



**REPORT OF THE
COMPTROLLER AND AUDITOR GENERAL
OF INDIA**

**UNION GOVERNMENT
No. 14 (COMMERCIAL) OF 1992**

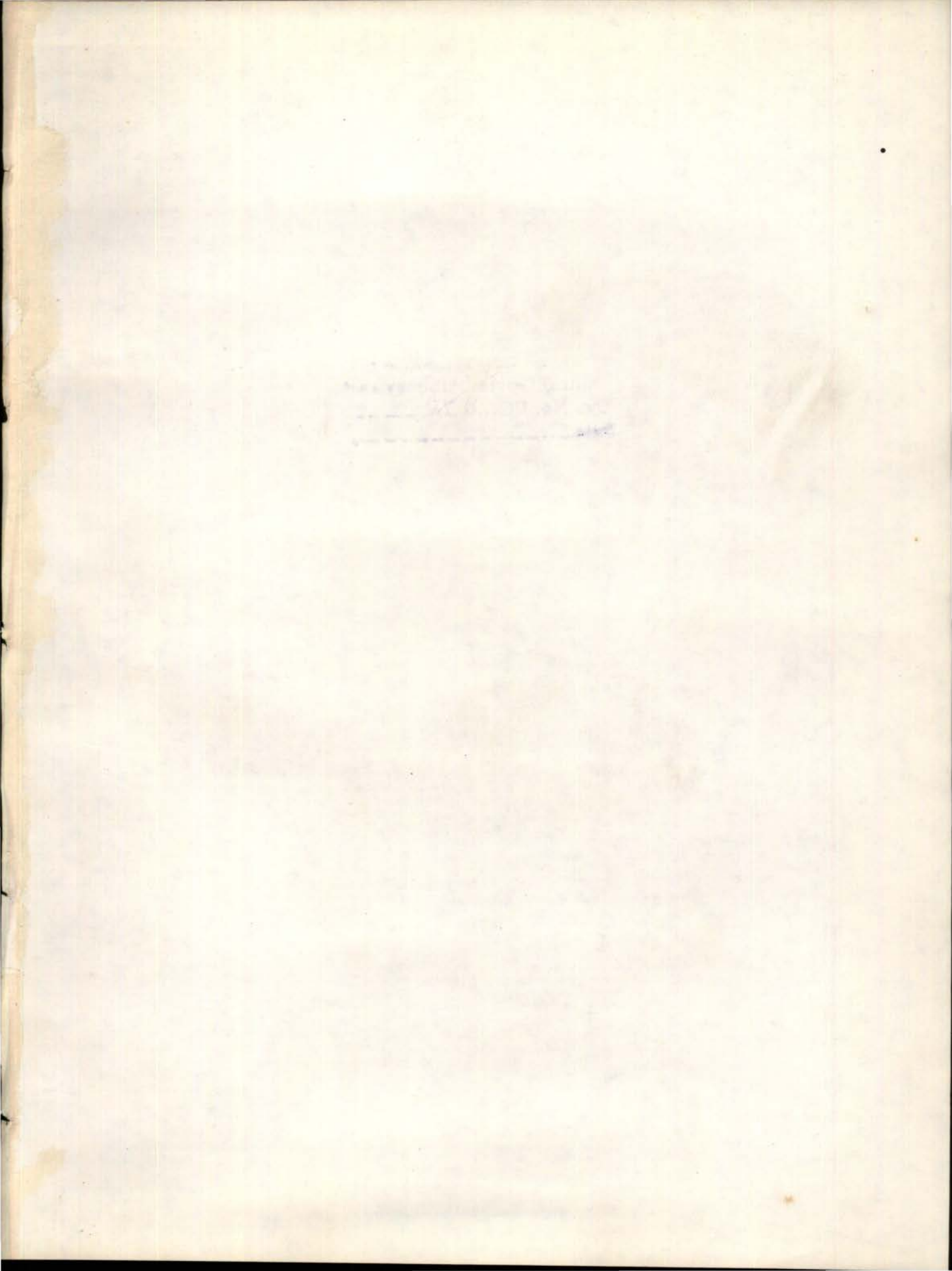
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CENTRAL ELECTRONICS LIMITED



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PREFACE

Audit Boards are set up under the supervision and control of the Comptroller and Auditor General of India (CAG) to undertake comprehensive appraisal of the performance of the Companies and Corporations subject to audit by CAG.

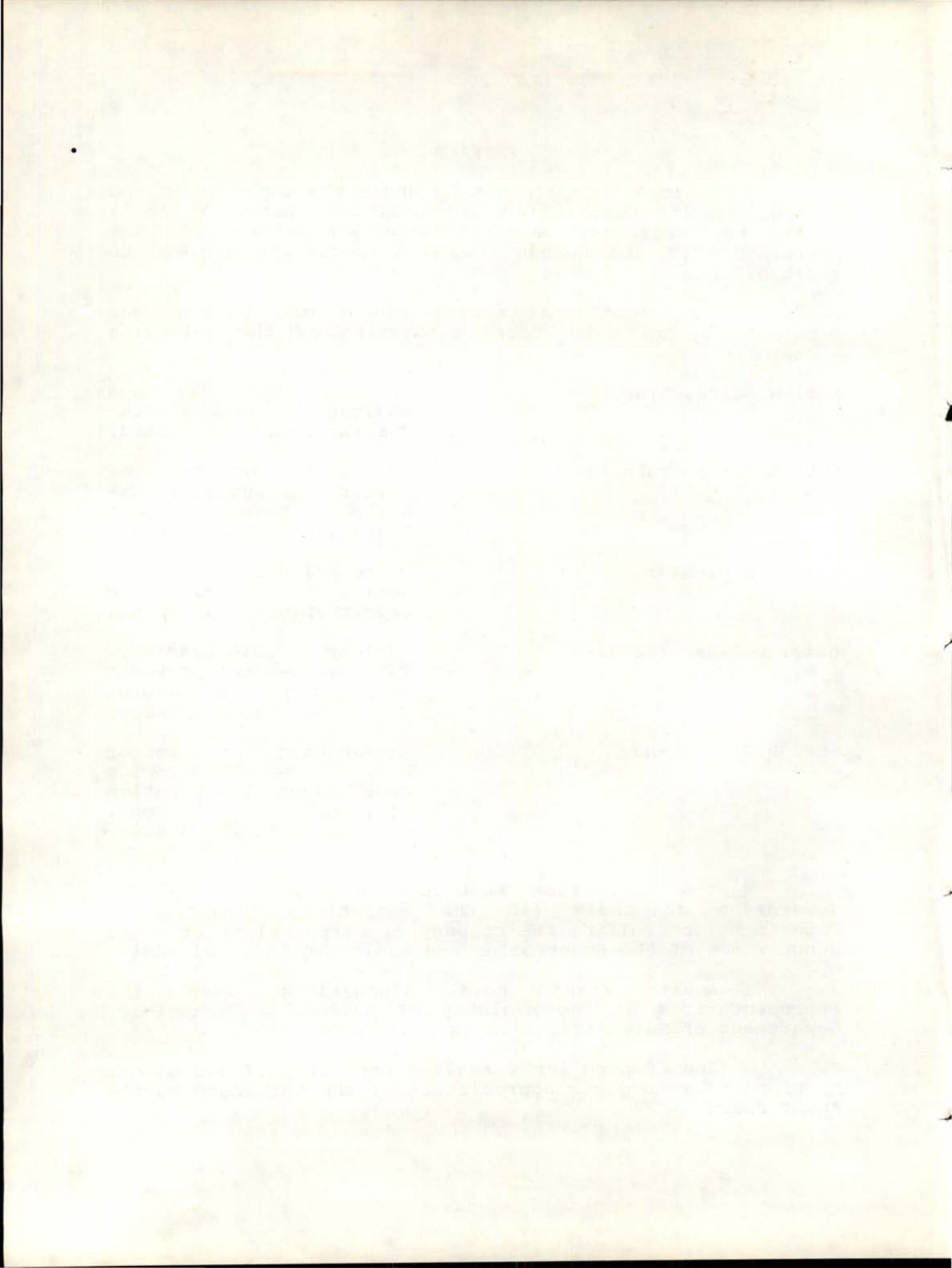
2. The report on Central Electronics Limited was finalised by an Audit Board consisting of the following members :-

Shri N. Sivasubramanian	Deputy Comptroller and Auditor General-cum-Chairman, Audit Board.
Shri A.K. Chakrabarti	Principal Director of Commercial Audit & Ex-Officio Member, Audit Board-II, New Delhi.
Shri T.N. Thakur	Principal Director of Audit, Scientific Departments, New Delhi.
Brig. P.Madan (Retd.)	Advisor (Electronics), Tata Hydro-Electric Power Supply Company, Bangalore. - Part time member.
Shri B.D. Khurana	Ex-Managing Director, M.P. State Electronics Development Corporation Limited, Bhopal. - Part time member.

The part time members are appointed by the Government of India (in the respective Ministry or Department controlling the company or corporation) with the concurrence of the Comptroller and Auditor General of India.

3. Audit Board held discussions with the representatives of the Ministry of Science & Technology, Department of Scientific & Industrial Research.

4. The Comptroller & Auditor General of India wishes to place on record his appreciation of the work done by the Audit Board.



OVERVIEW

1. INTRODUCTION

Central Electronics Limited was formed in 1974 for utilising technology available in National Physical Laboratory for commercial production of electronic components and systems. Its objectives are to carry on business using know-how generated in National Physical Laboratory and other National Laboratories and R&D Institutions.

(Paras 1 & 2.1)

2. FINANCIAL PERFORMANCE

The paid-up capital of the Company as on 31st March, 1992 was Rs.18.88 crores and loans from Government stood at Rs.16.31 crores on same date including Rs.2.10 crores of interest due which was earlier converted into loan in 1987. The accumulated loss incurred by the Company upto 31st March, 1992 was Rs.16.95 crores which has almost fully eroded paid-up capital of Rs.18.88 crores. Increase in expenditure on salaries, wages, etc. and decline in production from Rs.22.37 crores in 1989-90 to Rs.18.79 crores in 1990-91 due to drop in sales, added to the losses. Interest due amounting to Rs.4.56 crores for the years 1990-91 & 1991-92 was also converted by Government into fresh loan with effect from 1st April, 1992, which has avoided referring the Company to BIFR.

