with Japan and other foreign countries but at that point of time, it was considered by BEL to have collaboration only with RCA. The witness thereupon stated that it was a well-known commodity and other companies were not interested in passing the know-how to BEL. The Committee then pointed out that East-Asian countries who were manufacturing their own ICs did not collaborate with RCA or other countries and they have developed their own techniques. But within 14 years, the total technology for the manufacture of ICs was not made available to BEL whereas within a few years several East Asian countries have manufactured ICs which are sold in India, at very cheaper rates. When asked the reasons therefor, the witness stated:—

> "In the manufacture of ICs there is a cosmetic manufacture. It is more of an assembly operation. For specific reasons Bharat Electronics was asked to undertake in-depth manufacture. In India there are many agencies who are making it."

3.130 The Committee then enquired as to how could the small and backward countries come up with the manufacture of all types of ICs within 3 or 4 years, to which the witness replied:—

> "All these companies started off with the import of know-how .....Japan, South Korea or anybody else—all started with American know-how.....Secondly, these countries have the multinationals operating there.....All these countries started off with American technology. In the case of some of the smaller South-East Asian countries, the multinationals set up off-shore assembly facilities. There was no transfer of technology. There are only assembly facilities because of the cheapness of labour there. Japan because of its technological strength was able to build up the strength that they have acquired from America. They are now exporting back to America these memories (ICs)."

3.131 Asked whether the BEL has accepted this RCA technology or they have developed further technology on their own after acquiring this technical know-how, the witness *inter alia* stated:—

> "With the technology from RCA about RCA manufacturing, we have in a very small way been able to develop ourselves certain types of ICs. I do not remember the precise number today. I think, it is about 11 or 12 types which we have designed and produced. In fact, one of the types is BMO 25 specially developed for ITI for use in the Exchanges and we supplied them. One of the limitations for development of a larger number of types has been computerised design facility which we have is a very old type with limited computational power. Unless we upgrade this, it is difficult for us to have more sophisticated ICs. Another thing is, about mask making facility. The mask facility which we have today can go up to 5 micron level only. Beyond that, you require to have more sophisticated equipment which we do not have. The third thing is, high investments are required to go in for more upto-date computerised design facility or mask inspection facility and also for the process of manufacture like diffusion furnaces, assembly equipment etc. We are unable to produce internally from the ICs production activity because there has not been sufficient volume of production. Therefore, it is a vicious circle. There is not enough business in this to generate profit which can be ploughed back in updating our facilities.....In most of the IC plants abroad, today, nobody thinks of anything less than 500 millions a year as

the minimum economic quantity for production. In the case of BEL, this year's target is 3 millions and last year, it was something like one million. So, we are in different line altogether. Therefore, comparison with Japan and all that is not fair."

3.132 The Committee pointed out that this Integrated Circuit Project (Cost Rs. 497 lakhs) was implemented in collaboration with RCA for production of 1.5 million ICs. The Corporation paid to RCA Rs. 17 lakhs between March 1971 to March 1974. The BEL has obtained design, information for 177 types out of 348 types available in the RCA catalogue. The production information was obtained only for 146 ICs and again out of these 146, the BEL produced only 127 linear ICs and 18 CMOs digital so far. The Company has also been importing simultaneously some of the ICs for its own requirement and their production is also low. While the integrated circuits are available in the indigenous market, the production has also comparatively gone down and as a result the total loss incurred on these ICs upto 1983-84 was Rs. 697 lakhs and in that way the BEL has drained away the entire investment. Thereupon, the representative of BEL explained:—

