18

STANDING COMMITTEE ON DEFENCE (2006-07)

FOURTEENTH LOK SABHA

MINISTRY OF DEFENCE

IN-DEPTH STUDY AND CRITICAL REVIEW OF BHARAT ELECTRONICS LIMITED (BEL)

EIGHTEENTH REPORT

सत्यमेव जयते

LOK SABHA SECRETARIAT
NEW DELHI

May, 2007/*Vaisakha,* 1929 *(Saka)*

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Presented to Lok Sabha on 7.5.2007
Laid in Rajya Sabha on 7.5.2007

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PREFACE

I, the Chairman, Standing Committee on Defence (2006-07) having been authorised by the Committee to submit the Report on their behalf, present this Eighteenth Report on the subject 'In-depth Study and Critical Review of Bharat Electronics Limited (BEL)'. The subject was selected for examination by the Standing Committee on Defence during 2006-07.

2. The Committee, during their examination of the subject, took evidence of the representatives of the Ministry of Defence on 4 October 2006 and 12 December 2006. The Committee also undertook an on-the-spot study visit to Bharat Electronics Limited, Bangaluru on 18 November 2006 for an in-depth analysis of the subject matter.

3. Based on the background note, written replies to the list of points furnished by the Ministry of Defence on the subject, briefing/ oral evidence tendered by the representatives of the Ministry, including the Chairman, BEL, and the observations made by the members of the Committee during the Study visit, the Committee considered and adopted the draft Report at their sitting held on 12 February 2007.

4. The Committee have inter-alia recommended for organisational restructuring of the various units of BEL, need for conferring additional power to the Board of Directors to enable it to take independent decisions on project sanction, joint ventures with private sector and R&D etc., Nava Ratna status for BEL, establishment of new infrastructure to improve efficiency in BEL, need for expanding export market by way of manufacturing diversified and high-end products, need for regularly updating technologies to match the challenges of international market, close examination of modernization/upgradation measures, retention of R&D engineers and technical staff with appropriate revision of pay structure and involvement of private sector in manufacturing of items of critical/classified technologies.

5. The Committee wish to express their thanks to the representatives of the Ministry of Defence for appearing before the Committee for evidence and for furnishing the material and information in a very short span of time which the Committee desired in connection with the examination of this subject.

6. For facility of reference and convenience, the observations/ recommendations of the Committee have been printed in thick type in the body of the Report.

NEW DELHI;
15 *March,* 2007
24 *Phalguna,* 1928 *(Saka)*

BALASAHEB VIKHE PATIL,
Chairman,
Standing Committee on Defence.

CHAPTER I

INTRODUCTION

1.1 India continuously strives to achieve self-reliance in Defence industries through indigenisation, development and production of Defence equipment both in public and private sectors under the overall supervision of Department of Defence Production of the Ministry of Defence. The Department has eight Defence Public Sector Undertakings which have substantially developed their infrastructure over the years to cater to the basic strategic requirements of Defence Forces. Bharat Electronics Limited (BEL) is one of the eight Defence Public Sector Undertakings. It was established at Bangalore by the Government of India under the Ministry of Defence in the year 1954.

1.2 BEL believes in the following values :—

- Putting customers first.
- Working with transparency, honesty and integrity.
- Trusting & respecting individuals.
- Fostering team work.
- Striving to achieve high employee satisfaction.
- Encouraging flexibility and innovation.
- Endeavouring to fulfil social responsibilities.
- Proud of being a part of the organization.

1.3 The following are the objectives of BEL :—

- To be a customer-focused company providing state-of-the-art products & solutions at competitive prices, meeting the demands of quality, delivery and service.
- To generate internal resources for profitable growth.
- To attain technological leadership in Defence Electronics through in-house R&D, partnership with Defence/Research Laboratories and Academic Institutions.
- To give thrust to exports.
- To create a facilitating environment for people to realize their full potential through continuous learning and team work.

- To give value for money to customers and create wealth for shareholders.
- To constantly benchmark company's performance with best-in-class internationally.
- To raise marketing abilities to global standards.
- To strive for self-reliance through indigenisation.

DECADE WISE DEVELOPMENT OF BEL

1. The First Decade (1954-1964)—Infant Years of the Company

1.4 In April 1954, Bharat Electronics Limited (BEL) came into being at Jalahalli, Bangalore. Starting with a modest turnover of Rs. 2 lakhs in 1956-57, by the end of the decade, BEL registered a turnover of Rs. 4.69 crores in 1963-64. BEL recorded its maiden profit of Rs. 7 lakhs in 1959-60, which went up to Rs. 54 lakhs in 1963-64.

1.5 BEL started off with a core group of French and Indian engineers and managers. The first batch of technicians was recruited in October 1954. A training school, Technical Training Centre, was established at that time to train the recruits. The first batch of senior officers were recruited in 1955 and sent to France for training. With a staff strength of 768 in March 1957, the number of personnel in BEL rose to 4,035 by March 1964.

Difficulties/Challenges Faced

1.6 Like any other evolving company, BEL too had to face challenges during its formative period. CSF, France who were assisting BEL were not fully equipped to plan and construct a factory of BEL's size. Delays were also encountered in converting French documents into English. Morale of the technical officers & workforce was low as the pay scales were quite meagre. The Managing Director of the company had to approach the Board for even trivial matters, as he was not totally empowered. The company had also to face the challenge of unreasonable terms & conditions set by the collaborators for entering into ToT agreements.

2. The Second Decade (1965-1974)—Laying of R&D Foundation

Products & Infrastructure

1.7 Manufacture of a VHF transreceiver began in 1967 in collaboration with RCA. HF communication sets were made in the

late Sixties with Siemens technology and in 1971 with BEL design. BEL started manufacturing in-house designed V/UHF communication sets in the early Seventies.

1.8 BEL started making radars in collaboration with LRDE – and S-Band Local Warming Radar in 1967 and an X-Band Field Artillery Radar in 1972. The second Unit of BEL was set up at Ghaziabad in 1974 to cater to the Air Defence Ground Environment Systems (ADGES) of the Indian Air Force. This Unit started manufacture of an S-Band 3-D Radar with a range of 230 nautical miles for air surveillance in 1974 in collaboration with Thomson CSF. Secondary Surveillance Radars were manufactured in association with DLRL from the early Seventies. A Storm Warning Radar of BEL design was made in the early Seventies. Frigate Radar Systems were manufactured in collaboration with HAS, Holland, in 1964.

1.9 BEL pioneered the radio and television networks in India by manufacturing transmitters for All India Radio from 1965 with technology from NEC, Japan, and TV transmitters for Doordarshan from 1973. BEL also started supplying Transmitting Tubes to AIR and for civil and defence communication requirements in the late Sixties. Microwave Tubes, Magnetrons and Small Signal Devices were manufactured in the late Sixties in collaboration with Philips, Holland. BEL started making Black & White TV Picture Tubes in 1970 with NEC technology. In 1971, BEL started making Power Devices and Digital ICs with RCA technology. BEL started manufacturing X-ray tubes with Siemens technology in the early Seventies. BEL made UHF Radio Relays for the Dept. of Telecommunication in 1974.

1.10 BEL started outsourcing by setting up the Ancillary Industrial Estate in 1964-65 at Bangalore for offloading low-tech jobs.

1.11 Research & Development took root during this decade. R&D departments were formed. Many products of BEL design rolled out like HF and VHF radios and Storm Warning Radar. BEL continued to benefit from collaboration with world technology leaders like Siemens, Thomson CSF, HAS, NEC, RCA and Phillips. BEL's association with DRDO labs like LRDE and DLRL began. The ambitious plan to develop a new generation almost state-of-the-art equipment necessitated a massive upgradation of infrastructure.

1.12 BEL's turnover rose from Rs 6.17 crores in 1964-65 to Rs 48.71 crores in 1973-74. A maiden dividend of 5% was paid during 1964-65. From a PBT of Rs 0.97 crores in 1964-65, BEL registered PBT of Rs 7.46 crores in 1973-74. Dividend of 12% was paid.

1.13 The staff strength nearly tripled during the decade - from 4,825 in 1964-65 to 14,053 in 1973-74. Lot of welfare activities were started including setting up of Co-operative Society, Housing Society, Death Relief Fund, Employees' Welfare Fund, Creche, Hospital, School, Sports Club and Fine Arts Club.

1.14 BEL's association with reputed global companies gave it an opportunity to evolve an integrated approach to Quality. Quality Assurance became a way of life at BEL. Quality and Reliability Departments were set up in 1972 as also Environmental Testing Labs. A Quality Manual was brought out in 1974 and Quality of Designs in the early Seventies.

Difficulties/Challenges Faced

1.15 After the first decade of existence, the business started growing and the company felt a need to create five self-contained Divisions, in a phased manner, for increasing its product profile. BEL had to go to the Government to increase its level of production as it had no authority for the same. The company also witnessed during its decade a lockout of 18 days due to disturbance and disorderly behaviour resorted to by a section of the employees. During this decade, the company also had to reassess its plant, machinery, personnel, capital investment to adopt itself to manufacture new generation of equipment using advanced technology like Integrated Circuits, Multilayered Wiring etc. One of the major challenges of this decade was preparing a detailed project report for setting up a new Manufacturing Unit to meet the Air Force requirement of Radars, Troposcatters and Microwave Communication Equipment which led to the setting up of second unit of BEL at Ghaziabad.

3. The Third Decade (1975-1984)—Expansion Phase

Products & Infrastructure

1.16 BEL supplied in-house designed HF and VHF transreceivers, UHF Radio Relays, Radios and Analog Tropo – both static and mobile, to the Indian Army in the Seventies. In the early Eighties, BEL manufactured Automatic Electronic Switch for the Army with LRDE technology. PSM 33, a 3-D Mobile Radar, was manufactured in collaboration with Thomson CSF and supplied to the Indian Air Force in 1983. BEL manufactured Cymbeline X-Band Tracking Radar under licence from Thorn EMI, UK, for the Army in 1984. Naval Surveillance Radars and Navigational Radars were supplied to the Navy in the Eighties. Sonars with NPOL technology were supplied to the Navy in the late Seventies.

1.17 BEL-made Microwave Transmitters, FM Transmitters, TV Transmitters and TVROs continued to roll out during the Seventies and Eighties. Manufacture of Vacumm Interrupter Tubes began in 1984 with Siemens technology.

1.18 The third Unit was established at Pune in 1979 to manufacture X-ray Tubes and Batteries. In 1983, an ailing Andhra Scientific Company (ASCO) was taken over by BEL as the fourth manufacturing Unit at Machilipatnam, which made optical products. In 1980, BEL's first overseas office was set up at New York for procurement of components and materials. CNC machines were introduced in the late Seventies. A modern PCB manufacturing facility was set up. An antenna test facility was set up at Sohna in 1974.