(Paras 4.1, 4.2, 4.3 & 6.1))

3. PROJECTS

Between March, 1984 and March, 1992 the Company received funds aggregating Rs.27.91 crores from Government for implementation of 7 projects against which it could utilise only Rs.12.05 crores on 6 projects upto March, 1992.

The funds amounting to Rs.4.96 crores received by the Company from Government during 1989-90 to 1991-92 for expansion in production of Professional Ferrites were diverted for other purposes without approval of Government

as the Company had not implemented the project due to entry of private manufacturers in this field.

Out of Rs.9.40 crores received from Government for expansion of Solar Photovoltaics Project (from 1 MW to 5 MW capacity) from 1983-84 to 1989-90 the Company utilised Rs.6.31 crores upto 1991-92 for augmenting its capacity to 2 MW and on procurement of certain additional equipment not envisaged in original project cost. The balance amount of Rs.3.09 crores was diverted to other needs without taking approval of Government. The Government has also not asked for refund of Rs.3.09 crores though it is represented on the Board of the Company and is aware of funds being used for purposes other than expansion project.

During 1986-87 to 1991-92 the Company received Rs.4.76 crores from Government for implementing a project for production of 4.5 million transducer plates. Even after incurring Rs.2.82 crores on the project upto March,1992, there has been no commercial production. The viability of project estimates of the Company and the quality of monitoring in the Department requires review.

(Paras 5(i), (ii), (iii) & (iv))

4. PRODUCTION AND R & D

Production of Solar Photovoltaic cells accounts for 70 per cent of the Company's turnover but margin of profit is not high in the product. If the company is to become viable in future, it will have to achieve significantly higher levels of production and sales in higher profit making items and reduce substantially manpower within a short span of time. Interest relief through conversion of the amount of interest due upto 31st March,1992 into loan may not help in the long run.

The capacity utilisation was very low during the last seven years upto 1991-92. The main reasons for low capacity utilisation were poor quality of zero air, oxygen and nitrogen, stock outs, insufficient orders, varying product mix and non-availability of raw materials.

The rejections were not reduced to bring Company at par with international standards.

Out of 207 machines engaged in production, time totalisers were installed on 26 high value machines of which the utilisation of 24 of high value machines was near about half only during the last five years upto 1991-92.

144 employees were inducted from 1985-86 to 1991-92, though capacity utilisation had all along been very low. In Consumer Electronics Division although the production went down, no review of manpower requirement was done. The Company was still to identify the surplus manpower with it.

As on 31st March, 1992 the amount of unspent grants-in-aid for R&D projects lying with Central Electronics Limited was Rs.7.43 crores of which Rs.1.40 crores were kept in the bank and the balance amount of Rs.6.03 crores was diverted for purposes other than R&D; clearly the R&D projects grants were being used to finance the accumulating losses arising from production and sales.

By and large the R&D projects are not showing any promise of adding to the commercial viability of the Company which is likely to remain a collection of pilot plants suited to R&D efforts and not to assessed market demands and market prices.

(Paras 6.1(i), 6.2(ii), 6.3, 6.4, 6.5(ii)&(iii) and 6.6(iii)&(viii))

5. MARKETING

The Company had not formulated any refined or competitive pricing policy for products manufactured or assembled by it. It had also not used its marketing division to create markets for its products at viable prices. The Company is heavily dependent on orders from Government. It needs to review its strategy to be able to stand competition from within India and from abroad, with likely levels of tariff protection and without demanding 'cost plus' basis for sale pricing.

(Paras 7.4(i) & (ii) and 7.6)

CHAPTER I

INTRODUCTION

1.1 In order to utilise technology available in National Physical Laboratory (NPL) for commercial production of electronic components and systems, a decision was taken by Government of India to set up Central Electronics Limited (CEL) as a public sector undertaking in January, 1973 with capital outlay of Rs.1.81 crores. CEL was incorporated on 26th June, 1974 and placed under the administrative control of Department of Science & Technology. Its Registered Office is in the Union Territory of Delhi and its works are at Sahibabad (in Ghaziabad U.P.).

1.2 The Company is manufacturing and assembling products in three ranges viz. Professional or Industrial grade, Defence goods and Consumer goods. The details of major products and competitors for them are given below:

S.No.	Product range	Product	Competitor
A.	Professional/ Industrial	1.Ferrite components	Hilversome Electronics, Madras, Cosmo Ferrites, H.P., Morris Electronics, Pune, WEBEL, Calcutta, and Indo Maxwel, Cuttak.
		2.PZT Products	Imports from far East & Europe.
		3.Solar Photovoltaics Systems	BHEL, Gurgaon, REIL, Jaipur, Tata BP solar, Bangalore, Udav Semiconductors, Coimbatore.
		4.Axle Counters	DCM Ltd., Delhi, Crompton Greaves, New Delhi and Byculla & Podainur Works of Indian Railways, Bombay.
B.	Defence Goods	1.Phase Shifters	No Competitor.
		2.Special types of light weight, foldable, man-pack solar photovoltaic modules for high altitude application.	No Competitor
C.	Consumer Goods	1.Projection Television	Hotline, Delhi, Entel, Bombay, Videocon, Delhi, etc.

CHAPTER II

OBJECTIVES

2.1 The main objectives of the Company are:

a) to manufacture electronic components commercially using know-how generated in the NPL and other national laboratories and R&D institutions;

b) to carry on business relating to research, development, pilot production, manufacturing, assembly, repairing, overhauling, maintaining and buying, selling, importing, exchanging, hiring of apparatus, equipment, instruments, components and materials.

2.2 The Company framed micro objectives in its 10 year perspective plan prepared in March, 1982. They were reformulated in 1985 as given below:

- Improvement in cost effectiveness of Company's products;

- Utilisation of the assets and energies of the Company to maximize profits;

- Sub-contracting and ancilliaryization of low technology activities;

- Generation of internal resources;

- Increase in the value addition.

The Ministry stated (December, 1992) that the objective of the Company was redefined in 1985-86 as under:

"To achieve excellence in the technology, manufacture and marketing of renewable energy systems and selected electronic materials, components and systems."

The Ministry further stated that from the point of view of commercial viability it was decided to confine the Company's product mix to only three product groups viz. Solar Photovoltaic Cells, Modules and Systems; Industrial and Railway Electronics Equipment/Systems and professional Ferrites, Ferrite Components and Piezo Ceramic Components.

CHAPTER III

ORGANISATION

3. The Management of the Company is vested in a Board of Directors under a Chairman & Managing Director. The other Directors are part-time Directors nominated by the Department of Scientific & Industrial Research. There are no full time functional Directors other than Chairman & Managing Director.

CHAPTER IV

CAPITAL STRUCTURE

4.1 The Company was incorporated with an authorised capital of Rs.5 crores. The authorised capital was increased and stood at Rs.30 crores as on 31st March,1992. The paid-up capital of the Company on same date was Rs.18.88 crores all subscribed by the Government of India. The accumulated losses of Rs.16.95 crores on that date had eroded the paid-up capital to that extent.

4.2 Loans from Government of India to the Company on 31st March,1992 stood at Rs.16.31 crores, which included a sum of Rs.2.10 crores of interest due, converted to loan in 1987.

4.3 The Government of India decided to restructure the Capital of the Company in March,1992 by converting interest due on the loans for the years 1990-91 to 1993-94 into additional loans. Consequently, interest amounting to Rs.4.56 crores for the years 1990-91 and 1991-92 was converted into a loan w.e.f. 1st April,1992, which has avoided referring the Company to BIFR.

CHAPTER V

DEVELOPMENT & PROJECTS

i) Between March, 1984 and March, 1991 Government of India sanctioned 7 projects with capital outlay of Rs.28.06 crores. Funds aggregating Rs.27.91 crores were released by the Government of India to the Company upto end of March, 1992. The Company incurred expenditure of Rs.12.05 crores on 6 projects and was left with unspent balance of Rs.15.86 crores as given below:

Sl.No.	Name of Project	Date of sanction	Capital outlay (Rs. in crores)	Amount received upto 31.3.92 by Company (Rs. in crores)	Expenditure upto 31.3.92 (Rs. in crores)	Status
1.	PFD Expansion(Phase-I)	24.5.84	1.60	1.60	1.60	Completed
2.	5 MW Solar Photovoltaic Project	26.3.84	9.40	9.40	6.31	Funds were utilised on increasing the capacity of existing plant of 1 MW to 2 MW capacity.
3.	PTV	3.3.84	2.60	2.58	0.53	Completed
4.	C.DOT Exchange	30.3.88	1.00	1.00	0.51	Completed
5.	PZT	31.7.86 (Revised in Feb., 1991)	4.88	4.76	2.82	On going
6.	PFD Expansion (Phase-II)	19.1.90	4.96	4.96	NIL	Not taken up
7.	Modernisation of SPV	21.3.91	<u>3.62</u>	<u>3.61</u>	<u>0.28</u>	On going
Total:			<u>28.06</u>	<u>27.91</u>	<u>12.05</u>	

ii) PFD Expansion (Phase-II): Expansion in production of Ferrites from 200 to 350 tonnes per annum was projected in December, 1989 at a cost of Rs.4.96 crores. The Government approved the project in January, 1990 and released Rs.4.96 crores (50 per cent equity and 50 per cent loan) from 1989-90 to 1991-92. The Company had not implemented the project.

The Management stated (July, 1992) that because private manufacturers had entered the ferrites market for T.Vs., Company decided to concentrate on communication ferrites e.g. pot cores. The Company diverted the funds to other purposes without approval of Government. The Government has not asked the Company to refund the amount though it was aware of the developments as its representatives are serving on the Board of the Company.