"Let us first take the type required for equipment production, in-house consumption. We, as a company, import lot of variety of ICs, not many of them lending themselves to volume production. Also not all of them are covered by the RCA process. Anyhow, ICs are of different types, geometries and functions. During 1984-85 we imported 400 types of ICs of the volume of about Rs. 40 lakhs. No company in the world manufactures all the 400 types. We would have imported 10 or 12 or 15 different types. Companies specialise in certain range of ICs like the linear etc. Therefore, to expect the BEL to produce only single IC that is required either for its own use or for the rest of the country, is never going to take place.....The ICs that have the highest volume are those which are used in the consumer electronics industry, TV, the radio and colour TV, etc. . . . We manufacture them and are 80 per cent self-sufficient. The reason is that there are certain fluctuations in the market. Sometimes there are short-falls in production because there are production constraints. It is out of the question that we, as a company, can produce all the types of ICs required by the country. We had initially set for ourselves a figure of 50,000 ICs for production, as the minimum required to productionise it. Now we came to

know that this is something ridiculous on our part to fix such a high target for ourselves. In international terms, 50,000 is considered as a prototype approach on the part of any company. So we decided to take a small figure. 34 types of ICs were identified and we took up production of them for in-house consumption, for professional ICs and for military ICs. They are not the consumer electronics grade. They have to be made to specifications. We have been using these 34 types within our own indigenous designs."

3.133 The Committee then pointed out that IC Project was estimated below Rs. 500 lakhs but the loss suffered upto 1984-85 was more than Rs. 898 lakhs and project is also stated to be a losing concern. Asked when will it have a break-even and has any plan to reactivise it been formulated, the witness then stated:

"The losses have been coming down in the last couple of years. With the volume increase the loss is also coming down. We hope to break-even in the next financial year or the year after that."

3.134 As regards expenditure on industrial furniture, the Committee pointed out that BEL has estimated Rs. 2 lakhs in June, 1970. It was revised to Rs. 4 lakhs in September, 1971. But actual expenditure incurred upto 31st March, 1982 was Rs. 37.62 lakhs. When asked to explain this jump from the revised estimates to the actual expenditure the Finance Director of BEL stated:—

"The estimates were made in September, 1971 but the actual work could be taken only in 1974 because of the delay which we have already discussed last year and, therefore, there have been some escalation during this period and that accounts for 50 per cent. We take specific approvals sub-estimates-wise. The total figure is Rs. 168 lakhs and over that the excess was not significant. There was no separate sanction.....We do not go for separate sanction upto 10 per cent escalation. We interpret that as the total figure. That is why, these have not been recorded."

3.135 The Committee pointed out that in respect of two items viz. air conditioning and clean rooms and industrial furniture, it is not just cost over-runs but it is to a very considerable extent, something wrong with the original estimate. In case of air-conditioning, the original estimates was Rs. 15 lakhs in June, 1970 which was revised

to Rs. 25 lakhs in September, 1971. Just in one year and three months it shot up by Rs. 10 lakhs. Again in the case of industrial furniture, Rs. 2 lakhs were asked for in June, 1970. It was revised to Rs. 4 lakhs in September, 1971 but the actual expenditure incurred upto 31st March, 1982 was Rs. 13.30 lakhs. In view of the wide variation, the Committee enquired whether the original estimate was defective in certain respects or the rise in expenditure was because of over spending. It was also enquired whether the Board had ever gone into this matter and what were their views. Thereupon, the Finance Director of BEL explained:—

> "Coming to the Air Conditioning, Rs. 25 lakhs was approved by the Board. But not Rs. 37 lakhs because it was not put up to the Board. In the case of Industrial furniture also Rs. 4 lakhs was approved and not Rs. 13 lakhs."

3.136 When asked whether the revised estimates were got approved by the Board or not, the witness admitted that "we have not done this, Sir." The witness also admitted that "it has been an estimating error". The Committee pointed that when the Company puts up a proposal to the Board instead of the amount involved, they state certain components and that each component would cost so much etc. The Committee, therefore, enquired whether in a particular case where the cost variation was so wide, was it not proper to bring that to the notice of the Board. The CMD of BEL then stated:—

> "Sir, we get your point. The means even if 10 per cent has not been exceeded but the various important components as was reported to the Board, if that is grossly exceeded then it should be reported to the Board. That point is well taken but I must be very candid that this was not done in the particular case."