1.19 BEL matured in the development of VHF, HF and UHF equipment as well as TV and audio broadcast equipment and TVROs. BEL entered the 3-D Radar arena in a big way. BEL honed its components manufacturing capabilities. The association with DRDO labs continued. BEL developed the Electronic Voting Machine. The D&E Divisions were organized on the basis of product specialization. The concept of 'equipment families' was conceived and implemented in D&E.

1.20 BEL gave ToT to GCEL for V/UHF receivers and Low Power TV Transmitters; to ECIL for EVM; and to Suchitra, Hyderabad, for Black & White TV Tubes.

1.21 The turnover tripled from Rs. 43.15 crores in 1974-75 to Rs. 154.93 crores in 1983-84. The PBT rose from Rs. 4.82 crores in 1974-75 to Rs. 26.94 crores in 1983-84. The dividend was 12%.

1.22 The manpower rose from 15,340 in 1974-75 to 18,207 in 1983-84. The Office Order on Career Plan came out in 1975.

1.23 The Quality Control Circle (QCC) movement started in 1981 at Bangalore and Ghaziabad Units. It still is a vibrant activity at BEL.

Difficulties/Challenges Faced

1.24 As the company grew from strength to strength during the last two decades, the company was also facing the challenge of augmenting the strength of R&D engineers and provide them with suitable incentives. The number of R&D projects on hand was ever increasing. As the company's operations increased, it felt the need for computers to handle the task of inventory management, purchase follow

up, payroll preparation, book keeping and other labour intensive and time consuming jobs. This led to creation of Electronic Data Processing Centres in the factories. This decade also saw the company facing the financial difficulties due to accumulated losses of Ghaziabad Unit and high inventories at Bangalore factory due to recession in components market. For the second time in the history of BEL, the company had to face a prolonged strike and lock out on account of wage revision of its employees.

4. The Fourth Decade (1985-1994)—Emergence of a Premier Professional Electronics Company Products & Infrastructure

1.25 BEL-designed Fully Solid State HF receiver, VHF multi-role transreceiver, Secure Tactical Radio in VHF Band for manpack role, V/UHF transreceiver for ground-to-ground and ground-to-air communication, Secure Message Terminals and Encryptors were brought out in the Eighties and Nineties. In collaboration with LRDE, BEL manufactured an encryptor for HF transreceivers, a microprocessor controlled automatic exchange for use in the forward areas and a portable telephone Switch Board for field use at the battalion level during the Eighties.

1.26 BEL designed and manufactured Digital Tropo communication equipment for the Army and Air Force in 1985. BEL designed and supplied Control and Reporting Centre, a Satcom system for Radar networking, to the Air Force during 1990-93.

1.27 The BEL-designed Cyclone Warning Radar was supplied to the Indian Meteorological Department in 1985. The Flycatcher Radar, an air defence weapon control radar, was manufactured in collaboration with HSA and supplied to the Army in 1987. STENTOR, a long range X-band battlefield surveillance radar manufactured in collaboration with LCTAR, France, was supplied from 1990-92. INDRA Mk I, an air defence radar which was engineered concurrently with LRDE, was supplied to the Army and Air Force in 1992. Airport Surveillance Radar and Monopulse Secondary Surveillance Radar were manufactured in collaboration with Northrop Grumman, USA, and supplied to the Airports Authority of India in 1994.

1.28 1985 saw BEL manufacturing on a large scale Low Power TV Transmitters and TVROs for the expansion of Doordarshan's coverage. Transportable Satellite TV Uplink System was supplied to Doordarshan in 1993. Digital Microwave Systems, MUX equipment and electronic exchanges were supplied to DoT in the late Eighties.

1.29 BEL supplied the Navy with Shipborne Electronic Warfare Systems manufactured with technology from DLRL in 1990 and the Air Force with Radar Warning Receivers made with technology from DARE in 1994.

1.30 Laser Range Finders were manufactured in the late Eighties. Night vision binoculars with LRDE technology were made in the late Eighties. BEL-designed Tank Fire Control Systems were supplied to the Army in 1987. Gun Stabiliser System with Russian technology was supplied to the Army in 1988. BEL has been supplying EVMs to the Election Commission since 1989.

1.31 In 1985, the fifth Unit was set up in Chennai for supply of Tank Electronics, with proximity to HVF, Avadi. The sixth Unit was set up at Panchkula the same year to manufacture Tactical Communication equipment. 1986 witnessed the setting up of the seventh Unit at Kotdwara to manufacture Telecom Equipment, the eight Unit to manufacture TV Glass Shells at Navi Mumbai (which now makes Antennae, hydraulics, shelters and security systems) and the ninth Unit at Hyderabad to manufacture Electronic Warfare Equipment.

1.32 The agreement for setting up BEL's first Joint Venture Company, BE DELFT, with M/s Delft of Holland was signed in 1990. Recently, this became a subsidiary of BEL with the exit of the foreign partner and has been renamed BEL Optronic Devices Limited.

1.33 BEL gained expertise in VHF/UHF/Tropo Communication Systems and Secure Message Terminals. BEL's fruitful association with DRDO continued. BEL also continued to use technology from overseas. BEL established two Central Research Laboratories – at Bangalore in 1988 and at Delhi in 1992, to focus on futuristic R&D in areas of interest to BEL. R&D Departments were established in all the Other Units of BEL.

1.34 BEL experienced a sever Foreign Exchange crunch in the early Nineties. BEL, despite being dependent on import of professional and defence grade components requiring FE, took up the challenge of managing the FE crunch prudently and ensured that its performance and growth were not adversely affected.

1.35 In 1992, the first disinvestments (20%) and listing of the Company's shares in Bangalore and Mumbai Stock Exchanges took place. The second disinvestments (4.14%) took place in 1994.

1.36 The employee strength stabilized. It was 18,453 in 1984-85 and 18,422 in 1993-94. Thrust was given to training and development.

Advanced training for senior executives (GMs), managerial effectiveness programme for middle level executives (Managers) and 6-month management programme for Deputy Managers were introduced.

1.37 The Total Quality Management (TQM) philosophy was adopted by BEL and the acronym TORQUE (Total Organisational Quality Enhancement) was coined at BEL. The ISO certification programme started in 1993 and was completed across all Units in 1999.

Difficulties/Challenges Faced

1.38 This decade saw the company transforming form a company with a limited perspective into a multi-location, multi-product, multi-unit organization by setting up new Units at different parts of the country. The company faced the challenge of liberlization, privatization and globalisation process initiated by the Government in the country. The company had to face a severe foreign exchange crunch, which had an impact on its performance. During this decade, the company's equity was disinvested in two phases. In the first phase, 20% of the equity was disinvested and in the second phase disinvestments was 4.14%.

5. The Fifth & Early Sixth Decade (1995-2006) Till Date—A Decade of Growth

1.39 This decade is remembered as the Golden Era in the history of BEL. This decade saw growth of the company, manifold, created many records, crossed Rs. 1000 crores turnover during 1995-96, Rs. 2000 crores turnover during 2002-03 and Rs 3000 crores turnover during 2004-05.

1.40 During this decade, BEL also faced the regime of US sanctions and Passive sanctions from some of the European countries. These resulted in awakening BEL by concentrating more on non-US components in its design. BEL successfully faced the sanction regime and it turned out very beneficial to the company as BEL could carry out many design changes in its products to overcome the sanctions. BEL successfully converted the adversity into an opportunity. BEL could find out alternatives for many of the US components and, in many cases, source it at lower prices.

1.41 To address the issue of sourcing of non-US components, BEL started its second overseas office at Singapore. BEL Regional Office at Singapore started its operation from 1998. It is involved in sourcing of

components from Japanese, Taiwanese, Chinese and other Asian sources. This has helped BEL to create second source for sourcing of imported components in addition to New York. There is cost advantage in sourcing of components through this office also. In addition to sourcing, this office is also used for developing business for our BEL products.

1.42 During this decade, BEL added many new products like Reporter Radar, Upgrade Flycatcher Radar, Battle Field Surveillance Radar – Medium Range, Battle Field Surveillance Radar- Short Range, EW Systems for Army, Navy and Air Force, Hand Held Thermal Imagers, Integrated Observation Equipment, VHF Radios, Radio Relays, Solar Products and Solar Power Systems, Compact Vacuum Interrupters, Gunner's Main Sight etc. BEL successfully executed APNET on Build, Own, Operate and Transfer model to the Government of Andhra Pradesh. This was for the first time, a project of this nature was undertaken. BEL also executed POLNET project (Police Network project) connecting all the police stations in the country via satellite.

1.43 During this decade, globalisation started the entry of private and foreign companies into Defence Sector. Kelkar Committee's recommendations leading to Defence Procurement Procedures (DPP) paved the way for private sector participation in Defence Sector. BEL geared up to face this competitive market scenario and planned strategies to convert the perceived threats to opportunities. The competition helped BEL to improve itself and has been successful to face the challenges of new emerging market forces.

1.44 During this decade, BEL entered into two more Joint Ventures with General Electric of USA and Multitone of UK. The Joint Venture with GE was for the manufacture of X-Ray Tubes for Medical Electronics and with Multitone for marketing of Pagers. The Joint Venture with GE is performing well and has been paying dividend regularly. As the pager market did not pick up in India, the Multitone joint venture is in the process of winding up.

1.45 In order to give better customer focus, Bangalore Unit was converted into six Strategic Business Units, with each SBU having clear focus on its product range and customers. This has helped Bangalore Unit to address the product/customer issue very effectively. The six SBUs are Military Radar, Naval Systems, Military Communication & Electronic Warfare Systems, Components, Export Manufacturing, Telecom & Broadcast Systems.

1.46 During the decade, R&D has matured and R&D set up has been restructured into a 3-layer organization to meet the needs of the customers effectively and efficiently.

— Development & Engineering (D&E) groups in each of the 9 Units and 6 SBUs developing new products.

— Central D&E at Bangalore developing specialized technology modules for Unit D&E.

— 2 Central Research Laboratories (CRL) at Bangalore & Ghaziabad for carrying out research in futuristic technology areas.

1.47 The objective of this set up is identification and realization of enabling/cutting edge technologies for core business areas.

1.48 Today, BEL spends around 4-5% of its turnover on R&D and the returns from R&D is very significant as nearly 75% of BEL's turnover comes from indigenous R&D , both through in-house development and development through DRDO Labs.

1.49 The company has received the following patent rights:

- Electronic Voting Machine (EVM)
- Solar Traffic Signalling System
- Phase Taping Technique for Beam Shaping of Cellular Base Station Antenna
- Non-symmetric Surface Acoustic Wave Filter

In respect of EVM, patent right is obtained in Singapore and Namibia also.