The Ministry stated (December, 1992), that the plan funds which remaining unutilised with the Company were utilised to meet working capital needs of the Company. The Ministry added (December, 1992) that the Government would regularise the diversion of funds by issue of suitable sanction. No sanction letter has been issued so far.

iii) 5 MW solar Photovoltaic Project: The Company's Solar Photovoltaic (SPV) Plant of 1 MW capacity was set up under NASPED Programme completed in 1985. The Company prepared a project for expansion of SPV production from 1 MW to 5 MW. The Government approved the project in March, 1984 and released Rs.9.40 crores (50 per cent equity and 50 per cent loan) from 1983-84 to 1989-90. DGTD ruled (February, 1987) that the Company was not utilising its existing capacity fully. The Company incurred expenditure of Rs.6.31 crores upto 1991-92 for augmenting its capacity to 2 MW and on procurement of additional equipment not envisaged in the original project cost. Balance funds of Rs.3.09 crores were diverted by the Company to other needs without the approval of Government.

The Company constructed a double storey building with 2216 Sq. metres of area in 1985-88 at a cost of Rs.0.35 crore which is lying unused.

The Management stated (December,1991) that plans to modernise and expand the capacity of SPV Plant and for producing Ultra High Efficiency solar Cells required the new building. The Management also held(July,1992) that the expenditure had resulted in improvement in production in existing plant.

The Company had achieved production of 0.93 MW per annum only till March, 1992 against the capacity of 2 MW. Government has not asked for refund of Rs.3.09 crores though it is aware of the funds being used for purposes other than the expansion project.

The Ministry stated (December,1992) that the market for SPV products did not grow as rapidly as expected in 1983 and the capacity of the plant was restricted to 2 MW per year. The Ministry added that anticipating increase in demand for SPV for water pumps for irrigation the Company was planning to upgrade and expand the capacity from 2 MW to 4 MW. A new plant for 1 MW based on a new technology to produce Ultra High Efficiency Solar Cells was being planned. The reply is silent on past diversion of funds to purposes other than the project.

iv) Transducer PZT: The Transducer PZT (Peizeoelectric) is the element for converting audio input into electrical signals and vice-versa in the telephone instrument. The Company was manufacturing PZT elements for defence applications and transducer plates in its Electronic Ceramic Division. But it decided to go in foreign technical collaboration and a project was approved by Government in July,1986 for production of 4.5 million transducer plates (3 million in the first phase and 4.5 million units in the

second phase). A captive market was visualised within the country. Profit margin of Rs.0.51 crore on production of 4.5 million units was envisaged. The project cost was revised to Rs.4.88 crores in February,1991.

Rs.4.76 crores (equity: Rs.2.38 crores and loan: Rs.2.38 crores) were received from 1986-87 to 1991-92 by Company from Government and expenditure of Rs.2.82 crores was incurred (including technical know-how fees of Rs.0.31 crore paid to foreign collaborator) upto 31st March,1992.

The Company imported equipment costing Rs.0.86 crore in July,1990 which was installed and commissioned in May,1991. In 1991-92, Company imported 10,000 Piezo discs at a cost of Rs.0.02 crore and produced 6000 Nos. of transducer plates. There was no further production on the ground that it was not economically viable. The Company imported in May,1992 more equipment (value: Rs.1.50 crores) for manufacture of peizo ceramic disc. The equipment suffered substantial damages during transit and is still to be repaired (December, 1992).

The Management stated(July,1992) that the Company incurred losses from 1988-89 to 1990-91 and Rs.2.80 crores and more of funds were required for completing the project. Efforts were on to renegotiate the agreement with foreign collaborator. The Ministry added (December,1992) that the project had a potential to be viable if in the next 2 to 3 years 4 to 5 million PZT discs are produced using indigenous raw materials. The PZT transducers were originally to be produced for Electronic Push Button Telephones (EPBT). Subsequently, DOT went in for cheaper electro dynamic (non Piezo type) capsules. The PZT elements for Ringers from Japan, Singapore and Hong Kong were cheaper.

Thus, after incurring expenditure of Rs.2.82 crores on the project, in the Company no commercial

production or a viable project seems likely in the near future. The Ministry stated (December, 1992) that PZT Transducer Project is expected to be within the revised cost of Rs.4.88 crores for manufacture of only 3 million transducer plates per annum.

CHAPTER VI

PERFORMANCE

6.1 Financial Performance:

i) The financial performance of the Company in recent years is given below:

	(Rs. in lakhs)						
	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92
LIABILITIES:							
a) Paid-up capital	985.00	1185.00	1185.00	1365.00	1565.00	1795.00	1887.67
b) Reserves & Surplus	-	-	-	-	-	-	-
c) Borrowings:							
i) From Govt. of India	586.27	896.27	1272.93	1275.47	1422.93	1568.47	1630.68
ii) From Public bodies	7.00	6.68	6.59	6.59	6.59	6.41	156.41
iii) From Banks	-	268.64	310.47	415.54	624.69	849.70	745.11
d) Trade dues and other liabilities including provisions	<u>882.04</u>	<u>976.59</u>	<u>957.00</u>	<u>1176.29</u>	<u>1268.75</u>	<u>2071.85</u>	<u>2670.27</u>
TOTAL:	<u>2460.31</u>	<u>3333.18</u>	<u>3731.99</u>	<u>4238.89</u>	<u>4887.96</u>	<u>6291.43</u>	<u>7090.14</u>
ASSETS:							
e) Gross Block	614.37	810.04	931.81	935.02	1047.73	1085.08	1284.55
Less: Depreciation	335.82	399.28	443.92	490.17	546.65	602.74	660.83
f) Net Block	278.55	410.76	487.89	444.85	501.08	482.34	623.72
g) Capital work-in-progress	239.57	113.83	61.00	97.49	97.85	402.48	364.71
h) Current assets, loans and advances	1549.18	2341.35	2744.44	2826.01	3060.04	3453.72	4329.40
i) Deferred Revenue expenditure	3.15	84.91	60.88	39.93	23.34	2.76	77.01
j) Accumulated losses	<u>389.86</u>	<u>382.33</u>	<u>377.78</u>	<u>830.61</u>	<u>1205.65</u>	<u>1950.13</u>	<u>1695.30</u>
TOTAL:	<u>2460.31</u>	<u>3333.18</u>	<u>3731.99</u>	<u>4238.89</u>	<u>4887.96</u>	<u>6291.43</u>	<u>7090.14</u>
k) Capital employed(f+h-d)	945.69	1775.52	2275.33	2094.57	2292.37	1864.21	2282.85
l) Net worth(a+b-i-j)	591.99	717.76	746.34	494.46	336.01	-157.89	115.36
INCOME:							
1. Sales	501.98	1240.44	1708.63	1665.20	2076.81	1496.16	3821.11
2. Departmental transfers	58.73	70.92	66.40	74.25	111.64	63.98	155.54
3. Total sales	560.71	1311.36	1775.03	1739.45	2188.45	1560.14	3976.65
4. Interest received	10.80	2.97	2.78	2.54	1.64	1.41	6.92
5. Other income	<u>14.71</u>	<u>5.82</u>	<u>8.64</u>	<u>13.37</u>	<u>25.37</u>	<u>18.39</u>	<u>39.63</u>
6. Total income	<u>586.22</u>	<u>1320.15</u>	<u>1786.45</u>	<u>1755.36</u>	<u>2215.46</u>	<u>1579.94</u>	<u>4023.20</u>

EXPENDITURE

7. Salaries, wages & other benefits to employees	152.77	212.23	266.26	370.14	454.54	665.37	596.97
8. Manufacturing Expenses	567.74	1014.89	1410.12	1342.96	1614.93	1326.59	2667.79
9. Admn. & Selling & other Expenses	41.22	60.01	102.65	241.99	194.48	190.94	120.51
10. Interest paid	73.74	94.72	151.41	198.02	269.90	342.75	190.15
11. Excise duty	21.26	30.03	52.95	63.45	49.55	59.89	107.18
12. Depreciation	<u>46.61</u>	<u>64.66</u>	<u>45.02</u>	<u>52.30</u>	<u>55.62</u>	<u>57.95</u>	<u>61.32</u>
13. Total Expenditure	<u>903.34</u>	<u>1476.54</u>	<u>2028.41</u>	<u>2268.86</u>	<u>2639.02</u>	<u>2643.49</u>	<u>3743.92</u>
14. Profit(+)/Loss(-) in the year	+16.96	+7.53	+4.55	-452.83	-375.04	-744.48	+254.83

PERCENTAGE OF:

15. Salaries, etc. to total income	26.06	16.08	14.90	21.09	20.52	42.11	14.84
16. Profit to total income	2.89	0.57	0.26	-	-	-	6.33
17. Profit to capital employed	1.79	0.42	0.20	-	-	-	11.16

The profit of Rs.2.55 crores for the year 1991-92 did not allow for a provision for payment of interest amounting to Rs.2.24 crores on Government loans. As the above amount of interest is an accrued liability of the Company its non-provision has resulted in overstatement of profit to the same extent. After taking into account the interest liability the correct profit works out to Rs.0.31 crore.

The losses incurred by the Company upto 1990-91 had been mounting and accumulated losses have eroded the paid-up capital (Rs.18.88 crores) to the extent of Rs.16.95 crores upto 1991-92. One of the reasons for increase in losses upto 1990-91 is the disproportionate increase in the expenditure on salaries, wages etc. though production declined from Rs.2236.98 lakhs in 1989-90 to Rs.1879.20 lakhs in 1990-91 mainly due to drop in sales.

The Ministry stated (December, 1992) that the following steps had been taken to reduce the losses and improve the profitability of the Company:

(a) Controllable and non-controllable costs have been identified and actions initiated to reduce the former.

(b) Government have agreed to convert the interest on Government loans falling due during 1990-91 to 1993-94 into fresh loan resulting in reduction in cash out flow during these years.