3.137 The Committee enquired as to how the demand for ICs was calculated on the basis of which the Company projected the commercial viability of the project, the representative of BEL stated:—

> "When we took up the manufacture of digital ICs we wrote to the prospective customers, namely, ECIL and ITI. They were the two major professional manufacturers. We told them that this is the range of ICs that can be manufactured and asked them about their requirement for the same on the basis of their manufacturing plant they indicated the quantity and the time frame. That was the

basis on which we got the design know-how from RCA but because the development plans of ECIL and ITI did not materialise as the same were overtaken by the later advanced development. That is why those expectations did not materialise."

3.138 The Committee pointed out that in the context of meeting the demand for electronics equipment, the things were moving very fast and what is considered relevant today, may become obsolete tomorrow. Asked as to what steps had been taken by BEL to meet the situation; how were they going to keep pace with the changing development, the representative of BEL stated:—

"Basically, I would like to submit that we are not in a stage where we can claim that we are in a position to cope with this fast changing world of ICs. It is because of limitations in the design and development, in not having access to the new processing technology in the ICs and the fact that we do not know what the ultimate volume is likely to be because there is no standardisation of ICs in terms of the end product. What we are trying to concentrate on is the types of ICs for which we see a recurring demand every year which is viable in so far as our scale of production is concerned. In terms of professional grade roughly 10,000 per year are what we consider viable. In terms of consumer grade electronics, their price is very important. Professional grade can bear a slightly higher prices. We take 50,000 as the minimum requirement. But that is not one year's requirement. There is a recurring demand of 4 to 5 years which is taken into account before going into the production of ICs. As it is, the present requirement of consumer electronic equipment and the professional grade which is required for ITI use, is going to exceed 10,000. In the next couple of years, we can exceed the professional grade ICs mainly required for the telephone instrument as well as telephone switching system."

3.139 The Committee enquired about the justification for importing ICs especially when production capacity was lying unutilised, the CMD of BEL stated:—

"The cut off point taken for professional grade ICs required for professional equipment is 10,000. When the full requirement is very small, it is not worthwhile to manufacture it. Out of 396 being imported, four ICs are necessary

where the volume required is beyond 10,000. In any other country, even this small number of 10,000 is a very very low requirement. But in our country even if the requirement is 10,000 since the capacity exists, we must make it. But there are very large number of cases where the figure is short of 10,000 even then we have gone below this figure."

3.140 When specifically asked whether the Company was going in for imports for those items for which our requirements were very small and their production cost would be very high, the witness admitted, "Yes, Sir."

3.141 Asked whether BEL had explored the possibility in the international market, the representative of BEL *inter-alia* stated:—

"The world production of ICs in 1984 was 26 billion dollars worth; out of this, 24 billion dollars worth ICs are made only by Japan and U.S.A. Europe, South-East Asia and all other countries put together make only the balance 4 per cent. These countries are able to dominate the world because of the heavy investment that they have made with Government assistance and they are able to come out with newer products. That sort of situation does not exist in India and if as a country we have an ambition of doing that, it is a programme which the Government alone can do, not BEL.

There is already the National Micro Electronic Council, a very high power committee in existence for this purpose."

3.142 According to the Press Reports, the venture regarding the IC has not at all been taken up by the three countries— UK, USA and Japan. The Committee asked if that was the case why had to BEL chosen this project and how it was cleared. The Secretary, Defence Production stated:—

"Even countries like Japan which are in certain areas like technology, going ahead of USA, and newly advanced countries like South Korea, Taiwan and Singapore function as off-shore assembling units for big companies. The question is: if the investments required are so huge, should we at all go into this field of indigenous reliance? At that time, the Company and the Government thought that we should make a beginning. So, we approached more than one potential suppliers of knowhow. Only one responded, with whom we entered into a collaboration agreement. But the pace of change in technology in this area has been so fast that we are nowhere near what we would require in the years to come."