1.50 BEL introduced '60a' concept, a powerful statistical quality tool in the company during 1998. GE who is a leading practitioner of this '60' methodology trained our Senior Executives. Today, more than 400 executives have been trained and all the Units of BEL have adopted this philosophy for Quality improvement.

1.51 Another Quality initiative which was taken up by the company is the CII Exim Bank Excellence Model for all-round excellence in the company. All the Units of BEL have adopted and are practicing this methodology in their working. Six of our Units have been awarded certificates of merit for strong commitment to Quality.

1.52 The performance of the company during this decade is as follows:

Parameter	94-95	95-96	96-97	97-98	98-99	99-2000
1	2	3	4	5	6	7
Sales	934.61	1068.98	1226.24	1261.30	1198.87	1494.15
PBT	15.80	23.97	95.67	102.34	70.21	166.43

1	2	3	4	5	6	7
Equity	80	80	80	80	80	80
Dividend	16%	16%	20%	20%	20%	25%
Parameter	00-01	01-02	02-03	03-04	04-05	05-06
Sales	1715.33	1941.99	2508.02	2798.59	3212.09	3535.99
PBT	219.91	284.73	386.16	469.02	685.96	855.26
Equity	80	80	80	80	80	80
Dividend	40%	50%	70%	100%	112%	146%

1.53 Though supplies to Defence constitute a majority share in BEL's turnover, BEL realises that, to grow in the year to come, it has to diversify into other areas. BEL is continuously upgrading its technologies and introducing new products, every year, in its efforts to be the leader in professional electronics. Some of the major areas of diversification are as under:—

(a) Satellite Based Systems

(b) Networking Solutions

(c) Smart Card Based Access Systems

(d) Home Land Security Solutions

(e) Solar Photovolatic Systems

(f) Compact Vacuum Interrupters

(g) Set Top Box for DTH

(h) Asynchronous Digital Subscriber Line (ADSL2) Modem

(i) Airport Surveillance Radars

(j) Broadcast Transmitters

Difficulties/Challenges Faced

1.54 The biggest challenge the company had to face ever since its inception was the regime of sanctions by U.S. Government and passive sanctions imposed by some of the European countries. This resulted in non-receipt of components/subsystems for its various manufacturing programmes. The company had to initiate several actions like finding out alternatives, design changes, indigenisation etc. to counter this threat. The company was successful in its endeavour and the results

of the company in its succeeding years speak for itself. The company converted this threat into an opportunity and came out quite successfully. The manufacture of Black & White TV Glass shells at Taloja Unit had to be discontinued on account of diminishing market for Black & White TV sets in the country. BEL took steps to diversify the Unit's product range by creating manufacturing facility for Antennas used in Radars, Electronic assembles, Hydraulics for Tanks and Shelter facilities. This unit had to be converted into a support Unit for all other Units of BEL. Today, this Unit is in the process of identifying products of its own and is in the process of diversification. During this decade, BEL took over the Joint Venture company *viz*., BEDELFT wherein the JV partner M/s Delft did not show much interest and wanted to withdrawn from its operations. This JV company has now become a subsidiary company *viz*, BEL Optronics Devices Limited. This subsidiary company is in the process of acquiring technology for manufacture of Super Gen Tubes. The company also realized that business is slowly shifting from equipment-oriented concept to the customer demanding a total turnkey solution. To address this scenario, the company had to create a system division for this purpose. Today, the biggest challenge faced by the company is to attract and retain skilled manpower. This is mainly on account of poor wage structure in Public Sectors and inability to match the wage structure of private companies. The company has taken steps to implement incentive schemes for Executives and is also in the process of evolving a better wage package in order to retain and attract talent.

CHAPTER II

ORGANISATIONAL STRUCTURE

Board of Directorate of BEL

2.1 Board of Directors of BEL comprises of Chairman and Managing Director and Director In-charge of Finance, Research & Development, Personnel, Marketing, Other Units and Bangalore Complex. The Board of Directors also includes part time Government Directors *i.e.* Joint Secretary (Shipyards) of the Ministry of Defence and two representatives of Armed Forces. Besides, it has 09 part time independent Directors. Two senior most Officers from Air Force and Navy are the permanent specially invitees to all the Board meetings. The Committee observe that Army has not been given representation in the Board of Directors of BEL although it supplies majority of equipment to Army.

2.2 When asked whether the Board of Directors is sufficiently empowered to take professional/business decisions and the powers required to be conferred on the Board to make the company a truly professionally managed entity, the Ministry of Defence in their written replies stated :—

> "Being a Mini Ratna company, sufficient powers have been extended to the Board of Directors to take professional / business decisions, including powers to enter into Joint Ventures / Co-development and Co-production agreements. Some of the powers are:
>
> (a) Capital expenditure upto Rs 500 crores or Net worth, whichever is less.
>
> (b) Equity investment in Joint Ventures and subsidiaries or mergers and acquisitions in India upto 15% of the net worth or Rs. 500 crores in one project. Overall ceiling in all JVs and subsidiaries or mergers and acquisitions upto 30% of the networth.
>
> (c) Opening of offices abroad with the concurrence of the administrative ministry.
>
> Further, with the restructuring of the Board of Directors of the company to include various technical and management experts

from leading Business Institutions, IISc, IITs etc., the company is managed in a highly professional manner.

Additional Powers required to be conferred on the Board to make the company a truly professionally managed entity."

2.3 On being asked, about the future plan to restructure the Board of Directors in case of elevation to Navaratna status, the Ministry in its written replies stated:—

"BEL Board of Directors was restructured last on 7th March, 2006 (Ref. GoI/MoD letter No. 19(2)/2005/D(BLE) dated 7th March 2006 to comply with the SEBI requirements for listed companies.

In accordance with the SEBI requirement that not less than 50% of the listed Company's Board should consist of Independent Directors, the BEL Board was restructured on 7.3.2006 and 9 part-time non-official Directors (independent Directors) were inducted on 23.5.2006 for a period of three years. Thus, more than 1/3rd of the members in the Board are part-time non-official Directors in accordance with stipulations for Navaratna PSEs. Hence, BEL is not required to plan further restructuring of the Board on elevation to the status of Navaratna PSE."

Restructuring of units

2.4 The Company has nine manufacturing units located at Bangalore, Ghaziabad, Pune, Panchkula, Kotdwara, Hyderabad, Machilipatnam, Chennai and Navi Mumbai. Each of the Units is working in specific business areas as given below:—

Unit	Major Products
1	2
Bangalore	Military Communication & Electronic Warfare Systems, Radars, Naval Systems and Sonars, CI Systems, Simulators, Sound & Vision Broadcast Equipment, Electronic Voting Machines, Simulators and Components
Ghaziabad	Radars & Micro Wave Communication Equipment, Antennas
Pune	Batteries, X-ray Tubes, Electro Optics, Laser Range Finders & Target Designators

1	2
Machilipatnam	Night Vision Devices, Thermal Imagers and Surgical Microscopes
Panchkula	Military Communication Equipment
Kotdwara	Defence Communication Equipment and Telecom Products for Civil & Defence
Navi Mumbai	Hydraulics for Stabilisers, Shelters, Mast, Flycatcher Antenna System
Chennai	Tank Electronics, Stabiliser Drives, Advanced Land Navigation Systems, Integrated Fire Control Systems, Gun Upgrades
Hyderabad	Electronic Warfare Equipment

2.5 All the above nine factories are certified for ISO 9001:2000 ISO 14001:2004. In addition, BEL has Regional Offices and Marketing Centres at New Delhi, Kolkata, Mumbai, Chennai, Hyderabad and Vishakapatnam to provide support to the units and customers. The Company has set up two Overseas Offices in New York & Singapore for cost effective sourcing of components and sub-assemblies.

2.6 Pertaining to the organizational structure of BEL, the Ministry of Defence in a written note stated as under:—

> "Under the liberalized business environment, increased global competition and rapid technology changes, it has become imperative for the company to evolve an organizational structure to effectively respond to the dynamic conditions of the environment. As a step towards achieving enhanced business performance, increased customer satisfaction, faster response time, the biggest unit of BEL at Bangalore Complex was divided into six Strategic Business Units with clear products/business focus on major business segments like.
>
> - Military Radar
> - Naval Systems
> - Military Communication & Electronic Warfare
> - Civil Telecom & Broadcast System
> - Components
> - Export Manufacturing

BEL is now in the process of restructuring its second largest Unit at Ghaziabad into two Strategic Business Units."

2.7 Pertaining to other seven units of BEL, it has been observed that no action has been started to restructure on the line of Bangalore and Ghaziabad Units with clear-cut focus on their different business segments.

Recommendation No. 1

Restructuring of the Board of Directors

2.8 The Committee note that the Board of Directors of BEL comprises Chairman and Managing Director, six Directors incharge of Finance, Research and Development, Personnel, Marketing, Other Units and Bangalore Complex respectively. The Board of Directors also includes part time Government Directors *i.e.* Joint Secretary (Shipyards) of the Ministry of Defence and two representatives of Armed Forces. In accordance with the SEBI guidelines, BEL has restructured its Board of Directors and has included part time independent Directors and has also included various technical and management experts from leading business institutions and IITs. Two senior most Officers from Air Force and Navy are the permanent special invitees to all the Board meetings. The Committee feel that the restructuring of the Board of Directors is a positive step to manage the Company in a professional manner. However, the Committee note that Army has not been given representation on the Board of Directors of BEL and only making the representatives of the Armed Forces as permanent special invitees will not serve any meaningful purpose. Therefore, the Committee desire that officers from Army, Navy and Air Force should be made permanent Members on the Board of Directors instead of designating them as permanent special invitees to all the Board meetings. This will ensure active and effective participation of the users in the projects from the conceptualization stage to production and user will help BEL to take decision in a more concerted way.

Recommendation No. 2

Need for organizational restructure in all the nine units of BEL

2.9 The Committee note that BEL has nine manufacturing units located at Bangalore, Ghaziabad, Pune, Punchkula, Kotdwara, Hyderbad, Machilipatnam, Chennai and Navi Mumbai. The Committee observe that BEL has restructured its biggest unit at Bangalore Complex into six Strategic Business Units and is now in

the process of restructuring its second largest unit at Ghaziabad in order to achieve enhanced business performance, increased customer satisfaction and faster response. The Committee note that the BEL has not initiated any action to restructure the other units in the line of Bangalore and Ghaziabad units. Therefore, the Committee desire that the Ministry of Defence should appoint a Committee to examine the restructuring of the other units to enable them to meet the requirements of rapid technological changes in the liberalized business environment.

Recommendation No. 3

Need for conferring additional power to the Board of Directors

2.10 The Committee observe that being a mini Ratna Company, some powers have been extended to the Board of Directors to take Professional/business decisions, including powers to enter into joint ventures/co-development and co-production agreements. BEL's Board of Directors was restructured on 7 March, 2006 to comply with the SEBI requirements for listed companies. In accordance with the SEBI stipulation for Navaratna Public Sector Enterprises (PSEs), BEL has included one-third of the Members as a part time non-official Directors and has included various technical and management experts and the users.