(c) The manpower employed by the Company has been restricted to 950 in the past 2 years.

(d) Capacity utilisation of SPV plant has increased from 0.67 MW in 1990-91 to 0.93 MW in 1991-92.

(e) Orders for Railway Electronic products such as Axle counters, Block Equipments have increased.

(f) Production of Microwave Ferrite Phase Shifter to meet demands from Defence.

The Ministry added that the Company achieved profit in 1991-92 and this trend was expected to continue in the coming years. However, the financial performance report for the month ending December, 1992 of the Company (sent to the Department of Public Enterprises) indicated that against budgetted profit of Rs.2.62 crores (for 9 months ending December, 1992), the Company suffered a loss of Rs.1.85 crores. Sales upto the end of December, 1992 were Rs.20.27 crores as against the estimate of Rs.31.09 crores.

The Ministry also stated (December, 1992) that the Company was likely to get Rs.21 crores from the Government (half as equity and half as loan) during the 8th Plan period mainly for modernisation and expansion of the existing SPV plant, setting up a new cell plant to make Ultra High Efficiency Solar cells and for setting up the High Permeability Ferrite Plant. Solar photovoltaic cell constitute 70 per cent of the Company's turnover where

profit margin is only 6 to 8 per cent. The Company will, therefore, have to achieve significantly higher levels of production and sales than those projected in the above areas of higher profit margins. It will have to reduce substantially the surplus manpower within a very short span of time. It will also need to get interest relief by conversion of interest due upto 31st March, 1992 into equity (and not fresh loan) if the Company is to become viable in future.

ii) The profit or loss made by the different units of the Company are given below:

Name of Unit	Profit(+)/Loss(-) (Rs. in lakhs)						
	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92 (Prov.)
1. Solar Photovoltaics	+41.42	+94.72	+134.76	-133.74	-56.85	-314.72	+359.00
2. Professional Ferrites	-25.65	-7.94	-14.67	-53.70	-137.30	-115.35	+5.00
3. Instruments & systems	+1.39	-2.70	-33.71	-148.27	-83.26	-165.20	-10.00
4. Consumer Electronics	-7.14	-44.51	-53.26	-72.78	-62.09	-78.16	-51.00
5. Electron Tubes	-7.55	-13.20	-16.87	-13.05	-30.61	-42.70	-34.00
6. Electronics Ceramics	-8.66	-8.47	-19.22	-47.20	-21.77	-38.97	-17.00
7. Power Electronics	+5.28	-19.16	-	-	-	-	-
8. Sub-total	-0.91	-1.26	-2.97	-468.74	-391.88	-755.10	+252.00
9. Misc. income	17.87	8.79	7.52	15.91	16.84	10.62	-
10. Total Profit(+)/Loss(-)	+16.96	+7.53	+4.55	-452.83	-375.04	-744.48	+252.00

The losing activities were Solar Photovoltaics (from 1988-89 to 1990-91) and Professional Ferrites (till 1990-91), Instruments and Systems, Consumer Electronics, Electron Tubes and Electronics Ceramics. The Management attributed the following reasons for the losses:

- i) Solar Photovoltaics Inadequate demand and low prices received for the product.
- ii) Professional Ferrites Product catered only to limited range and there was poor demand.

iii) Instruments & Systems Price was not competitive in relation to those of others in India due to surplus manpower and demand was poor.

iv) Consumer Electronics Demand was poor and product failed.

iii) Estimates & Actuals: Vis-a-vis the estimates of income etc. the achievements fell short year after year indicating failure of control over planning, direction and achievement. The estimates and performance are given below:-

(Rs. in lakhs)

Items	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92
1. Total income							
-estimates	1110.00	1140.00	1778.00	2408.00	2811.00	2763.00	3700.00
-actuals	586.22	1320.15	1786.45	1755.36	2215.46	1579.94	4023.20
2. Raw Materials, etc.							
-estimates	605.30	1070.85	1331.10	1727.10	1858.10	1783.60	2224.80
-actuals	549.19	1035.05	1364.17	1275.97	1518.13	1229.83	2394.87
3. Depreciation							
-estimates	65.33	87.00	81.50	50.72	60.50	62.65	76.00
-actuals	46.61	64.66	45.02	52.30	55.62	57.95	61.32
4. Salaries, etc.							
-estimates	167.68	209.05	265.85	333.60	424.90	593.85	649.00
-actuals	152.77	212.23	266.26	370.14	454.54	665.37	596.97

The Ministry stated (December, 1992) that the Company's main customers were Government Departments and public sector companies. Orders from them depended on funds allowed to them in their budget. As a result Company received orders in the last quarter of the year for execution in the same financial year. This created problems for the Company. The reply is not wholly tenable as commercial activity by competitors also takes place only in such a scenario as has been presented.

iv) Financial Control System: Following deficiencies were noticed in financial control:

- a) Prior approval of the Board of Directors in respect of purchase cases exceeding Rs.25 lakhs (Rs.15 lakhs prior to June,1989) was not obtained and the list of cases put up to the Board for their ex-post facto approval did not apprise the Board as to how and under what circumstances purchase decisions were taken.
- b) The internal audit control was not commensurate with the size and activities of the Company.

6.2 Capacity Utilisation

i) The capacity for production of major products and actual production in recent years are given below:

Sl. No.	Particulars of product	Year	Rated capacity	Actual production	Percentage of capacity utilisation
1.	Professional Ferrites (in tonnes)	1985-86	160	43.00	26.88
		1986-87	160	60.43	37.77
		1987-88	160	99.20	62.00
		1988-89	160	63.57	39.73
		1989-90	160	40.60	25.38
		1990-91	160	40.72	25.45
		1991-92	160	37.32	23.33
2.	High Alumina Components (in tonnes)	1985-86	4	0.60	0.15
		1986-87	4	0.20	5.00
		1987-88	4	0.20	5.00
		1988-89	4	0.11	2.75
		1989-90	4	0.64	16.00
		1990-91	4	0.87	21.72
		1991-92	4	1.65	41.25
3.	Piezoelectric Elements (in Lakhs in Nos.)	1985-86	5	0.11	2.20
		1986-87	5	0.10	2.00
		1987-88	5	0.57	11.40
		1988-89	5	0.53	10.60
		1989-90	5	0.62	12.40
		1990-91	5	0.35	7.00
		1991-92	5	0.90	18.00
4.	Microwave Modules (In Nos.)	1987-88	1500	856	57.07
		1988-89	1500	784	52.27
		1989-90	1500	325	21.66
		1990-91	1500	360	24.00
		1991-92	1500	843	56.20
5.	Projectors (In Nos.)	1985-86	1000	48	4.80
		1986-87	1000	12	1.20
		1987-88	1000	-	-
		1988-89	1000	-	-
		1989-90	1000	-	-
		1990-91	1000	-	-
		1991-92	-	-	-
6.	Monochrometers (In Nos.)	1985-86	5	-	-
		1986-87	5	5	100
		1987-88	5	4	80
		1988-89	5	-	-
		1989-90	5	1	20
		1990-91	5	2	40

		1991-92	5	4	80
7.	Axle Counters (In Nos.)	1985-86	250	110	46
		1986-87	250	115	46
		1987-88	250	105	42
		1988-89	250	30	12
		1989-90	250	19	7.60
		1990-91	250	103	41.20
		1991-92	250	197	78.80
8.	PABX/PAX (In Nos.)	1985-86	100	25	25
		1986-87	100	15	15
		1987-88	100	27	27
		1988-89	100	-	-
		1989-90	100	-	-
		1990-91	100	-	-
		1991-92	100	-	-
9.	Projection Television (In Nos.)	1986-87	1000	24	2.4
		1987-88	1000	174	17.4
		1988-89	1000	171	17.1
		1989-90	1000	77	7.7
		1990-91	1000	21	2.1
		1991-92	1000	44	4.4
10.	Colour Television (IN Nos.)	1985-86	3000	473	15.76
		1986-87	5000	524	10.48
		1987-88	5000	145	2.90
		1988-89	5000	70	1.40
		1989-90	5000	71	1.42
		1990-91	5000	26	0.52
		1991-92	5000	2	0.04
11.	Solar Cells & Light Servicing devices (In kilo watts)	1985-86	1350	143.85	10.60
		1986-87	1350	647.83	48.00
		1987-88	1350	776.00	57.50
		1988-89	1350	849.04	62.90
		1989-90	1350	661.14	49.00
		1990-91	1350	672.40	49.80
		1991-92	1350	930.03	68.89
12.	Solar PV Modules (In kilo watts)	1985-86	1000	112.61	11.26
		1986-87	1000	503.93	50.39
		1987-88	1000	488.00	48.80
		1988-89	1000	626.70	62.67
		1989-90	1000	700.86	70.09
		1990-91	1000	450.61	45.06
		1991-92	1000	850.95	85.10

Note: The rated capacity of Solar Cells has been worked out on the basis of two shifts working.

ii) The capacity utilisation had been very low for all products. The Management stated (December,1991) that capacity utilisation in respect of professional ferrites needs to be evaluated on weighted average of different types of cores. The Management added (July,1992) that the Company had not felt it necessary to compute the installed capacity in terms of man hours.

a) In Photovoltaic Division lower capacity utilisation was attributed to power failure, poor quality of zero air, oxygen and nitrogen, stock outs, insufficient orders and non-availability of raw materials.

b) In Ferrites Division shortfall in production was attributed to processing problems due to varying product mix, trial runs and shortage of nitrogen.

c) In Instruments and Systems Division shortfall in production was attributed to non-availability of raw materials, non-receipt of clearance after field trial, non-receipt of orders, shortage of materials, change in site condition by Railways and late receipt of orders.

d) In Consumer Electronics Division shortfall in production was attributed to delay in installation of imported equipment, delay in receipt of raw material, decrease in demand, delay in finalisation of new models, non-placement of orders.

e) In Electronic Ceramics Division shortfall in production was attributed to lack of orders, delay in acceptance of samples and non-availability of raw materials.

f) In Electron Tube Division shortfall in production was attributed to lack of orders, non-receipt of components and raw materials and delays in development.