The representative of Department of Electronics then added:—

"The integrated circuits were at the level of what we call small scale and medium scale, when BEL decided to go into production. Today, there are other circuits in addition to IICs. When people use very large scale integrated circuits, even when you go in for collaboration you will find that for these proprietary parts, they will charge very heavily. So, we should have some competence to manufacture them."

3.143 The Committee pointed out that at present 75 per cent of what BEL produced is used for Defence purposes. The ICs manufactured by BEL are not even first generation products as are being manufactured by other countries. The Committee wanted to know as to why have the Government decided to sanction this project wherein the country has incurred a loss to the extent of Rs. 9 crores. The representative of Department of Electronics stated:—

"In early '70s., it was never predicted that our need for large scale and very large scale items would come to this level, and that at the same time prices would crash in the world market. In order to have competence in the country, as also meeting the demands predicted, perhaps BEL went into it.....The type of circuits which BEL is now manufacturing, most of the European countries have given up. They are going into very special types of circuits. Their investment is very high. For example, you take the United Kingdom. When they found it difficult to produce large circuit, they set up a company in the United States with the UK investment of more than 100 million pounds. If you see the last three years balance-sheet you will find that they are also in loss in the competition. It is really a very competitive market. It was not really predictable. What is the picture today, this was not the picture in 1972. Today, if you want to meet the requirement of the country, you may need to put more investment so that they should be able to produce it."

3.144 The Committee pointed out that when the country was not in a position to invest so much money, what prompted BEL to produce this product (ICs) the witness then stated:—

"ICs are not mainly for Defence; they are for both. The prices that we get in the international market depend upon our future product. If we have indigenous capability, then we get components at the clumping prices. We have also to understand the complexity of this particular technology in order to see that even if a part of it has to be imported, we get it at a reasonable price."

3.144A In this connection, the Secretary, Defence Production also added:—

"You have rightly mentioned that the Company has incurred a loss on this. There are two points which I would like to mention in this connection. As per company perception and as per company record, this project is not reviewed in isolation but as part of the total project; and in this, they have not incurred a loss; they have made profit. Even if we take it in isolation the company has given the government to understand that in the next two years or so, they will stop making losses even on this. In addition, as my colleagues said, we have seen it in the case of ONGC equipment; we have seen it in the case of many other cases, machine tools. For example, until we were capable of making off-shore vessels, etc..... It is a fact in international trade that if my capacity is limited then I am certainly not in a position to dictate terms or do hard bargaining and I have to buy at whatever prices they ask. For example, in the case of off-shore rigs, as long as we were not manufacturing these rigs, they were charging us 100 per cent more than what they are charging now after we started manufacturing these rigs in our country..... We started with ICs. We switched over to MSI three years back. But the growth of technology in this area has been ICI, MSI, LSI and all that. If we want to be at par with the world technology. I personally feel that we do not have the necessary resources nor time. But if we move forward gradually, to that extent, we save our time and foreign exchange. A nation like ours cannot afford to have a situation like go or no go. Sometimes, we succeed; sometimes we do not. If it is purely a commercial propcsition, then what you say is right. But it is not a totally commercial proposition."

3.145 The Committee were informed that the manufacture of ICs should not be looked from commercial angle because it is only development of technology. Asked as to why should this technology be developed at the cost of the nation, the representative of Department of Electronics stated:—

"When the project was conceived in early seventies the picture was not that gloomy. What we are trying to do at the present moment is not to go in for products which are required in large quantities like ICs in television in digital watches. But it is necessary for this country to manufac-

ture ICs though in small quantities, for strategic areas. In that connection, Secretary had mentioned that making those products in small quantities just to keep the technology alive, may not be profitable. We are not investing huge amounts. But we must achieve a certain level so that our strategic demands can be met."