In view of the recent restructuring, the Committee feel that additional powers may be conferred on the Board to make the company a truly professionally managed entity, to enable it to take independent decisions on project sanction, joint ventures with private sector and R&D etc.

CHAPTER III

NAVRATNA STATUS TO BEL

3.1 Based on the MoU performance, the company has been rated in the "Excellent" category continuously for the last 8 years by the Department of Public Enterprises (DPEs) and was conferred the status of "Mini Ratna" by the Department of Public Enterprises (DPE) during the year 2001. All the nine factories are certified for ISO 9001:2000 ISO 14001:2004.

3.2 In the supplementary written replies the Ministry has stated the following benefits the BEL is going to achieve if Navratna Status will be accorded to it.

(a) Capital Expenditure: As a Navratna the PSE can incur capital expenditure on purchase of new items or for replacement, without any monetary ceiling (as against the monetary ceiling of upto Rs. 500 crores as Miniratna);

(b) To establish financial Joint Ventures/Subsidiaries: Maximum Permissible equity investment by a Navratna PSE is Rs. 1000 crores in India & Abroad (as against Rs. 500 crores in India by a Miniratna PSE);

(c) To establish offices abroad: Full powers as Navratna PSE (as against with the concurrence of Administrative Ministry in the case of Miniratna);

(d) Creation of posts: Navratna PSE can create and wind up posts including and upto those of non-Board level Directors, *i.e.* Functional Directors who may have the same pay scales as that of Board level Directors, but who would not be members of the Board, Power includes appointment to these posts and internal transfers, redesignation of posts. Miniratna PSE can create posts below Board level scales only.

(e) Raising debts: Navratna PSEs have been delegated with powers to raise debt from the domestic capital markets and for borrowings from international market, subject to the approval of RBI/Deptt. of Economic Affairs, to be obtained through Administrative Ministry. No such specific delegation of powers to Ministry. No such specific delegation of powers to Miniratna PSE.

Recommendation No. 4

Navaratna status for BEL

3.3 The Committee observe that BEL has been rated as an "Excellent" Public Sector Undertaking for the last 8 years by the Department of Public Enterprises (DPE) and was conferred the status of Mini Ratna by the DPE during the year 2001. All the above nine factories are certified for ISO 9001:2000 ISO 14001:2004. The Committee also note the benefits of conferring Nava Ratna status to BEL, as this status will *inter alia* remove monetary ceiling for incurring capital expenditure on purchase of new items or for replacement to establish financial joint ventures/subsidiaries with a maximum permissible equity investment of Rs. 1,000 crore in India and abroad, full power to the PSE to establish Offices abroad without the concurrence of Administrative Ministry, giving free hands to the PSE in creating and wind up of post *i.e.* functional Directors and internal transfers and re-designation of posts and delegation of power to raise debt from the domestic capital markets and for borrowings from international market subject to the approval of RBI/Department of Economic Affairs.

In view of the above benefits of Nava Ratna Status and the performance of BEL, the Committee strongly feel that BEL should be elevated to Nav Ratna Status to make it truly professional body.

CHAPTER IV

PERFORMANCE & CAPACITY UTILIZATION

(i) Core area of business

4.1 BEL has more than 350 products in its product range. All these products can be broadly classified under the following core business groups:—

- Radars and Sonars
- Communication
- Electronic Warfare Systems
- Electro Optics
- Tank Electronics
- Telecommunication and Broadcasting
- Components
- Turnkey Solutions

Customer's profile

4.2 The customer profile of BEL can be broadly classified into two groups *viz*., Defence & Non-Defence (Civil). While the Army, Navy & Air Force constitute the Defence Services, other customers like Defence Public Sector Undertakings *viz*., HVF, Avadi, Medak, the three Shipbuilding Companies *viz*., Mazagon Dock Limited, Garden Reach Shipbuilding and Engineers, Goa Shipyard Limited, Bharat Dynamics Limited etc procure items from BEL for incorporation in the systems *viz*., Tanks/Ships manufactured by them for eventual supply to Defence Services. Apart from this, Paramilitary Forces like Border Security Force, Assam Rifles, Central Industrial Security Forces etc also procure items from BEL.

4.3 On an average, more than 80% of BEL's turnover is for the Defence Services and BEL's contributions to the Services in their various programmes like Plan AREN & PMO BSS for Army, Plan ADGES for Air Force and Navy's modernisation programmes have been very significant. Today, BEL meets a variety of requirements of the Services in the areas of Radars, Sonars, Communication Equipment and Systems,

SATCOM, Tank Electronics, Electronic Warfare Equipment, Command Control Systems etc., meeting stringent Defence specifications with the assurance of lifetime product support. R&D engineers also associate with the projects being acquired through transfer of technology from foreign countries to support documentation initially & to give product support & Indigenisation activities. The products supplied to Defence Customers are given in **Annexure-I**.

4.4 The Non-Defence (Civil)customers include All India Radio & Doordarshan and Bharat Sanchar Nigam Limited (BSNL) emerge as major customers. Other civilian customers include Airports Authority of India, Indian Space Research Organisation, Railways, Election Commission of India etc. Manufacturers of Consumer Electronic goods like Radio, TV & other products constitute the customer profile for components.

4.5 During the briefing before the Committee the representatives of the Ministry of Defence has stated the following in regard to civil market :—

> "BEL has been trying to make a foray into the civil market and in its diversified business efforts it has developed several products for civil market like Satellite Communication systems, X-Ray baggage machines, solar photovoltaic systems, compact vacuum interrupters, set top box for DTH, etc. However the production of the civilian market in its total revenue is 15 per cent.
>
> Very recently, against very stiff competition, BEL has won a contract for the supply, integration, annual maintenance and facility management of the state-of-the-art call data record based convergent billing system for MTNL in Delhi and Mumbai. The company has also obtained an order from the Army for Rs. 126 crore to set up a test bed for CDMA-based communication network. The Company also bagged a contract for Rs. 4.3 crore to set up a satellite communication network in Nigeria."

4.6 During oral evidence, when pointed out that 13 per cent of turn over of BEL comes from PSUs like MTNL, BSNL and Airports Authority of India etc. Although, BEL is trying to reach civilian market it is observed that only 2 to 3 per cent turnover comes from civil market other than the above organizations. When asked whether BEL is planning to bring any changes to enter into other new civil markets, the CMD, BEL stated:—

> "When we say civil market, it is non-defence. Even though MTNL and BSNL and AIR are buying the products, it is against global competition. When we did supply the photovoltaic solar systems or broadcast systems for Prasar Bharati or telecom systems for MTNL and BSNL, it was against competition. I fully agree with hon. Member's observation that last year, our supplies were

85 per cent to the defence and 15 per cent to the civil, but this year it is likely to be 20 per cent to the civil and 80 per cent to the defence. But our effort is to identify and diversify in new areas of civil business so that we try to maintain 20:80 in the future years also."

4.7 When asked about the steps taken or proposed to be taken by BEL to enter into civil market in order to identify and diversify the new areas of civil business, the Ministry in their written replies to the post briefing List of Points has stated:—

"BEL has identified the following areas to expand business in the civilian market. The areas of diversification are:

(i) Systems/Products
(ii) Satellite Based Systems
(iii) Networking Solutions
(iv) Smart Card Based Access Systems
(v) Home Land Security Products
(vi) Railway Systems
(vii) e-Governance
(viii) Solar Photovoltaic Systems
(ix) Compact Vacuum Interrupters
(x) Broadband Modem
(xi) Airport Surveillance Radars
(xii) Broadcast Transmitters
(xiii) Contract Manufacturing."

4.8 The products supplied to non-Defence civil Customers are given in **Annexure-II**.

4.9 The following table shows the percentage of turnover in respect of Defence and Civil Business of BEL during the last five years:—

Years	Defence	Civil	Total Turnover (Rs. in crore)
2001-02	72	28	1942
2002-03	80	20	2508
2003-04	77	23	2799
2004-05	88	12	3212
2005-06	86	14	3536

4.10 The Standing Committee on Defence in their Ninth Report on Defence Public Sector Undertakings had recommended that while meeting the demand of civilian sector, priority should always be given to the Defence Sector. In response to this, the Ministry of Defence in their Action Taken Replies has stated that BEL continues to give priority to the Defence Sector.

(ii) Diversification

4.11 Though supplies of Defence constitute a majority share in BEL's turnover, BEL realizes that, to grow in the years to come, it has to diversify into other areas. Some of the major areas of diversification are as under:—

Systems/products

- Satellite Based Systems
- Networking Solutions
- Smart Card based Access Systems
- Home Land Security Solutions
- Solar Photovoltaic Systems
- Compact Vacuum Interrupters
- Set Top Box for DTH
- Asynchronous Digital Subscriber Line (ADSL 2+) Modem
- Airport Surveillance Radars
- Broadcast Transmitters

4.12 In regard to the strategy formulated by BEL in consultation with the Ministry to increase the clientele of BEL particularly in civil side in order to earn more revenue, the Ministry in their written reply stated:—

"BEL has developed a good number of products for the civilian sector to increase the revenue. BEL has sought the help of MoD to facilitate BEL to make presentation to various Government agencies. Some of the products for which BEL had made presentation are:—

X-Ray Baggage inspection system	—	Commerce Ministry, MHA, Surface Transport Ministry
Multi Purpose National Identity Card	—	MHA

POLNET	—	MHA
e-Governance Project	—	Various State Government
Edusat	—	Department of Space

BEL has been addressing markets other than the Defence and focusing on diversifying into certain areas of civilian electronic products like SATCOM equipment, Airport Surveillance Radars, Electronic Voting Machines, Solar Photovoltaic Systems (Traffic Lights, Power Plants), Vacuum Interrupters, Set Top Box, Multipurpose National Identity Card (MNIC) project, Simputer, Smart Card Systems etc. BEL has executed SATCOM network for Andhra Pradesh Government and SATCOM network for Police network for the entire country. BEL is in the process of executing Convergent Billing project for MTNL and Wide Area Network for Cabinet Secretariat. BEL has also set up a Systems Strategic Business Unit to explore and address the civilian market."