The reasons do not focus on failures in planning, management, estimation and production factors behind such reasons.

6.3 Utilisation of Machines

As on March, 1992, the Company had 207 machines engaged in production. Time totalisers were installed on 26 high value machines costing Rs.5 lakhs and above.

The utilisation of 24 of the high value machines in 2 divisions are given below:

	<u>1987-88</u>	<u>1988-89</u>	<u>1989-90</u>	<u>1990-91</u>	<u>1991-92</u>
1. Hours Available					
i) SPVG	65,085	40,139	68,351	54,076	60,734
ii) Components Group	61,029	45,168	50,075	59,926	51,800
2. Hours Utilised					
i) SPVG	30,394	22,989	27,671	28,399	27,678
ii) Components Group	31,620	18,960	18,635	26,320	27,749
3. Percentage of Utilisation					
i) SPVG	47	57	40	53	46
ii) Components Group	52	42	37	44	54

The Ministry stated (December, 1992) that the utilisation of machines (around 50 per cent) was dependent on orders.

6.4 Rejections

The rejections in the various production divisions were high.

i) Solar Photovoltaics (SPV): The percentage of rejections, yield, reprocessable rejections and reprocessing expenditure on SPV are given below:

	1988-89			1989-90			1990-91			1991-92		
	LR	HR	Total	LR	HR	Total	LR	HR	Total	LR	HR	Total
1. Percent- age of:												
a) Break- ages	13.3	8.2	13.2	13.0	7.9	12.4	8.3	8.5	8.4	6.1	7.9	6.5
b) Rejec- tions	3.4	27.0	3.6	3.9	39.4	7.9	6.1	46.2	12.5	3.2	13.9	5.6
c) Total wasteful rejections	16.7	35.2	16.8	16.9	47.3	20.3	14.4	54.7	20.9	9.3	21.8	12.1
d) Yield	83.3	64.8	83.2	83.1	52.7	79.7	85.6	45.3	79.1	90.7	78.2	87.9
2. Repro- cessable Rejec- tions (Nos.)	339841	Nil	339841	272627	Nil	272627	211644	Nil	211644	80890	94390	175280
3. Cost of reproce- ssing (Rs. in lakhs).	132.26	Nil	132.26	120.66	Nil	120.66	93.26	Nil	93.26	114.64		114.64

(LR=Low resistivity)

(HR=High resistivity)

No regular norms for acceptable level of rejections (around 20 per cent) had been fixed by the Company. The Management stated (December, 1991) that in terms of efficiencies or ratings of the cells produced the specification and rejection norms would vary.

But, the technical criteria for rejection norms do not militate against management practice of laying down norms to control yield.

The Ministry stated (December,1992) that the Company was operating its SPV manufacturing plant to achieve overall yield of 90 per cent which compared well with the prevailing international standards. The yield achievement cannot, however, be rationalised as a norm which was not fixed nor equated with international standards fixed by other managements.

The yield has often been below 90 per cent. The rejections in HR wafers went up from 35.2 per cent in 1988-89 to 54.7 per cent in 1990-91 and came down to 21.8 per cent in 1991-92. The reduction in rejections of HR wafers in 1991-92 was the result of reprocessing of HR wafers during 1991-92 which was not done in earlier years. Reasons for this action which contributed to achievement of higher yield in 1991-92 as compared to earlier years and why it was not done earlier were not given.

ii) Professional Ferrites Division: The levels of rejections in Professional Ferrites division in terms of weight are given below:

Year	Percentage of rejection to production
1986-87	11.50
1987-88	9.61
1988-89	10.90
1989-90	18.91
1990-91	17.88
1991-92	16.39

The Management stated (July,1992) that tunnel kiln imported in 1976 had outlived its life and relining the refractories had led to increase in rejections. No records on stage-wise rejections prior to kiln stage was maintained. A good part of the rejected material was reprocessed and converted into useful products but records showing quantity reprocessed had not been maintained.

In terms of number of T.V. and communication ferrites produced and rejected, the percentage of rejection between 1985-86 and 1991-92 varied from 7.64 to 18.95 and 7.05 to 22.84 respectively.

The Ministry stated (December,1992) that the rejections came down in 1991-92 to an overall average of 10 per cent (in numbers) which was considered reasonable. No international standards were given for considering 10 per cent as reasonable.

6.5 Manpower Management

i) The manpower strength and expenditure on salaries vis-a-vis value of production are given below:

	<u>1985-86</u>	<u>1986-87</u>	<u>1987-88</u>	<u>1988-89</u>	<u>1989-90</u>	<u>1990-91</u>	<u>1991-92</u>
1. Men in Position:							
a) Executives	209	210	270	271	287	296	318
b) Non-Executives	<u>597</u>	<u>632</u>	<u>599</u>	<u>611</u>	<u>652</u>	<u>654</u>	<u>632</u>
	<u>806</u>	<u>842</u>	<u>869</u>	<u>882</u>	<u>939</u>	<u>950</u>	<u>950</u>
2. Expenditure on Salaries (Rs. in lakhs)	124.44	164.29	213.62	299.07	359.94	537.53	447.47
3. Expenditure on Overtime (Rs. in lakhs)	7.13	11.20	12.99	13.47	21.75	25.94	49.54
4. Amount spent on welfare, subsidies, etc. (Rs. in lakhs)							
a) Canteen	4.71	6.16	6.85	8.85	13.29	15.65	17.89
b) Transport	5.21	5.44	6.68	6.72	9.36	8.75	7.49
c) Medical facilities	6.35	10.20	10.20	12.01	30.93	27.98	29.14
d) Other facilities	4.93	14.94	15.92	30.02	19.27	49.52	45.44
5. Total labour cost (2+3+4)	152.77	212.23	266.26	370.14	454.54	665.37	596.97
6. Value of raw material, stores, etc.	560.82	1054.67	1393.42	1315.00	1560.45	1280.32	2462.94
7. Value of production (including overheads)	894.80	1475.28	2021.54	1800.12	2236.98	1879.20	3952.20
8. Sales value realised	560.71	1311.36	1775.03	1739.45	2188.45	1560.14	3976.65
9. Loss(-)/Profit(+)	+16.96	+7.53	+4.55	-452.83	-375.04	-744.48	+254.83

ii) 144 employees were inducted from 1985-86 to 1991-92, though capacity utilisation had all along been very low.

The Ministry stated (December, 1992) that the different divisions of the Company handle widely different products and technologies needing different specialised skills. It was, therefore, not possible to make inter divisional transfers.

iii) In Consumer Electronics Division production of Colour TV went down but manpower was not reviewed. There were 42 employees on 31st March, 1992 (Production: Rs. 100.44 lakhs) as against 47 employees on 31st March, 1988 (Production: Rs. 181 lakhs).

The Management stated (May, 1992) that it was going to introduce a voluntary retirement scheme. But the surplus manpower is still to be identified.

However, the Ministry stated (December, 1992) that voluntary retirement scheme had not been introduced in the Company.

iv) Higher Pay Scales: The Company revised the pay scales of employees in January, 1988 incurring extra burden of Rs. 24 lakhs per annum which cut into estimated profit of Rs. 50 lakhs for the year 1987-88. The profit for the year 1987-88 came down to Rs. 4.55 lakhs because of other reasons also. The Company suffered losses of Rs. 452.83 lakhs and Rs. 375.04 lakhs, respectively, in 1988-89 and 1989-90 also. As per directions issued by Government in BPE's letter dated 6th June, 1984 revision of scales of pay when considered inescapable, required prior approval of Government which was not taken by the Company.

6.6 Research & Development Performance

i) The Department of Science & Technology entrusted the Company with "National Project on development of low cost Solar Photovoltaics products for various applications". The project was started in the year 1975 and the second phase commenced from 1980. A National Solar Photovoltaic Energy Demonstration Unit (NASPED) was started in October, 1980 and completed in September, 1985 at a cost of Rs. 13.20 crores. CEL is producing low cost Photovoltaics products using the facilities created under this project.

In addition to NASPED Project, the Company had undertaken 42 approved Research & Development Projects so far (March, 1992) as detailed below:-

A. Projects undertaken by the Company at its own instance with a view to develop products for later commercial exploitation, but no sale value realised:

Sl. No.	Name of the Project	Funded by	Year of		Actual cost so far (Rs. in lakhs)	Status	Sale value, if commercialised.
			Start	Completion			
i)	Reactive Alumina	DOE	1976	1984	18.23	Completed but not commercialised.	
ii)	18 Mil Memory Core	DOE	1977	1987	14.67	Completed but not commercialised due to product obsolescence.	
iii)	Light Emitting Diodes	DST	1977	1980	12.49	Completed and commercialised but discontinued due to unviability	N.A.
iv)	Microwave Oven	DOE	1979	1984	9.53	Completed but not commercialised.	
v)	Piezo Electric Element	DOE	1981	1985	9.56	Commercialised	N.A.
vi)	Phase Shifter C-Band	DRDL	1982	1987	17.24	Commercialised	N.A.
vii)	Magnetron Tubes	DOE	1983	1990	94.19	Commercialised but discontinued due to lack of further orders from Defence.	N.A.
viii)	Phase Shifter Dual Mode	DRDL	1984	1990	90.57	Commercialised	N.A.
ix)	Phase Shifter X-Band	DOE	1985	1988	20.18	Commercialised	N.A.

B.