3.146 In this connection, the Secretary, Defence Production also added:—

"Now, we have reached a stage where these projects can be viable. I submit for the consideration of the Committee whether it is the right time to give it up.... The country will have to take a policy view on this. The Micro-Electronics Council is looking into this.

Once a national policy is laid down, then we will know which way we will have to go and how far we will have to go. This issue cannot be decided at the level of the BEL or at the level of Defence Production Department."

3.147 The Committee note that the proposal to undertake the manufacture of Integrated Circuits (ICs) for production of 1 million ICs 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.

3.148 For this purpose the Company concluded a technical Collaboration Agreement in March, 1971 to be in operation for 10 years 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, 1980. 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.

3.149 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 obsolescence of products at any given point of time.

3.150 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 furnitures 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. 38.20 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 approval of the Board.

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 match-

ed capacity was 1.5 million. This indicates 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.

3.152 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 31st March 1984.

3.153 The Committee fail to understandas 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.

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 and 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.

3.155 However, another Public Sector agency viz. Semi-Conductor 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 Semi-Conductor Complex, Chandigarh or to some of the universities or IITs and devote the resources of BEL in some other fields.

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 TTL devices.

3.157 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 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.

3.158 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."

3.159 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 single 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.

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 major 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 plant 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 hte possibility of acquiring the new and the latest IC technologies from some other sources in or Japan to meet effectively the present and future requirements of country.

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 availed 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 Committee, therefore, 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.

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 consequenly 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 the meagre capacity and still smaller output of only a few types of linear ICs of mainly SSI complexity in the face of larger indigenous requirements of various types as well as the price competition from mass produced foreign ICs. The Committee recommend 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.

3.163 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 the BEL has also admitted that "it has been an estimating error." The Committee trust that such matters will be taken care of in future and similar situations will not recur.

3.164 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

The Committee desire that the Company should lay down suitable instruction in this regard so that similar situations do not recur in future.

3.165 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.

3.166 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.

E. *Silicon Materials Project*

3.167 According to Audit, in the important field of silicon materials manufacture, the Company's capability was restricted both in range and volume. It produced only single Crystal material Large scale requirements of Monocrystal Bars, Polished|Lapped Slices and Epitaxial Slices and Multilayer variety for Power Devices and Integrated Circuits were beyond the Company's capacity at present and these are being imported. Other important areas in the Company's capability were the ultra pure materials of Gallium and Selenium required for Semi-conductors' and the Ceremic material of Ferrites required for high frequency Circuits, etc.

3.168 The capacity for manufacture of silicon materials installed in the Company upto 1973-74 was for conversion out of imported Polycrystalline Bars. As it was adequate only to support the production of small Signal Silicon Semi-conductors, the Company had been importing its additional requirements of silicon materials for the production of Integrated Circuits and Power Devices since 1974-75 and 1976-77 respectively. Information regarding

the actual value of imports of silicon materials (for want of production facilities) during these years was not furnished by the Company as stated by Audit. But the imports during the period 1980—85 were estimated at Rs. 127.00 lakhs per annum (Dec. 1980). The Company has all along been importing the materials.

3.169 In January, 1978, the Board of Directors approved a proposal for expending the capacity for the manufacture of silicon materials by introducing higher diameter Monocrystal Bars (out of imported Polycrystalline Bars) and certain types of Silicon Epitaxial Slices required for silicon small Signal Devices, Power Devices and Integrated Circuits with an investment of Rs. 176 lakhs (FE: Rs. 104 lakhs) to achieve the following objectives and benefits:

— Processing of large diameter Wafers upto 75 mm in keeping with international trends and in order to obtain improved yield of diffused chips and reduce manufacturing cost;

— a net proft of Rs. 296.62 lakhs was anticipated over the payback period of 7 years with an annual average return of 22.5 per cent on the investment on straightline method or over 8 per cent on discounted cash flow method;

— foreign exchange savings of Rs. 213 lakhs over 5 years (1980-81 to 1984-85);

— avoidance of unnecessary build-up of inventory of assorted materials required in various resistivity ranges and of import of substandard materials;

— flexibility for change of product-mix in tune with fluctuating market demand of types and quantities; and;

— timely and correct materials support for developmtnt programmes.