4.13 The present status of the diversification of some of the major products as submitted by the Ministry are given below :—

1. Set Top Box (STB): BEL has developed three types of STBs for different market segment. The Direct-to-Home (DTH) Free To Air (FTA) STB is being marketed through its various marketing centres. This STB can be used to receive Doordarshan's channels. There is a huge potential for this business segment once Conditional Access System (CAS) is implemented throughout the country. BEL is also trying to export STBs to other countries.
2. e-Governance Project: BEL has given presentations to some of the State Governments on e-Governance Projects like State Wide Area Network (SWAN), Document Control and Cyber Security Systems. BEL is pursuing to get orders for these projects.
3. Homeland Security Project: BEL has a wide range of products like Perimeter Security, Sensors, X-ray Baggage Inspection Systems. BEL is quoting for various tenders floated by Paramilitary Forces, Defence and other Government Agencies.
4. Compact Vacuum Interrupters: These miniature tubes developed indigenously have got good market potential and are being used by the Power Sector Industries. These tubes are also exported to countries like Malaysia, Dubai, Turkey, Uganda, UK etc.

5. Solar Systems: BEL is executing a good number of Solar related orders for State Governments like Assam, Manipur, Rajasthan, Uttaranchal, Gujarat, Karnataka etc. The solar systems include Solar Traffic Signals, Solar Power Plants, Solar Lighting Systems, Solar Lamps etc.

   In addition to the market in India, BEL is also trying to export Solar Systems to foreign countries like Suriname, Guyana, Trinidad and Tobago, Yemen, Turkey etc.

6. Contract Manufacturing: BEL is exporting electromechanical parts to General Electric, USA for medical applications since last seven years. BEL is also exploring the possibility of exporting similar kind of electromechanical parts for other companies like Siemens, Varian, Philips etc. Apart from this, BEL also takes up Contact Manufacturing on Build to Print and Build to Specs basis."

(iii) Available infrastructure and their upgradation

4.14 BEL has been continuously modernizing its infrastructure to be in tune with the changing needs of the technology / products. On an average the company has been spending more than Rs. 100 crores on capital investment in creation of modern facilities in all its Units. The expenditure on infrastructure is met wholly through the internal accruals of the company and in the coming years the expenditure on modernisation of infrastructure is expected to double.

4.15 The Ministry in a written reply has furnished the following details in regard to infrastructure established in various Units :

Sl.No.	Projects Established/ To be established	Status	Date of Completion/ Expected Date of Completion	Remarks
1	2	3	4	5
1.	Setting up of Near Field Test Facility to develop and manufacture state-of-the-art phased array antennae.	Completed	Mar. 2006	
2.	Setting up of Manufacturing Test Facility for SRE	Completed	Dec. 2006	
3.	Augmentation of Facility for Manufacture of Space Grade Receivers.	Completed	Jan. 2005	

1	2	3	4	5
4.	Mass Manufacturing Facility for assembly of electronic circuit boards using surface mount devices.	Completed	Jul. 2004	
5.	Setting up of test facility, Turret Stand for manufacture of Stabilizer and Automatic Loading Gear for T 90 S Tanks at an estimated cost of Rs. 18.12 crores.	In Progress	Dec. 2007	This facility is required for the indigenous manufacture of 100 Nos. of T90 S tanks by HVF Avadi, for which BEL has to supply stabilizers and Auto Loading Gear. Turret test stands for checking the stabilizer system are required to be imported from Rosoboronexport Russia, and hence the completion of the project is dependent on supplies from them.
6.	Augmentation of IT Infrastructure – Enterprise Resource Planning (ERP) at an estimated cost of Rs. 37.51 crores	In Progress	June 2008	Implementation in all the units and offices will be in place by October 07 and this will be used. However, additional features such as Customer Relationship Management, Supplier Relationship Management/ Supply Chain Management and other modules such as Strategic Enterprise Management and Business Information Warehouse will be added by June 2008
7.	Manufacturing facility for co-production of Micro Wave Assembly for TARANG MK IB for producing super components for use in Electronic Warfare Equipment	Completed Dec. 2006		

1	2	3	4	5
8.	Upgradation of Shelter Manufacturing Facility to produce state-of-the-art shelters required for Defence Forces at a cost of Rs. 6.60 crores	In progress	Jan. 2007	The major equipments required for the facility have been received and are under installation. The facility is expected to be in place by January 2007.
9.	Expansion of Capacity for Vacuum Interrupters from 25000 Nos. to 50000 Nos. at an estimated Capital Investment of Rs. 16 Crs.	In progress	Mar 2007	Enhancement in capacity from 25000 Nos to 35000 Nos. has been completed Capacity enhancement from 35000 to 50000 is expected to be completed by Mar 07.

4.16 The Committee are informed that some of the new infrastructure are in the process of establishment in various units of BEL. The facilities so created will help in improving the process of manufacture and these in turn improve the efficiency of manufacture and productivity. This also adds versatility in Units to handle different kinds of related jobs. When asked to explain about the modernisation and diversification programme being hampered due to lack of these infrastructure the Ministry in its supplementary replies has stated that:

> "The projects are proactively taken up for modernisation & diversification needs of the business. Some of the projects have been completed and are being utilized for the intended purpose. Balance projects are progressing as scheduled. Since these projects are proactively taken up, programs are not hampered. No constraints are being faced by BEL in establishing these infrastructure projects".

(iv) Utilisation

4.17 The Committee are informed that BELs aims to ensure that all the Units are fully loaded in order to maximize the capacity utilization. In this regard, the company shifts products/services from one Unit to another Unit in order to utilize the available (surplus capacities). Products are shifted from one Unit to other when the receiving Unit has the capability and infrastructure to manufacture the equipment without any difficulty. Thus the Units of BEL are geared up to take up different kinds of jobs, other than their own products. By doing so, they also acquire versatility in their manufacturing capabilities.

4.18 In spite of adjusting/shifting the loads from one Unit to other Unit, it may not be possible to fully utilize the capacities. Around 60-70% of the capacities of the Units are utilized. In order to increase the utilization, Units are engaged in diversifying into new product lines and businesses, taking up turnkey project solutions like Convergent Billing, e-Governance projects etc.

4.19 When asked about the reasons for under utilization of capacities of some of the units and steps taken by BEL to overcome the difficulties and measures taken for hundred percent capacity utilisation of these units, the Ministry in its supplementary replies stated:

> "The Units which are awaiting orders to be received and executed during the year are Bangalore, Ghaziabad, Machilipatnam, Panchkula & Kotdwara. BEL has been taking it up with Ministry for early placement of orders to utilize the facilities and, in many cases, the company in anticipation of order takes up advance production activity. This not only helps in utilizing the facilities, but also helps in meeting the urgent needs of the customers."

4.20 Bangalore Unit is waiting for STARS 'V' FH, Radio Trunking System (RTS), Mk II, Upgraded Flycatcher Radar, Battle Field Surveillance Radar (Short Range), PRC 6020, Intelligent Message Terminal (IMT), VPS Mk III, Ghaziabad Unit is waiting for order for Battlefield Surveillance System (BSS) SANJAY, Machilipatnam Unit waits order for hand Held Thermal Imager (HHTI), Night Vision Devices, Kotdwara unit waits order SRAX Mk II and Panchkula Unit is waiting order for STARS 'V' FH, VPS Mk III, Combat Net Radio (NCR).

4.21 BEL has taken the following steps for hundred percent capacity utilization:-

> "BEL has been taking up with the Ministry for early placement of orders to utilize the facilities. These orders cover the supplies of the order of Rs. 712 crores during the year 2006-07.
>
> In the above projects, the projects like STARTS 'V' FH, RTS Mk II, SHAKTI, SANJAY, SRAX Mk II are going to be inducted for the first time in the Services. These products have undergone extensive trials and evaluation and are ready for induction. The above projects are under various stages of ordering by MoD. RFP expected shortly for Upgraded Flycatcher Radar, partial Upgrade of Flycatcher, PRC 6020. CNC completed and order is awaited for HHTI & BFSR – SR.

The company assigns products / services to Units so as to utilize the available capacities to maximize capacity utilization. Apart from this, company is also working on diversification areas to generate business in the newer areas of Total Solutions, Homeland Security Systems, e-Governance etc."

(v) Order book position

4.22 During the study visit of the Committee to BEL, Bangalore, they were informed that :—

"Order Position is a matter of concern as the yearly dispatches are increasing every year but order book is not proportionately increasing. For the year 2006-07, the dispatch plan is Rs. 4200 crores and order book as on 1st April 2006 is Rs. 6633 crores, out of which executable orders is only Rs. 3541 crores. With this, there is a gap of about Rs. 700 crores between the available executable orders and the dispatch target for the current year. Some of the SBUs/ Units *viz*., Military Communication & Electronic Warfare (MC &EW) SBU of Bangalore Complex, Panchkula, Kotdwara and Pune Units are not fully loaded. These Units are to get additional orders and execute the same during the year."

4.23 The Committee were further informed that:

"During the 10th Plan period (2002-2003 to 2006-07) till 1st October 2006, BEL has received a total of Rs. 12596 Crores orders from Defence. The year-wise details of order receipt are given below:

Year	Defence Orders received (Rs. Crores)
2002-03	4548
2003-04	2018
2004-05	2175
2005-06	3021
Total	11762
2006-07*	834

*upto 1st October 2006, further orders are expected

(iii) Delivery schedule

4.24 The year-wise supply status is given below :—

Year	No. of Indents	Indents Supplies in time		Indents Delayed			
				Less than 6 months		Greater than 6 onths	
		Nos.	%	Nos.	%	Nos.	%
2002-03	41	24	58	8	20	9	22
2003-04	25	16	62	6	23	3	15
2004-05	26	19	73	3	12	4	16
2005-06	10+20*	8	80	2	20	0	0
Total	102+29*	67	66	19	19	16	15
2006-07*	17						

*Out of 39 indents received in 2005-06, 10 were planned in 2005-06. Out of balance 29, 19 indents are planned for completion during 2006-07 and 10 will be supplied in the coming years as per delivery schedule.

4.25 The details of equipment, indent date, order quantity, order value, delivery date, actual delay and reasons for delay are as given in the following tables :-

Projects which got delayed—less than 6 months

Sl.	Equipment	Indent Date	Order Qty.	Order Value (Rs. Lakhs)	Delivery Date (Original)	Actual Delay (in months)	Reasons
1	2	3	4	5	6	7	8
1.	IOE	04.10.05	129	7335	04.10.06	5	40 Nos. supplied in Nov. 2006 and balance will be completed by Mar 2007. Delay is due to user evaluation of GPS.
2.	RRF	08.10.02	1322	31656	12.05.04	4	Delay in supply of ECCM by collaborator.
3.	RRF LB	28.03.03	421	10536	27.06.04	4	338 Nos. supplied in time. Only 83 Nos. delayed by 4 months on account of indepth manufacturing.