Project funded by DNES

Salijipally Project	DNES	1980	1986	12.62	Experimental project for the supply and installation of SPV systems at the Village Salojipally in Medak Distt. of Andhra Pradesh.
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C. Projects assigned to the Company by the Department of Science & Technology(DST) for development of technology without specific reference to commercial production:

Sl. No.	Name of the Project	Funded by	Year of Start	Year of Completion	Actual cost so far(Rs. in lakhs)	Status	Sale value if commercialised.
i)	Laser (N2)	DST	1976	1986	3.00	Commercialised but very low volumes.	N.A.
ii)	Gratings	DST	1977	1980	11.10	Partly completed	
iii)	Aerial Camera	DST	1978	1987	8.50	Partly completed and then transferred to NIL Calcutta.	
iv)	Low cost Special Purpose Spectrometer	DST	1979	1983	6.23	Monochromator productionised.	
v)	Low cost Scanning Electron Microscope	DST	1981	1984	5.05	Only part of R&D completed.	
vi)	Xenon Arc Lamp	DST	1981	1985	17.24	completed but no commercial production	
vii)	Multi Audio Visual Systems	DST	1981	1986	2.95	Commercialised but discontinued.	N.A.
viii)	Hot Axle Detector	DST	1981	1986	12.79	Partly completed and discontinued due to lack of positive response from Railways.	
ix)	Tool & Test Plates	DST	1981	1986	2.95	Partly completed.	
x)	Double Monochromator	DST	1981	1987	5.50	Partly completed.	

xi) Optical Components	DST	1981 1987	1.00	Partly completed.	
xii) Photon counter	DST	1981 1988	15.19	Completed and productionised but very low volumes.	N.A.
xiii) Argon Ion Laser	DST	1981 1988	12.00	Partly completed.	
xiv) Built in Screen AVS	DST	1981 1988	6.51	Partly completed.	
xv) Software Developments	DST	1982 1987	7.70	Completed but not commercialised.	N.A.
xvi) Carbondioxide Laser	DST	1983 1986	3.24	Completed but low volume of production.	N.A.
xvii) HENE Laser	DST	1983 1986	3.96	Partly completed.	
xviii) IR Spectrometer	DST	1986 1987	4.01	Partly completed.	
xix) Scanning Electron Microscope	DST	1986 1987	4.56	R&D completed.	
xx) 35 MM Slide Projector	DST	1986 1988	8.22	Partly completed.	

In view of non-viability of these high tech low volume products all work on them has since been discontinued at C.E.L.

D. On-going projects which have direct relevance to the current commercial operations of the Company:

Sl. No.	Name of the Project	Funded by	Year of		Actual cost so far (Rs. in lakhs)	Status	Value of sales so far, if commercialised.
			Start	Completion			
i)	Multicrystalline Silicon Solar Cells.	DSIR	1986	On going	226.62	On going	
ii)	Ultra High Efficiency Solar Cells	DSIR	1988	-do-	39.78	-do-	
iii)	Railway Electronics	DSIR	1988	-do-	34.98	-do-	
iv)	New SPV Systems	DSIR	1988	-do-	29.87	-do-	
v)	High Permeability	DSIR	1989	-do-	40.00	-do-	
vi)	Amorphous Silicon SPV Systems	DNES	1989	-do-	13.00	-do-	
vii)	Pilot Production facilities for C-Band Phase Shifters	DRDL	1989	-do-	100.00	-do-	
viii)	Microwave and Communication Ferrites	DSIR	1991	-do-	-	-do-	
ix)	Solar Cell Process development	DSIR	1991	-do-	35.00	-do-	
x)	Pilot Production facility for High Permeability Ferrites	DOE	1991	-do-	1.00	-do-	
xi)	Twin Toroid Ferrites Phase Shifter	DOE	1991	-do-	-	-do-	
xii)	Laser Scanning Micrometer DST		1991	-do-	8.00	-do-	

- ii) Further details of seven major R&D projects (at Sl.No.vii, viii, ix of table in A above and i, ii, iii and iv of table in D above) are given below. Most of them are behind schedule.

Sl. No.	Name of Project	Brief Description of the Project	Sponsoring Authority	Estimated Cost		Actual Cost		Date of commencement	Scheduled date of completion	Actual date of completion
				Mate-rial	Labour	Mate-rial	Labour			
				(Rs. in lakhs)						
				(Rs.in lakhs)				of project		
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1.	Development of S-Band tunable high power magnetron	Development & engineering of tunable S-Band high power packaged magnetrons & development of relating technology for similar magnetrons (National Radar Council Tech. Develo. Project.	DOE	60.00	6.25	85.79	8.40	28.11.83	28.11.86	31.3.90
2.	Development of X-Band Phase Shifters	Engineering Development & productionisation of ferrite and dielectric for X-Band dual mode ferrites phase shifters	DOE	54.10	4.35	11.89	8.29	30.03.85	31.03.88	29.09.88
3.	Development of C-Band Dual mode Ferrite phase shifters	Engineering Development of dual mode ferrite phase shifters.	DRDL	90.48	-	52.62	37.95	16.08.84	16.08.88	31.03.90
4.	Development of Railway Electronic Equipment power	Setting up an appropriate facility for measuring some of the parameters.	DSIR	33.00	17.00	20.20	14.78	27.12.88	31.03.90	Not yet completed.

5.	Development of Ultra High efficiency solar cells.	Improving the efficiency of single crystal-line solar cells.	DSIR	64.00	11.00	30.23	9.55	27.12.88	31.03.90	Not yet completed
6.	Multicrystalline silicon ingots technology	Development of the technology for casting multi-crystal-line silicon ingots together with the development of a solar cell manufacturing process to convert ingots into high quality of solar cells.	DSIR	356.00	44.00	192.56	34.06	26.09.86	31.03.90	Not yet completed
7.	New SPV System	Identification and development of New SPV system needed to achieve the projected growth SPV market.	DSIR	25.00	25.00	20.87	9.00	27.12.88	31.03.90	Not yet completed

iii) As on 31st March, 1992 the amount of unspent grants-in-aid received for R&D projects and lying with CEL was Rs.7.43 crores of which Rs.1.40 crores were kept in the bank and the balance amount of Rs.6.03 crores was diverted for purposes other than R&D. The R&D project grants were used as ways and means resources to finance the Company accumulating losses.

The Management confirmed (July, 1992) that the Company needed additional working capital because losses suffered by the Company eroded such capital and the surplus fund received for R&D Projects were utilised as working capital.

iv) The budgetary support to the company from 1974 for Non R&D as well as R&D purposes is given below:

(Rs. in lakhs)

Year	Non R&D			R&D		
	Equity	Loan	Total	Grant	Loan	Total
1974-75	50.00	-	50.00	-	-	-
1975-76	85.00	25.00	110.00	14.15	-	14.15
1976-77	85.00	25.00	110.00	39.00	7.40	46.40
1977-78	95.00	50.00	145.00	50.60	6.34	56.94
1978-79	35.00	70.00	105.00	-	4.78	4.78
1979-80	25.00	65.00	90.00	3.66	8.40	12.06
1980-81	-	65.00	65.00	138.12	4.73	142.85
1981-82	50.00	25.00	75.00	271.32	7.83	279.15
1982-83	35.00	34.80	69.80	340.16	1.95	342.11
1983-84	50.00	50.00	100.00	397.70	-	397.70
1984-85	165.00	93.00	258.00	312.00	-	312.00
1985-86	310.00	50.00	360.00	24.80	-	24.80
1986-87	200.00	310.00	510.00	92.75	-	92.75
1987-88	-	220.00	220.00	235.00	-	235.00
1988-89	180.00	400.00	580.00	194.00	-	194.00
1989-90	200.00	227.00	427.00	322.39	-	322.39
1990-91	230.00	180.00	410.00	253.41	35.31	288.72
1991-92	92.67	143.33	236.00	280.96	-	280.96
TOTAL:	1887.67	2033.13	3920.80	2970.02	76.74	3046.76

v) The Multicrystalline Silicon Solar Cells Project was taken up by the Company in September, 1986. Technology was to be developed at a cost of Rs.400 lakhs by March, 1990. The project has not been completed so far (December, 1992).

The Ministry stated (December, 1992) that multicrystalline silicon ingot growing equipment (cost: Rs.127.94 lakhs) has been received and installed. It will be put into use as soon as the 33 KV power line becomes operative.

vi) The Ultra High efficiency Single Crystalline Silicon Solar Cell project (cost Rs.75 lakhs) was taken up by the Company in December, 1988. The project was to be completed by 31st March, 1990. There was delay in reaching a technology cooperation agreement with the University of New South Wales, Australia which was concluded in November, 1990. Expenditure incurred upto 31st March, 1992 was Rs.39.78 lakhs.

The Ministry stated (December, 1992) that completion of pilot facility for production of UHE cells in the Company was now targetted for March, 1993. It will start running by 30th September, 1993.

vii) 18 Mil Memory Core development project was taken up by the Company in January, 1977 at a cost of Rs.16.70 lakhs. The project was closed in March, 1987 after incurring expenditure of Rs.14.67 lakhs. By the time the Core was developed, it had become obsolete. An unutilized balance of Rs.2.03 lakhs was retained by the Company which requested for conversion of the loan granted for the project to be converted into a grant-in-aid.

viii) The R&D projects have not added to the commercial viability of the Company significantly and are likely to remain a collection of pilot plants suited to R&D efforts and not to assessed market demands and market prices.

The Ministry stated (December, 1992) that most of the R&D projects carried out by the Company fall in different categories, not all of them being undertaken with the purpose of commercialisation. Certain projects entrusted to the Company by the Department of Science & Technology were mainly for technology development. All the R&D projects now being financed by the Company are targetted at commercial exploitation.

6.7 Materials Management

i) The Company does not maintain list of approved suppliers or vendors for making limited enquiries. It prepares a broad list of the suppliers for each indent keeping in view past performance of the suppliers. But for orders of value more than Rs.1 lakh Company invited open tenders. But, in many cases this was not done as given in

Annexure. The Management stated that in such cases only limited number of potential suppliers were there.

- ii) Loss on Purchase of Liquid Nitrogen: The Company procured Liquid Nitrogen from three firms in August, 1984 as detailed below:

Firm	Rate per Litre (Rs.)	Quantity Ordered (Litres)	Quantity Received (Litres)
A	5.20	1,00,000	1,43,400
B	4.95	45,000	20,383
C	4.50	25,000	20,494

The Company entered into an agreement with firm 'A' in August, 1985 for supply at Rs.6.60 per litre for a period of 5 years. The Company, as per agreement allowed escalation in price at Rs.0.51 per litre with effect from 28th October, 1986 and at Rs.1.32 per litre with effect from 1st December, 1987 because of increase in power tariff.