3.170 Though Government sanctioned the Project in September, 1978 and foreign exchange and licence for import of capital equipment were released in 1979, the Project which was to have become operative by January, 1980 was deferred in December, 1980 for want of finance. In this connection, the Chairman of the Company expressed concern during the meeting of the Board of Directors held in December, 1980 that 'a critical project from national angle should have to be deferred for want of finance.'

3.171 As the project was originally intended to be financed from internal resources and as the generation of internal resource was satisfactory, it is not clear how funds were not earmarked for implementing this critical and highly productive project. In this connection, it is interesting to note that while the Company deferred this project, 3 new firms in the private sector were implementing the schemes and several other manufacturers have expanded their in-house facilities for single crystal products.

3.172 The Company stated in May, 1982 that problems of logistics of supply and transportation as well as high purification in respect of the critical input material of Argon gas (which is a by-product of fertiliser plants) led to investigation of the possibility of locating the polysilicon project in the campus of one of the Fertilizer corporations. Though the issue of availability of Argon gas was stated to have been resolved in 1981, with the availability of Argon gas and transporting the gas to Bangalore at economic costs, the Project was ultimately given up in October, 1982.

In this connection, the Ministry stated in March, 1983:—

> "The Project for manufacture of silicon materials was envisaged, as in 1977-78 the international market trends showed that a serious shortage situation was likely to develop in respect of polysilicon which is the raw material for Semi-conductors line. The fears about the likely silicon shortage which persisted right upto 1980 eased by early 1981 when the picture began to change rapidly. New supply sources and expansion of existing facilities coupled with the non-fructification of the expected boom in demand abroad reduced the urgency for the Project. In the meantime some other Indian parties also set up manufacturing facilities for single crystal silicon and saved BEL from investing heavily in avoidable vertical integration. The delay in proceeding with the project due to the reasons mentioned above has turned out to be advantageous to the Company."

3.173 In the written note furnished, the BEL has stated that the approximate value of import in terms of foreign exchange of Silicon materials from 1982—85 was 45 lakhs (Rs. 6 lakhs in 1982-83, Rs. 10 lakhs in 1983-84 and Rs. 29 lakhs in 1984-85). The value of imports for the earlier period from 1974—1982 was Rs. 126 lakhs.

3.174 The criticality for the Silicon material arose at a point when BEL had proposed taking up the Project. The position eased subsequently and the project was not hence pursued further. As far as the Company is concerned, 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 sectors parties like M/s. Siltronix which have made similar investments.

3.175 Ministry of Defence Production have informed the Committee that the "Government allowed BHEL, BEL and a few private parties to set up plants for monosilicon at the time when the shortage was anticipated, and a huge demand in the country was foreseen. BHEL did not go ahead and BEL also did not go ahead. Two private sector firms who went into operation are in deep trouble, since even for a four tonne plant they have not been able to get even one tonne loading.

3.176 The Government was not approached by BEL for funds as it was not convinced of the wisdom of continuing the project subsequently even though the Company had itself sought and obtained sanction for setting up the manufacture of monosilicon."

3.177 The Committee enquired as to on what basis the BEL thought of setting up this project in 1979. The project was sanctioned by Government in 1979, foreign exchange therefor was also provided but the Company is reported to have failed to establish the same for want of finance. In this connection, the attention of BEL was invited to the following passage from Audit Report:—

> "As the project was originally intended to be financed from internal resources and as the generation of internal resources was satisfactory, it is not clear how funds were not earmarked for implementing this critical and highly productive project. In this connection, it is interesting to note that, while the company deferred this project, three new firms in the Private Sector were implementing the scheme and several other manufacturers have expanded their in-house facilities for single crystal products."