1	2	3	4	5	6	7	8
4.	PRC 6020	17.03.03	1520	19624	30.06.04	3	1147 Nos. supplied in time. Only 1373 Nos. delayed by 3 months on account of late receipt of imported material.
5.	PRC 6020	17.03.03	1000	12909	30.06.04	3	
6.	CNR	29.03.05	500	3400	28.12.05	3	Due to trials & evaluation.
7.	ULSB Mk II	31.03.03	934	3135	31.12.03	1	Delay is on account of failure of vendor supplied item.
8.	HHTI	29.03.04	232	4587	31.05.05	1	Due to late receipt of core kits from OEMs.
9.	HHTI	21.01.03	1188	25998	21.03.05	1	Due to late receipt of core kits from OEMs.
10.	HHTI	02.04.04	200	3627	31.05.05	1	Due to late receipt of core kits from OEMs.
11.	VCS Mk – II 637	03.04.03	1	1082	30.09.06		Delayed. To be supplied. Revised delivery date : March 2007.
12.	SONOBUOY	18.09.02	1220	1464	07.01.03	1	Due to logistic problem from supplier end.
13.	PRIME	26.03.03	605	1430	31.12.03	1	Delay in transportation.
14.	RASHMI 3014-16	13.12.02	3 Sets	552	30.04.06	3	Main equipments supplied. Only spare items pending.
15.	CCS Mk-II	13.12.03	1 Set	500	31.12.03	3	Delay in receipt of imported items.
16.	CCS Mk-III	24.03.04	3	3549	30.09.06		Delayed. 1 Main equipment supplied. Revised delivery date: 31 March 2007.

1	2	3	4	5	6	7	8
17.	R 173	06.06.03	80	664	31.12.03	1	Delay in receipt of imported items.
18.	R173	19.09.03	122	703	31.03.04	3	Delay in receipt of imported items.
19.	CDMA NETWORKS	24.10.05	MSC + 50	8712	23.10.06		Change in scope of work – site related issues. Revised delivery date : 15 Feb 2007.
20.	T 72 STAB SPARES	15.06.04	LOT	644	14.06.05	6	Delay in receipt of imported items.
21.	FLYCATCHER RADAR	29.03.03	16	25761	31.03.05	16	Due to US sanction and obsolescence of items.
22.	ELLORA	25.03.04	4	26200	30.12.05	15	Delay is due to completion of evaluation and consequent modification of final system. 2 Nos. supplied so far.
23.	HHTI	09.08.02	1022	25998	09.06.03	7	972 Nos. supplied in time. 50 Nos. delayed on account of indigenisation and indepth manufacturing.
24.	PNS 84 RIFLE	24.02.03	2675	748	06.08.05	13	Clearance of sample delayed the supply.
25.	SAMYUKTA COM	25.09.02	3CC Blocks	42541	30.11.05	24	2 CC Blocks supply completed. Being major EQ programme, productionised first time under concurrent design and engineering concept. Delivery programme extended upto November 2007.

1	2	3	4	5	6	7	8
26.	SAMYUKTA NON COM	07.03.05	2CC Blocks	43085	30.10.06	13	2 CC Blocks pending. Will be supplied as per revised delivery schedule. Being major EW programme, productionised first time under concurrent design and engineering concept. Delivery programme extended upto November 2007.
27.	HOMI	04.10.02	5	4820	31.12.04	25	Flight trials of first system was completed only in Jan. 2005 on account of non-availability/ modification of aircraft. In view of this, delivery of other systems rescheduled. 4 Nos. completed.
28.	SHAKTI (UACCCS)	27.06.02	1	3650	26.09.03	18	Software testing, integration and site trials delayed.
29.	AERV	07.01.03	8	1428	30.11.03		This order consists of fitment and integration of instruments inside BMP II vehicle which is manufactured by Ordnance Factory, Medak under orders from VRDE, Ahmednagar and supplied to BEL. The delivery of the AERV from BEL is done within 3 weeks of receipt of BMP II vehicle from OF,

1	2	3	4	5	6	7	8
							Medak. Till now, 6 Nos. of AERV have been supplied.
30.	VCS Mk-II 617	27.03.03	1 Set	1040	31.03.06		Main equipment supplied. Spare items pending. Revised delivery date : March 2007.
31.	VCS Mk-II 627	03.04.03	1	1048	30.09.05		Main equipment supplied. Spare items pending. Revised delivery date : March 2007.
32.	HUMSA LF	22.01.04	3	3708	22.01.06		Delayed. 1 System is being supplied. Revised delivery date: January 2007.
33.	HUMSA	28.02.03	3 Set	3441	31.12.05		Delayed. To be supplied.
34.	NAMICA	14.12.04	2	500	30.12.05		Design finalisation and receipt of critical parts. To be supplied. Revised delivery date : March 2007.
35.	CTD	30.03.05	10	538	31.03.06	12	8 Nos. supplied. 2 Nos. pending. Revised delivery date : March 2007.

4.26 From the above tables, it has been observed that in case of 20 projects the delay is less than six months. The period varies from one to six months. In case of 15 equipment the delay is more than six months. The period of delays varies from 7 to 25 months.

4.27 BEL has been analyzing the reason for delays in supplies and taking suitable measures. Due to these measures, the percentage of indents completed within delivery dates has gone from 58% in 2002-03 to 66% in 2005-06.

4.28 The major reasons for delays as identified by BEL are given below :—

> "Sourcing problems, Concurrent Engineering, design related issues, Obsolescence, Trials and Evaluation related, Inspection by Customer Agencies, Site Related issues, Delays in transportation to the destination."

4.29 Pertaining to the measures taken to reduce the delay the Ministry of Defence in its written reply has sated –

> "Over the years, BEL has introduced various measures and set up processes to effectively control the timely supplies. These measures are Close monitoring of supply schedules at Division and Unit level, Fixing of quarterly targets for supplies and reviews of achievements, Involvement of BEL engineers at early design stages of project at DRDO labs, Thrust on multi-sourcing of items, Indigenisation of critical single vendor imported items, Close co-ordination agencies.
>
> BEL has got an elaborate quality system, which is followed right from inspection of incoming raw material and components to stage-wise inspection and final inspection of the product both by BEL inspectors and resident inspectors of customer. Utmost care is taken to ensure high quality of the products so that the field level problems are reduced to a greater extent. Sometimes, some problems get reported in the field, which are attended to by BEL team. However, in few cases, some subassemblies/components had failures. BEL undertakes repair of such equipment at no extra cost during warranty either in field or at factory to the full satisfaction of the customer."

(vi) Export Market

4.30 BEL is focusing on export as a major thrust area for growth. Company has set up International Marketing Division exclusively to promote export of equipment & components. Market development activities are being pursued in SAARC countries, South East Asian countries, African Countries, Middle East, Europe, USA, Latin America and CIS countries. To identify the export opportunities BEL interacts closely with MEA, MoD and Indian Embassies in various countries and also participates in important International Exhibitions.

4.31 The product-wise exports of BEL since last six years is as under :—

(Value in Rupees Lakhs)

Sl. No.	Equipment/Systems	2001-02	2002-03	2003-04	2004-05	2005-06
1	2	3	4	5	6	7
(a)	**Communication Equipment** Time Division Modular Exchange (TIDEX) Unit Level Switch Board (ULSB) Secure Telephone (Shruti) Secure Fax Tank Intercom System TDM Simulator for RRF Accessories *viz.*, Duplex Filter Antenna, Antenna Mast	11.54	86.56	19.72	9.78	973.97
(b)	**Radars & Radar Sub-systems** Battle Field Surveillance Radar (BFSR-SR) IFF Mk X with Antenna Refurbishment of Cymbeline Radar & Spares Spares of IFF Mk X Installation and Integration Services for RWR Air Defence System – Skyshield Transmitter sub-system for X-Band Radar 3D Radar TRS 2215 Spares Target Designator Sight (TDS)	848.67	2368.68	1293.90	564.15	1338.06
(c)	**Telecom/Braodcasting/Satcom** 1kW & 500 W FM Transmitter C-Band 20 W SSPA Digital TV Equipment for Earth Station TVRO System & VHF Single Channel Equipment Accessories for FM Transmitter Station *viz.*, TV Demodulator, Digital Stereo Decoder Spares for FM Transmitter Software Support for TV Network	290.42	144.97	39.44	2.09	4.65

1	2	3	4	5	6	7
(d)	**Night Vision Products** Hand Held Thermal Imager (HHTI) and accessories Laser Range Finder LH 30 Night vision Binocular, goggles & Night weapon sight Optical parts *viz*., Objectives, Eye pieces, Lens, Filter, Collimators	149.77	29.14	491.08	470.04	167.23
(e)	**Components** Small Signal Devices, Power Devices ICs, HMCs, Crystals/Crystal Filters Magnetrons X-Ray Tubes Vacuum Interrupter Solar Cells/Modules/Systems MgMnO2 Batteries	1240.44	1371.03	1260.41	3262.70	678.62
(f)	**Contract Manufacturing/Work Packages/Services** Contract Manufacturing Mechanical Parts/Assemblies X-Ray Casings, Magnetics, X-Ray Parts PCB Test Software Development Illustrated Logic Support and Engineering	530.64	795.53	1025.00	1141.42	2928.10
	TOTAL EXPORTS	3071.48	4795.91	4129.55	5450.18	6085.63
	EXPORTS IN MILLION US DOLLARS	6.34	10.16	9.23	12.50	13.70

4.32 From the above table it is observed that the export rate of BEL is very low and inconsistence. In regard to communication equipment, the export growth of BEL varies from Rs. 9.78 to 86.56 from 2001-02 to 2004-05. During the year 2002-03 the value of export of communication equipment was Rs. 86.56 lakhs. It has drastically reduced to Rs. 19.72 lakhs in 2003-04 and further reduced to Rs. 9.78 lakhs in 2004-05. In 2005-06 the value is Rs. 973.97 lakhs. In regard to radars and radar sub-systems, the export value has

drastically reduced to Rs. 564.15 lakhs in 2004-05 from Rs. 2368.68 lakhs in 2002-03. During the year 2005-06 the value is Rs. 1338.06 lakhs. As far as telecom/broadcasting/satcom devices the export value during the year 2001-02 was Rs. 290.42 lakhs. It has drastically reduced to Rs. 144.97 lakhs in 2002-03, Rs. 39.44 lakhs in 2003-04, Rs. 2.09 lakhs in 2004-05 and Rs. 4.65 lakhs in 2005-06 so far as night vision products, the export value during 2002-03 was only Rs. 29.14 lakhs. During the year 2005-06 it has reduced to Rs. 167.23 lakhs from Rs. 470.04 lakhs in 2004-05. In regard to components the export value has drastically reduced to Rs. 673.62 lakhs in 2005-06 from Rs. 3262.70 lakhs in the year 2004-05.