After efforts to find an alternative source of supply Company placed an order in March, 1988 on firm 'C' for supply of 1,00,000 litres at rate of Rs.6.07 per litre inclusive of all taxes which was cheaper than price (Rs.8.43 per litre) agreed to with firm 'A' by Rs.2.36 per litre.

In addition to the two escalations the Company also allowed additional price increase of 40 per cent of the escalations towards other costs though such payment was not covered under the agreement.

The Management stated (December, 1991) that very few suppliers were able to supply the quantity at the purity needed for ferrite production. But reasons for not negotiating with the other two firms before entering into a 5 year agreement were not given.

The Company also advanced a sum of Rs.1.92 lakhs to firm 'A' to enable them to tide over their financial problems in August, 1985. In June, 1986 again Rs.5 lakhs were

paid to firm 'A' and Rs.1.75 lakhs in September,1986 on request from firm 'A' to get over financial difficulty. The loans were given without any guarantee or security.Firm 'A' discontinued supply after 20th November,1989 when Rs.5.57 lakhs were outstanding from the supplier.

The Ministry stated (December,1992) that the Company had since arrived at an amicable settlement with firm 'A' in respect of outstanding dues and had been able to recover all the loans advanced to the party. But, it was noticed that out of Rs.6.60 lakhs (including interest of Rs.5 lakhs) due from firm 'A' as on 31st March,1992, the Company recovered Rs.4.57 lakhs and balance amount of Rs.2.03 lakhs was written off.

The Company thus incurred avoidable expenditure of Rs.11.21 lakhs on purchase of 2,95,120 litres of liquid Nitrogen during the period from April,1988 to March,1989 from firm 'A' including Rs.1.35 lakhs of excise duty.

iii) Delay in utilisation of Tapping Machine:

An Automatic Head Welding Machine was imported as a proprietary item through an Indian Agent at a cost of Rs.40,68,074. The Company placed the purchase order on 30.6.1988 at US \$ 1,56,450 FOB, (USA). The machine was to be despatched by the supplier after test in the presence of the CEL's representative.

On the request of the foreign supplier letter of credit for US \$ 1,48,627.50 was established on 23.2.1990 which was valid upto May, 1990. A team of three persons from Company visited the works of the supplier in USA during February and March,1990 for testing the machine before despatch. While the supplier thought that team from Company had cleared the machine and despatched the machine, the

Company later denied having cleared the machine saying it had done only some quick tests.

The machine was despatched by the supplier on 15th April, 1990. I was at Delhi Airport from 17th April, 1990 to September, 1991 till delivery was taken by the Company after trying to tell the supplier that it had not tested the machine.

Engineers of supplier came in February, 1992 and commissioned the machine in February and March, 1992. Management stated (December, 1991) that supplier agreed to send its engineers free of charge for installation and alignment and ensure that breakages of solar cells in tabbing were within specified limits. Had Company returned the machine the current price would be Rs. 80 lakhs. The reply was silent on delay in using machine for about two years.

The Ministry stated (December, 1992) that the delay in clearance of the equipment was mainly due to Company's concern to protect its interest and ensuring performance of the machine. But, the reply does not justify the delay which was clearly avoidable.

iv) Payment of demurrage/wharfage: Company had paid heavy demurrage and wharfage charges from 1986-87 to 1991-92 as detailed below:-

Year	Payment of demurrage/wharfage (Rs. in lakhs)	No. of cases
1986-87	1.35	24
1987-88	1.78	66
1988-89	2.70	113
1989-90	3.23	172
1990-91	4.15	198
1991-92	N.A.	N.A.

The Company did not analyse reasons for payment of demurrage and wharfage charges with a view to take remedial measures.

The Management stated (December, 1991) that Company was tight on working funds and had to delay clearances for want of funds. The reasons for extending purchases beyond ability to generate funds as a commercial enterprise were not given.

v) Inventory Levels: The following inventory holding norms have been laid down by the Management.

a) Imported raw-materials - 12 months' consumption.

b) Indigenous raw-materials- 6 months' consumption

c) Stores & Spares - 4 to 6 months' consumption.

But, inventory levels of imported as well as indigenous stores & spares, etc. varied from 7 months' to 37 months' consumption between 1985-86 and 1991-92 which was far in excess of the norms laid down.

The Management stated (July, 1992) that Company had to keep adequate stock of imported raw-materials which was the main reason for the holding to exceed norm. But, the Company was silent over not revising norm for imported stores.

vi) Loss of silver paste: Physical verification of stores conducted in February, 1985 revealed a shortage of 45 Kgs. of imported silver paste valued at Rs.3.56 lakhs. The Company was unable to fix responsibility for loss or theft and a number of lacunae in the procedures adopted for taking material into stores, maintaining store record and issuing materials from stores to shops came to light.

The Ministry stated (April,1990) that it was not possible to pin point any defect in procedure which resulted in loss of silver paste.

vii) Loss on sale of plant: The Ceramic Capacitor plant installed in 1977-79 was found to be commercially unviable by 1980-81. The plant was closed in April,1982. Its book value was Rs.13 lakhs.

The plant was sold in November,1983 for Rs.20 lakhs. The Company had offered a presale inspection facility to the buyer and the plant was also in working condition at the time of sale. The plant was installed also to buyer's satisfaction in his premises. Certificates were given by the buyer on 27th January,1984 and 12th July,1984 on the satisfactory sale and installation. Commissioning of some remaining equipments was delayed because the buyer did not arrange for accessories as per terms of contract for sale. The payment in equal annual instalment with 12 per cent interest on deferred payments were not enforced by the Company.

In July,1985 i.e. after one year of commissioning of the plant, the buyer complained that equipment was unserviceable and therefore the agreement for sale was not binding and proposed disposal of the plant.

In a meeting in the Department of Scientific and Industrial Research in December,1985 the obsolescence of the plant was conceded by the Company but its working condition was not disputed. Still, retention of parts of plant worth Rs.1.39 lakhs by the buyer and disposal of the remaining plant by buyer on behalf of Company was agreed by the Company.

The Department stated that Company was denied the benefit of sale agreement. The loss to the Company was

notional since the Company would otherwise have carried the plant unused for next 4 to 5 years.

The Department's reply is not tenable as it transforms the decision of the Company to effect a sale under its own power. The Company sold the plant after inspection by buyer and it was in working condition. Whether the Ministry prevailed upon the Company not to enforce its right to payment under the terms of the sale agreement was not clear.

The Company received payment for only Rs.1.39 lakhs towards equipment retained by buyer and Rs.0.75 lakh towards proceeds of sale by auction of the balance of plant. Thus, the Company lost Rs.17.86 lakhs on the sale of the equipment.

CHAPTER VII

MARKETING & PRICING

7.1 The Company formulated a 10 year perspective plan 1982-92 in March, 1982 and a five year plan, as also Annual plan. The projections made in the plans are given below:

	(Rs. in lakhs)						
	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92
A. Production							
a. i) As per perspective plan	995.20	1350.20	1734.20	1874.20	2009.20	2139.20	2199.20
ii) As per Five Year Plan	1383.00	3981.00	6030.00	7431.00	8352.00	N.A.	N.A.
iii) As per Annual plan	1034.00	1600.00	2000.00	2510.00	2695.00	2600.00	3495.00
b. Actual Production							
i) Solar Photovoltaics	436.13	990.94	1368.24	1276.23	1654.90	1198.98	2796.90
ii) Professional Ferrites	124.63	142.57	224.51	221.21	179.82	231.26	360.69
iii) Instruments & Systems	168.91	185.30	211.42	127.46	278.81	316.28	612.24
iv) Consumer Electronics	61.50	102.06	181.41	81.47	47.96	77.76	100.44
v) Electronics Ceramics	26.60	31.58	21.61	20.49	41.01	42.20	64.95
vi) Electron Tubes	20.65	6.69	20.92	73.25	34.48	12.72	16.98
vii) Power Electronics	56.38	16.06	-	-	-	-	-
Total:	894.80	1475.20	2028.11	1800.11	2236.98	1879.20	3952.20
B. Sales							
a. i) As per perspective plan	995.20	1350.20	1734.20	1874.20	2009.20	2139.20	2199.20
ii) As per five year plan	1383.00	3981.00	6030.00	7431.00	8352.00	N.A.	N.A.
iii) As per Annual plan	943.00	1500.00	1950.00	2530.00	2811.00	2763.00	3700.00
b. Actual Sales	560.71	1311.36	1775.03	1739.45	2188.45	1560.14	3976.65
C. Profit before tax							
a. i) As per perspective plan	-	143.26	343.93	351.50	376.41	394.97	409.89
ii) As per five year plan	162.94	580.51	969.29	1007.12	1095.26	N.A.	N.A.
iii) As per Annual plan	48.42	35.40	46.25	36.45	-104.70	-425.55	-195.00

b. Actual Profit(+)/Loss(-)	+16.96	+7.53	+4.55	-452.83	-375.04	-744.48	+254.83
D. Capital Expenditure (Cumulative upto end of year)							
a. i) As per perspective plan	1087.00	1103.00	1166.00	1205.00	1219.00	1227.00	1232.00
ii) As per five year plan	902.00	1518.00	1937.00	2025.00	2161.00	N.A.	N.A.
iii) As per Annual plan	869.98	1169.98	1569.98	1969.98	2444.98	2854.98	3103.98
b. i) Actual capital expenditure	614.37	810.04	931.81	935.02	1047.73	1085.08	1284.55
ii) Capital work-in-progress	239.57	113.83	61.00	97.49	97.85	402.48	364.71
Total (i)+(ii)	853.94	923.87	992.81	1032.51	1145.58	1487.56	1649.26

It may be seen that annual and five year plans were unrealistically high and actuals corresponded more closely to perspective plan all along. Though the production and sales were the same or near about the perspective plan of 1982, the profits were just not there in later years but only losses. This indicates that products could not be sold at prices as would recover cost.