3.178 The CMD of the BEL stated in evidence that it had turned out advantageous to the Company to abandon the project. The country's interest has not suffered. When the Committee pointed out that the BEL has allowed the private entrepreneurs to enter

into the field, where the BEL was expected to start, the representative of BEL replied:—

> "The anticipation at that time was that a very large quantity of mono-silicon would be required. And what Government did was they allowed BHEL, BEL and some private parties to set up industries. At that time there were two things; one, a shortage of mono-silicon all over the world; and the second, anticipated huge demand in the country. But what happened subsequently was this. BHEL did not go ahead and we also did not go ahead. Only two are in operation, and those who went in for making this are now in deep trouble. The expectation that the country was going to have a huge demand has not taken place. It is good that we did not go ahead....
>
> It is unfortunate that full picture was not presented at the Board meeting... .
>
> In fact, we also wanted to set up a similar plant. But now we realise that if we had done that, we would have been in serious trouble."

3.179 The Committee pointed out that the Government had asked BEL in 1973-74 specifically to take up manufacture of silicon material but till date they have not developed indigenous technology for the silicon material and the country is depending upon other countries for that. Thus, the major task entrusted to BEL by Government has not been fulfiled and company has completely failed in developing indigenous technology. Thereupon, the Finance Director of the BEL stated:—

> "Silicon consists of two parts—one is manufacturing of the raw silicon and the second is from the poly silicon to pull it out into mono silicon. The first stage of manufacture of silicon material is a very high cost project. There is a project set up for this in Gujarat with collaboration from the United States. Right now we are importing poly silicon and the project of pulling it into mono silicon is entrusted to BEL. The same plant which we are to set up and has been set up by Siltronics in Hosur. But, they are in doldrums because for a four-tonne plant they have not been able to get even one tonne loading."
>
> ....

3.180 The Committee again pointed out that the BEL was entrusted the manufacture of silicon material in 1973-74 but the Mettur Chemicals was reported to be in doldrum in 1983-84. Asked as to what the Company had done during the last 10 years the witness stated:—

> "That what we were supposed to make in this plant are easily available in the three plants. The Mettur Chemicals project is making that type of silicon with which we are not concerned. Our function is the second stage. The second stage is to pull out mono silicon from the poly silicon.
>
> The basis for the Company starting this project was an anticipated shortage of mono-crystalised silicon fibres in the market. Within the short time of taking the approval of the Government it became clear that there was not going to be any shortage of silicon in the world. Therefore, the entire basis for proposing the project has been demolished. Therefore, we felt that there was no need for us to do it and the subsequent events proved it right."

3.181 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.

3.182 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.

3.183 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 abandonement 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.

NEW DELHI;
April 28, 1986
Vaisakha 8, 1908 (*Saka*)

K. RAMAMURTHY,
Chairman,
Committee on Public Undertakings.

APPENDIX

STATEMENT OF CONCLUSIONS/RECOMMENDATIONS OF THE COMMITTEE ON PUBLIC UNDERTAKINGS CONTAINED IN THE REPORT

Sl. No.	Reference to Paragraph No. in the Report	Conclusions/recommendations
1	2	3
1	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

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		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).
2	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.

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3	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.
4	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

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		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.
5	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. 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 delay 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

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		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.
6	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.
7	3.16 and 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 and justification based on rough demand forecaste. 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 submiting well-conceived proposals of their projects for

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		approval to the Board/Government highlighting the essential features of the project as per BPE guidelines. In order to avoid time and cost overruns and to enable the Board of Directors/Government to appreciate, consider and approve the project proposals in true perspective, the Committee recommend that the Ministry should issue necessary 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.
8	3.18 and 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, Semi-conductor, 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 was 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 appraisal 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

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		Committee that the quarterly financial statement is now being mailed to 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 noticed. The Committee would like to be apprised of the action taken by the Company/Ministry in this regard.
9	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.