4.33 When asked about the reasons for low exports, the representatives of the Ministry of Defence during oral evidence stated :—

> "The biggest importers of defence equipment, in the world China, India and Pakistan. They are the three top defence equipment buyers in the whole world. Therefore, the entire defence industry in the world is concentrating on these three countries. Therefore, it is not easy for us to sell our products in advanced countries. But still there are some markets like South-East Asia, SAARC countries. African continent, where we are trying to export. We are developing the markets with there. Also, some specific products are being developed for them to meet their requirements. They may not need the state-of-the-art technology that is available in the western world. We are working on improving our exports. Presently, our export is low, but the new offset policy might help us to improve the exports in the coming few years."

4.34 During briefing, the representatives of Ministry of Defence has informed that export potential of BEL is very low *i.e.* 14 million US Dollars only. BEL is trying to tie up with some South-East Asia, SAARC countries and African Continent to export their product who do not need the state-of-the-art technology available in the Western World.

4.35 The following products of BEL are currently being exported to South East Asia and SAARC Countries.

Malaysia	—	Vacuum Interrupter Tubes
Singapore, Hong Kong	—	Electronic Components
Indonesia	—	Spare parts for Radar
		Ground-to-Air Radio
Sri Lanka	—	Night Vision Goggles

4.36 There is no specific collaboration with any foreign country. However, exports are effected based on the normal purchase contracts. In some of the cases supplies are made against Government of India Line of Credit.

4.37 When asked to state the steps taken by BEL to produce state-of-the-art technology to compete with world technology, the Ministry in its post briefing replies stated that :—

(a) Strengthening of in-house R&D

(b) Technology Planning group for emerging technologies

(c) R&D tie up with DRDO Labs for technology

(d) Tie up with foreign partners for identified technologies

(e) Investment in key technologies

4.38 In their written replies the Ministry informed the Committee about the initiatives taken by them for enhancing export as under:

A. The various initiatives taken by the Ministry for enhancing exports are:

(a) Under the chairmanship of JS(SY), a committee was formed to expedite clearance of export proposals submitted by BEL e.g. Sudan, Indonesia, Sri Lanka and Russia.

(b) JS(X) has recommended the visit of Malaysian Army Chief to BEL.

(c) Defence Offset Facilitation Agency (DOFA) to facilitate and monitor offset implementation is created.

(d) Offsets have been made mandatory for Defence contracts worth more than Rs 300 crores.

(e) BEL has been participating in international exhibitions to promote its products for exports. Some of the recent exhibitions in the last 3 years:

April 2003	Latin America Defence 2003, Brazil
September 2004	Africa Aerospace & Defence 2004, South Africa
May 2005	IMDEX (International Maritime Defence Exhibition & Conference), Singapore
September 2006	Africa Aerospace & Defence 2006, South Africa

4.39 During the study visit of the Committee to BEL, Bangalore, when asked about the comments of the BEL on Global Positioning System(GPS) for civil applications and the advertisement and Marketing of the products, the BEL stated :—

> "BEL is also exploring the usage of available expertise for satellite based navigation applications in view of the programme GAGAN of ISRO and Airport Authority of India."

Appointment of agents for export

4.40 When asked whether BEL appointed agents for export and paid commission to them and the number of cases in which the commissions have been paid and under what guidelines, the Ministry in its written replies stated :—

> "BEL has not appointed any agents in India for export of its products. BEL has not paid any agency commission to any companies in India for export of its products.
>
> BEL is appointing representatives in selected foreign countries for export of its products. These representatives provide support to BEL for various activities like business development, details of market leads, liaising with the perspective customer, following up for payments, after sales support etc.
>
> The terms & conditions on which BEL appoints representatives abroad are given below. These form part of the contract between BEL and the representatives appointed.

Obligations of the agent

1. THE AGENT shall canvass for the sale of PRODUCTS in the TERRITORY and direct all orders received from the customers to THE PRINCIPAL. In respect of other countries excluding countries where THE PRINCIPAL have already entered into Agency Agreement, THE AGENT shall canvass for the sale of PRODUCTS with prior consent of THE PRINCIPAL.
2. THE AGENT shall periodically keep THE PRINCIPAL informed of the activities of competitors of THE PRINCIPAL in the TERRITORY.
3. THE AGENT shall not represent any other Firm/Company/ Institute for sale of goods similar to the PRODUCTS either directly or indirectly.

4. THE AGENT shall not sell the PRODUCTS to customers other than those within the TERRITORY, except with the prior consent of the PRINCIPAL.
5. THE AGENT shall advise PRINCIPAL with a written sales forecast for at least twelve subsequent months.
6. THE AGENT shall arrange for all Bid Bonds and Performance Bonds whenever the tenders are submitted by THE AGENT. In all other cases, PRINCIPAL will arrange for such Bonds upon advice by the AGENT.
7. THE AGENT shall coordinate the repatriation of all moneys due to THE PRINCIPAL by arranging Letter of Credit in favour of the PRINCIPAL as per the contract terms and also render such assistance as may be required in cases where the customer places order on THE AGENT.
8. THE AGENT shall be responsible for assisting the Customer/THE PRINCIPAL depending on specific project requirements for customs and port clearance, local transportation, labour contracts, clearance and payment of bills and resolution of disputes, intimation of adverse/ positive feedbacks in time with respect to problems in supplies etc.
9. THE AGENT shall carry on such advertising and sales promotion campaign as deemed necessary in consultation with THE PRINCIPAL to maximize sale of the PRODUCTS in the TERRITORY, on terms to be mutually agree upon in writing.
10. THE AGENT shall interact with the customer and liaise with THE PRINCIPAL for any major problems within the warranty period or after sales service. Minor problems of PRODUCTS within warranty period will be looked after by THE AGENT's personnel. All local costs and expenses for such after sales service shall be met by THE PRINCIPAL at actuals. Subject to the prior approval of THE PRINCIPAL.
11. THE AGENT will liaise with the customer and inform THE PRINCIPAL of any problems regarding license or authority required to operate on specific frequency etc by the customer.

Obligations of the Principal

1. THE PRINCIPAL shall supply the PRODUCTS to the customers against orders received through THE AGENT and accepted by THE PRINCIPAL.

2. THE PRINCIPAL shall not be responsible for obtaining any licenses or other permissions for holding and operating the PRODUCTS in specific frequencies etc., by the customer shall take sufficient care to comply with any statutory requirements that may be applicable or imposed by the Government/Regulatory Authorities for such PRODUCTS.

Compensation

1. For all orders on the PRODUCTS materialized through the efforts of THE AGENT, the compensation payable to the AGENT shall be mutually agreed on case-to-case basis, subject to a maximum of 10%* on FOB value of the PRODUCTS supplies to the TERRITORY which will be payable on full realization of sale proceeds, except as provided under clause 3.2 and 3.4 below.
2. For Turnkey Projects, in case of orders received through the efforts of the AGENT, the compensation payable to the AGENT to be mutually agreed upon on a case-to-case basis, subject to a maximum of 10%* on FOB value of supplies for the project in the TERRITORY which will be payable on full realization of sale proceeds.
3. In case of orders received for supplies outside the TERRITORY through the efforts of THE AGENT as confirmed by the PRINCIPAL, the Compensation payable to THE AGENT shall be mutually agreed on a case-to-case basis provided THE AGENT has taken the prior consent of THE PRINCIPAL before such supply.
4. For supplies covered under Indian (Government-of-India or EXIM Bank) Line-of-Credit, the payment of Compensation will be governed by the terms of the Credit, if any, pertaining to Agency Compensation.
5. Both parties to this Agreement acknowledge that to obtain some orders it may be necessary to reduce the selling price and under such conditions Compensation payable may be reduced by mutual agreement.
6. All Compensations that may accrue to THE AGENT shall be remitted by THE PRINCIPAL subject to deductions of taxes as per Indian Tax Laws as applicable for THE AGENTS abroad. Unless otherwise agreed, the Compensations shall

*The percentage compensation varies depending on country, volume of business, nature of contract etc.

be paid to THE AGENT in the same currency as that in which THE PRINCIPAL received payments.

7. It is understood that the normal day-to-day operating expenses like Telex, Fax, ISD Calls and local expenses etc., will be borne by THE AGENT.

8. Compensation will become due to THE AGENT on receipt by THE PRINCIPAL of payments directly from customers and will be paid by THE PRINCIPAL within 30 days of full realization of sale proceeds.

9. The details in respect of exports with regard to appointment of various representatives and commissions paid are given at Enclosure."

Sl.No.	Country	Name of the representative	Type of agreement	Date of appointment	Business generated		Product	Commission paid (if any)
					Value	Year		
1	2	3	4	5	6	7	8	9
1.	Algeria	Hampton Capital Corporation	Non-exclusive	1st Aug. 2000				-
2.	Bangladesh	(a) Star Trading Corporation	Non-exclusive	21st Jan. 2002				-
3.	Botswana	Kudu Communication	Non-exclusive (Pty) Ltd.	5th Dec. 2004				-
4.	Brazil	Tannay Holding Inc.	Non-exclusive	12th No. 2003				-
5.	Egypt	Britlodge Holding	Non-exclusive	4th Jun. 2004			-	
6.	Ghana	Nodeco Industrial (GH) Ltd	Non-exclusive	5th Nov. 2002	US $91,200	2001-02 to 2003-04	Spares of RAX and Solar Pelican Signal	US$ 4,740
7.	Malaysia	Giditek Deterprise	Non-exclusive	12th Jun. 2006				-
8.	Mayanmar	Tractorsworld	Letter of Authorisation	21st Jul. 2005				-
9.	Nepal	(a) Arniko International Pvt. Ltd.	Non-exclusive	19th May 1999	US$ 1,474,000	1999-00 to 2003-04	Spares of RAX, TDMA-PMP, V-SAT System, TV Uplink	US$21,250

1	2	3	4	5	6	7	8	9
		(b) International Business Link	Eexclusive	5th Nov 2004	US$ 572,722	2004-05	Night Vision Goggles and HHTI	US$ 17,200
10.	Sri Lanka	(a) Excel Communication Systems (P)	Non-exclusive	20th Aug 2003	US$ 48,000	2004-05	Night Vision Goggles	US$2,400
		(b) Swedish Trading Co. Ltd.	Non-exclusive	16th July 2004		-		
11.	Sudan	Al Mawafi Company Ltd.	Non-exclusive	25th Oct 2004			-	
12.	South Africa	Al. Elwazani Mktg Pvt. Ltd.	Letter of Authorisation	31st Mar 2004				-
13.	Saudi Arabia	Wacker International Est	Letter of Authorisation	27th June 2005				-
14.	Sultanate of Oman	Khimji Ramdas	Non-exclusive	30th Mar 2004				-
15.	Suriname	Elto NV	Non-exclusive	4th Aug 2004	US $ 2,710,000	2004-05 to 2006-07	Solar Traffic Signaling System and HF Radios	-
16.	Syria	Adko Engineering & Gontracting	Letter of Authorisation	26th May 2004				-
17.	Thailand	Milliard International Co. Ltd	Non-exclusive	14th June 2005				-
18.	Turkey	Detronik TIC Ltd	Non-exclusive	19th Oct 2004				-
19.	Zimbabwe	Pentrad Investment Ltd.	Letter of Authorisation	10th Feb 2005				-
20.	Uganda	Rank Consultant Pvt. Ltd.	Letter of Authorisation	17th Jan 2006				-
21.	Yemen	Al-gawf Trading & Services Ltd.	Letter of Authorisation	28th June 2005				-
22.	Cango DRC	White Gem Pvt. Ltd.	Letter of Authorisation	30th April 2006				-
23.	Israel	Y. Sandak Holdings Ltd.	Letter of Authorisation	16th Mar 2006				-

(vii) Competitiveness

4.41 When asked about steps being taken to modernize BEL to bring it to World Standard Company, the Ministry in their written replies stated :—

"BEL is continuously modernizing facilities in order to bring it to world standards. In this direction, the company has taken various modernization activities of its Units. Some of the modernization activities carried out by BEL are:

(i) Modernisation of Fabrication and Assembly Work Areas.