The Management stated (July, 1992) that product mix had changed subsequent to framing of perspective plan in 1982, because of which five year and annual plan targets varied. But Company did not get orders for quantities expected in five year and annual plans.

The Ministry stated (December, 1992) that in some years the Annual Plan targets could not be met due to non-fructification of expected orders.

7.2 The Company has a three tier system for marketing which includes a marketing division whose job is to create demand for products by demonstration and canvassing of orders and to plan production accordingly. The flow of orders in recent years is given below:

		(Rs. in lakhs)					
Product		1986-87	1987-88	1988-89	1989-90	1990-91	1991-92
1. S.P.V.	Opening Balance	740.79	872.29	1315.96	967.00	444.03	830.07
	New Orders	1029.49	1631.83	817.68	1054.03	1416.04	3350.39
	Order Executed	897.99	1188.16	1166.64	1577.00	1030.00	2887.04
	Closing Balance	872.29	1315.96	967.00	444.03	830.07	1293.42
2. Ferrites	Opening Balance	40.13	22.88	50.83	23.51	48.16	116.78
	New Orders	133.28	240.49	171.26	213.26	250.62	336.41
	Orders Executed	150.53	212.54	198.58	188.61	182.00	327.33
	Closing Balance	22.88	50.83	23.51	48.16	116.78	125.86
3. PZT	Opening Balance	42.67	18.00	29.37	40.50	33.61	20.03
	New Orders	6.70	26.03	35.66	32.75	23.17	45.14
	Orders Executed	31.37	14.66	24.53	39.64	36.75	58.94
	Closing Balance	18.00	29.37	40.50	33.61	20.03	6.23
4. Systems	Opening Balance	77.62	157.67	62.31	249.08	390.70	762.69
	New Orders	251.18	102.02	358.90	419.02	592.25	244.31
	Orders Executed	171.13	197.38	172.13	277.40	220.26	550.19
	Closing Balance	157.67	62.31	249.08	390.70	762.69	456.81
5. Magnetron	Opening Balance	44.08	89.59	74.79	40.98	13.08	18.00
	New Orders	52.93	4.97	25.49	28.55	6.17	73.90
	Orders Executed	7.42	19.77	59.30	56.45	1.25	15.90
	Closing Balance	89.59	74.79	40.98	13.08	18.00	76.00
6. CTV/PTV	Opening Balance	-	9.05	16.34	237.95	244.03	5.28
	New Orders	61.97	149.81	339.88	55.44	34.20	133.75
	Orders Executed	52.92	142.52	118.27	49.36	272.95	137.26
	Closing Balance	9.05	16.34	237.95	244.03	5.28	1.77

The Management stated (December, 1991) that major orders came from Government Departments.

7.3 Exports: The value of exports made by the Company to Indonesia, Sri Lanka and U.S.A. during the years 1988-89 to 1991-92 are given below along with total sales:

(Rs. in lakhs)		
Year	Value of Export	Total Sales
1988-89	8.10	1739.45
1989-90	0.86	2188.45
1990-91	0.25	1560.14
1991-92	1.68	3976.65

7.4 Costing & Pricing

i) The Company estimates material cost, direct labour cost and indirect expenses (as percentage of direct labour cost) and margin of profit. The selling prices are fixed after comparing the estimated costs with the competitors' prices in market. The Company has not mentioned detailed costing data. However, detailed costing for Solar Cell/modules production and the turn key projects undertaken by the Systems group have now been taken up by the Company.

The Company had not formulated any refined or competitive pricing policy for different products manufactured or assembled by it. Price was fixed by the Chairman & Managing Director taking into account estimated cost of production and competitiveness of products of CEL in market.

The Company clarified (December, 1992) that it had started maintaining cost records from June, 1992 and hoped to build up proper cost records for each product in future.

ii) In SPV division (Cells and Modules) the Company gets orders of DNES (Department of Non-Conventional Energy Sources) at prices fixed by latter, but is unable to cover its cost.

Year	Price per unit demanded by CEL to cover cost	Price per unit allowed by DNES
	(Rs.)	(Rs.)
1987-88	135.56	134
1988-89	148.55	134
1989-90	153.30	146
1990-91	177.80	164
1991-92	243.00	225

Apart from stating that DNES would not agree to pay the price wanted by CEL, the Management had no explanation for contracting to supply at a loss as there was no compulsion on CEL to sell to DNES at a loss. Clearly the

Company had not used its marketing division to create markets for its products at viable prices.

Ministry stated (December, 1992) that the SPV is in a developmental stage all over the world and cost is not affordable by the common man. Therefore, the Company did negotiate with DNES to obtain better prices. It had little leverage with DNES to get better prices as there were very few other buyers. Later, the Company was able to generate new SPV applications and secure orders for the SPV systems from other customers and it reduced its dependence on orders from DNES.

The Company needs to avoid being heavily dependent on Government orders and to stand competition without demanding cost plus basis for sale prices.

7.5 Credit Sales:

The size of debtors of the Company at the end of recent years are given below:

Year	Total debts		Debts considered doubtful		(Rs. in lakhs) Sales made to		Percentage of debts to sales
	Govt. Deptt./ PSUs	Private Parties	Govt. Deptt./ PSUs	Private Parties	Govt. Deptt./ PSUs	Private Parties	
	1985-86	170.84	19.61	1.29	2.70	368.40	
1986-87	326.46	41.29	2.76	2.72	1050.46	189.98	29.65
1987-88	283.45	538.78	22.51	5.92	1404.19	304.44	48.12
1988-89	913.35	58.82	66.95	5.68	1542.22	122.98	58.38
1989-90	993.65	78.17	77.40	5.87	1908.98	167.83	51.61
1990-91	737.72	46.07	60.35	4.00	1240.96	255.20	52.39
1991-92	1626.38	71.86	55.42	24.33	3467.86	353.25	44.44

Sundry debtors as percentage of sales was high.

The Management stated (December, 1991), that payments are delayed because of the insistence of the Government customers on production by the Company of receipts from the actual users who often were in remote

areas. The explanation only reflects on the inadequacy of marketing efforts. The Company stated (December, 1992) that except for Rs.4 crores of disputed debts, it did not face any problems in realisation of dues. There was no problem with DNES or Telecommunication Department and it was receiving 35 per cent of the sale price as advance with the order and 30 per cent on despatch of supplies. But, protracted correspondence was necessary for realisation of dues from Railways.

The Ministry stated (December, 1992) that it would not be possible to ensure timely realisation because the Company was essentially in a buyers' market and was dependent on procedures of Government Departments and Public Sector Undertakings who were the main customers. Efforts being made to remedy the procedures were not stated.

7.6 The present level of tariff protection enjoyed by the Company for SPV cells and modules against imports was around 60 per cent. The Company needs to avoid being heavily dependent on Government orders and to stand competition against imports with likely levels of tariff protection.

7.7 Liquidated damages for delay in delivery:

A customer placed a purchase order on the Company, in March, 1986 for four Solar Photovoltaic System valuing Rs.56 lakhs. The first System was to be delivered within four months and the remaining within the period specified. Customer also paid 40 per cent advance and stipulated liquidated damages on delay at 2 per cent per month or part thereof subject to a maximum of 10 per cent of the value of the contract.

All the four systems containing their different items were supplied by the Company between October, 1986 and

October, 1987. The customer deducted Rs.5.60 lakhs towards liquidated damages for delay in supply.

The Management stated (December, 1991) that from 76 mm diameter silicon solar cells the Company had switched over to 100 mm diameter cell which caused delay. But Company was silent on the losses it was incurring by paying damages for delay.

The Ministry stated (December, 1992) that the Company had taken up the matter of waiver of liquidated damages at higher levels. The reply was silent on avoiding delay after contracting.

7.8 Delayed Installation and Pending claims:

A customer placed an order on CEL in February, 1987 for commissioning within two months 14 Graphic Image Colour Projection TV Receivers at Rs.1,01,329.96 each. CEL could supply and install 6 sets by June, 1987. The remaining 8 sets though despatched in June, 1987 could be installed by CEL only by January, 1990. The customer has not paid so far (December 1992) for the 8 sets.

7.9 Non-recovery from ex-distributor:

The Company appointed a sole distributor for marketing Projection Colour Television Receivers (PTV). The Company continued supplying PTV sets to the distributor even after expiry of the agency agreement on 30th July, 1987 and Rs.3.24 lakhs was due from ex-agent as on 31st March, 1992. The distributor disputed (October, 1990) the amount due on the ground of his claim for discounts due from the Company.

The Management stated (December, 1991) that the distributor had given no proof of amount due from Company. It was silent on supplies made after expiry of agency agreement when the deposit given by the agent also was adjusted making recovery of dues difficult.

N. Sivasubramanian

(N. SIVASUBRAMANIAN)

Deputy Comptroller and Auditor General
-cum-Chairman, Audit Board

New Delhi
The

Countersigned



(C.G. SOMIAH)

Comptroller and Auditor General of India

New Delhi

The

• LIST OF CASES WHERE LIMITED TENDERS WERE CALLED WHEN OPEN TENDERS SHOULD HAVE BEEN INVITED.

S.No.	P.O.No.	Date	Value of Purchase (Rupees)
1.	1603	06.08.88	10,80,806
2.	16525	23.12.88	1,89,550
3.	16566	31.12.88	33,75,000
4.	16574	03.01.89	1,98,000
5.	16928	27.03.89	2,10,000
6.	17282	28.07.89	2,65,200
7.	17431	22.06.89	2,74,000
8.	17575	16.10.89	3,00,000
9.	17711	05.11.89	1,87,500
10.	17906	12.02.90	1,79,010
11.	18045	08.03.90	13,71,331
12.	18049	30.03.90	4,67,800