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10	3.23 and 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.
11	3.62 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 per cent) 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 bevond 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 per cent 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

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		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 therefor 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 specific 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 specifically 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 items 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 pheno-

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menon as the capacity created for the manufacture of a particular defence item, remained under-utilised 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 certion items of equipment underdeveloped at Bangalore Unit, viz. UHF Radio Relay (LUC 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 31st

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March 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 31st 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 started 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,

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		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".
12	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 and 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.
13	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 re-

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		maining three items, the production commenced only in 1978. During evidence, the representatives 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."
	3.69	The Committee are of the view that had the fully developed items been transferred from Bangalore to Ghaziabad Unit, machines 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.
14	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.

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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 has 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 lackadaiscal 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 field 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

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		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.
15	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 Undertakings 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.
16	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 especialy 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

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		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 atleast 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.
17	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

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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 July 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 the 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 under utilisation of built up capacity by the Company and six other private firms licensed by the DOE, the gap between the indigenous production and demand which rose from 0.27 lakh tubes in 1975 to Rs. 1.86 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.

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		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 therefore has to be fixed both in BEL as well as in the 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 are 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.
18	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, con-

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		sider that these were not such matters as could not have been surmounted by the Management with proper perspective and firm resolution.
19	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 full commissioning of Taloja Plant located near Greater Bombay. The Committee desire that the Govt./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.
20	3.147 to 3.150	The Committee note that the proposal to undertake the manufacture of Integrated Circuits (ICs) for production of 1 million ICs at a cost of Rs. 65 lakhs was approved by the Broad 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.

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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 additon, 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 catelogue.

According to the Department of Defence Production and supplies 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 obsolescence 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

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		industrial furnitures and contingencies exceeded the revised estimates of September, 1971 by about 52.8 per cent and 235.5 per cent respectively (the expenditure increased 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 approval of the Board.
21	3.15i	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 indicates 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.

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22	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 acounted 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.
23	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 es-

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		tablishing 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 of this IC Project by the Company was ill-conceived as the demand potential in India was too limited to ensure a competitve cost of production. Even advanced countries like UK & France have not set up their own facilites for manufacture of ICs though they are far more advanced than India in the field of electronics.
24	3.155	Another Public Sector agency viz. Semi-Conductor Complex has also been reported to have 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 Semi-Conductor Complex, Chandigarh or to some of the universities or IITs and devote the resources of BEL in some other fields.
25	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.

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26	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 Japan and other foreign countries but at that time they were not prepared to part with it and the Collaboration Agreement in the circumstancse 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 colalboration 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 single 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.
27	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

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		and ITI, the two major professional manufacturers who were then told of the range of ICs being manufactured by BEL. The ECIL & ITI accordingly indicated their quantity and the time frame which formed the basis for acquiring designs know-how from the RCA. The development plant 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 the new and the latest IC technologies from some other sources in USA or Japan to meet effectively the present and future requirements of country.
28	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 availed 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 Committee, therefore, recommend that the whole issue as to how the Collaboration Agreement with RCA was originally

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		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.
29	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 the 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.
30	3.163 and 3.169	As regards excess expenditure incurred on air-conditioning and industrial furniture, the Commitee 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

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		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 the BEL has also admitted that "it has been an estimating error." The Committee trust that such matters will be taken care of in future and similar situations 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.
31	3.165 and 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

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		ramifications including losses suffered and extremely limited contribution to in-house production. During evidence, the Secretary, Defence Production & Supplies 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 a 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 the basis of which Government should formulate a clear cut national policy for guidance of all concerned.
32	3.181 to 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 de-

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		ferment 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.

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