(ii) Creating Mass Manufacturing Facilities

(iii) Implementation of SAP across all Units/Offices

(iv) Addition of new facilities for Inspection & Testing

(v) Creation of modular offices

(vi) PC to all engineers

(vii) Establishing Intranet in all Units

(viii) Training of employees & executives in identified areas like Phased Array Radars, Frequency Hopping, Encryption, Networking, Electronic Warfare, Six Sigma, Team Building etc.

As BEL is involved in the manufacture of sophisticated electronic equipments wherein the technologies of not only the products, but also the processes change continuously. Specific groups in all the Units continuously scan the technology changes that are taking place and identify new machines in the world market for acquisition. This enables company to maintain the set up at par with international standards. Further, whenever a new product is introduced based on in-house/indigenous design or collaboration, new manufacturing line/plant & equipment are acquired based on the new product needs. To meet the stringent requirement of new technology, BEL has adopted various Quality Initiatives like Six Sigma Methodology as a process for achieving break-through solutions, has set up Quality Improvement Teams in different work areas, benchmarking of processes and self-certification of some of its products. The company has been strategically adopting this philosophy for introducing modern facilities and updating the technology status in all its Manufacturing Units, like setting up of Advance Manufacturing Facilities, CNC Facilities and Test Facilities."

(Recommendation No. 5)

Diversification

4.42 The Committee observe that in the last fifty years BEL is doing good turnover and developing new products and technology. The Committee note that in its endeavour, BEL always gives priority to Defence Sector and on an average, more than 80 per cent of its turnover is from the Defence Services. Turnover of BEL from the production for the civilian market is 15 to 20 per cent. More than 13 per cent of business comes from PSUs, like MTNL, VSNL, Airport Authority etc. and less than 2-3 per cent turnover is from the other civilian market. In this connection, the Committee desire that the Ministry should give a re-look for more diversification and explore new civil markets. The Committee wish to emphasise that BEL should explore the civil market and see what are the areas where it can help the Ministries of Shippings, Railways and other private homes/ organizations in the field of communications to check, drug trafficking and ensure effective safety and security of passengers and goods.

The Committee wants that BEL must emphasise upon more diversification and thereby earning more profits from the civil market and can fund its R&D programmes.

The Committee further desire that for effective and efficient business management BEL should have two separate divisions of its business, one devoted completely for commercialising the civil market and the other solely meant for Defence purpose.

(Recommendation No. 6)

Infrastructure and their upgradation

4.43 The Committee note that BEL has been pro-actively modernizing and upgrading its infrastructure as per modernization and diversification of the projects. Some of the new infrastructure are in the process of establishment in various units of BEL. The facilities so created will help in improving the process of manufacture and in turn improve the efficiency of manufacturing and productivity. This will also add versatility in units to handle different kinds of related jobs. Therefore, the Committee recommend that the Ministry should expedite the establishment of new infrastructure to ensure the above improvements. The Committee further note that there is a stiff competition in supplying electronic Defence equipment to the developed countries and they are concentrating on South-East Asia, SAARC countries and African Continent where state-of-the-art

technologies are not required. Therefore, the Committee desire that keeping in view the rapid obsolescence of electronic equipment and need for producing state-of-the-art technologies and more diversification both in Defence and civilian market BEL must strive to continuously and vigorously upgrade and modernise its infrastructure so as to meet the ever-changing and increasing requirements of the civil, Defence Markets and enhance export potential.

(Recommendation No. 7)

Capacity utilization & order book position

4.44 The Committee note that Bharat Electronics Limited (BEL) has 9 manufacturing units spread over different parts of the country. The Committee further note that in spite of the diversification, adjustment and shifting of loads from one unit to the other, some of the manufacturing units at Bangalore, Ghaziabad, Machilipatnam, Panchkula and Kotdwara units are not fully loaded where 30-40 per cent capacity is lying idle for want of orders of vital Defence equipment viz. MK II, Upgraded Flycatcher Radar, Battle Field Surveillance Radar (Short Range), Intelligent Message Terminal (IMT), BSS (Sanjay), Night Vision Devices etc.

The Committee are distressed to note that order book position of BEL is a matter of serious concern as the order book is not proportionately increasing in comparison to the yearly dispatches. For the year 2006-07, the dispatch plan is Rs. 4200 crore and order book as on 1st April 2006 is Rs. 6633 crore, out of which executable order is only Rs. 3541 crores. With these, there is a gap of about Rs. 700 crores between the available executable orders and the dispatch targets. Some of the units of BEL are not fully loaded and they are yet to get additional orders. The Committee are further pained to note that the amount of orders received from the Ministry of Defence has been drastically reduced from Rs. 4548 crore in the year 2002-03 to Rs. 834 crore upto 1st October 2006. The Committee feel that this drastic reduction is a very serious matter. This indicate lack of faith of the Armed Forces on the products produced by BEL. Therefore, the Committee strongly feel that the Ministry of Defence should examine this matter carefully and find out the equipment for which the units of BEL are lacking orders from the Armed Forces and whether the same equipment is being procured from other sources. Therefore, the Committee desire that there is an urgent need to give a serious look to this matter and produce high-end technologies by intensifying R&D as per the present day's requirements to face the

ever changing security challenges. In this way BEL will attract more customers and the Government will minimize foreign dependence for procuring Defence equipment and promote indigenization. This in turn will also improve the capacity utilization of all the units.

(Recommendation No. 8)

Delivery schedule

4.45 Pertaining to the delivery schedule of the various projects under BEL, the Committee observe that in case of 20 equipment, the delay is less than six months. The period varies from one to six months. In case of 15 equipments, the delay is more than six months. The period of delays varies from 7 to 25 months. The major reasons for delay are sourcing problems, concurrent engineering, design related issues obsolescence, delay related to trials and evaluation.

In view of the above problems, the Committee desire that the Ministry of Defence and BEL should give a serious thought and take corrective measures to minimize delays in completion and supply of vital equipment and they must adhere to the prescribed time schedule to avoid time and cost over run and deliver the same to the Armed Forces and other customers at the earliest. Because for getting the best value for the scarce resources being used for the nobel job the Ministry should ensure to minimize delay. The Committee also desire that the Ministry must strictly deal with the recovery of payments by BEL.

(Recommendation No. 9)

Need for expanding export market

4.46 The Committee are distressed to note that the export value of BEL's different products is very low and inconsistence. Further, BEL has admitted their incompetence to export their products to advanced countries. The export market is limited to South-East Asia, SAARC countries and African Continent where state-of-the-art technologies are not required. This indicate that BEL has to walk a mile ahead in producing high-end technologies in order to compete with the defence industries of other countries. The Committee further observe that there is no specific collaboration with any foreign country. Exports are effected based on the normal purchase contracts and in some of the cases, supplies are made against Government of India Line of Credit. Further, there is stiff competition in the world defence market. Therefore, the Committee strongly recommend that BEL must take concerted efforts to keep abreast with the emerging

security scenario and rapid technological changes around the world and intensify its R&D by strengthening the in-house R&D and tie up with DRDO and leading foreign partners and putting sufficient investment in key technologies to produce high-end products to attract foreign countries apart from South-East Asia, SAARC Countries and African Continent and earn foreign exchange for India. The Committee further recommend that the Government should consider evolving suitable arrangements in Indian Embassies abroad through which a common outlet for sale of all the products of our Defence PSUs can be found in order to maximize our export earnings and also put to optimum use available surplus production capacities. Besides the Defence attaches and other Officers posted in Indian Embassies abroad must take concerted efforts to study the requirements of that particular country and supply the inputs/ feedbacks to BEL through the Ministry of Defence in order to intensify their R&D efforts and produce the products in order to attract the foreign countries and expand its export market. The Committee also wish to stress that BEL must explore the usages of available expertise for satellite based navigation applications in view of the programme GAGAN of ISRO and Airport Authority of India for advertisement and marketing of the products.

(Recommendation No. 10)

Need to ensure competitiveness

4.47 The Committee observe that the objectives of BEL is to attain technological leadership in defence electronics to constantly bench mark company's performance with best in class internationally and to raise marketing availabilities to global standards. However, the Committee are distressed to note that the same has not been reflected in the export potential of BEL to different countries. BEL is finding difficulties in exporting their products to the developed countries and is only exporting to countries like South East Asian Countries, SAARC Countries and African Continent where state-of-the-art technologies are not required. The Committee do not agree with this approach of BEL. Therefore, the Committee strongly desire that to compete with international market which is full of challenges, the BEL must make concerted efforts to update the technologies, which have very high rate of obsolescence, and produce high-end technologies to meet the changing requirements of the countries. The Committee also desire that to ensure quality, BEL must adopt the process of self-certification for all its products.

(Recommendation No. 11)

Appointment of Agents for export

4.48 The Committee note that BEL has appointed representatives in selected foreign countries for export of its products. These representatives provide support to BEL for various activities. The compensation payable to the agent is mutually agreed upon case-to-case basis, subject to a maximum of ten per cent on FOB value of the products supplied to the territory and is usually payable on full realization of sale proceeds. The percentage compensation varies depending on country, volume of business, nature of contract etc. The Committee desire that for maintaining transparency and to ensure accountability of the representatives, the Ministry should undertake a thorough exercise and brought out a detailed guidelines regarding the terms and conditions for appointing the agents, functions and procedure for payment of compensation etc. The Committee may be apprised about the progress made by the Ministry in this regard.

ANNEXURE I

PRODUCTS OF ARMY

Radars	Communication	Tank Electronics & Opto Electroncis	Electronic Warfare Systems
Fire Control	Manpack/Mobile	Night Vision Devices (Goggles/Binoculars)	Surveillance Monitoring
Surveillance/ Tracking	Truck/Ground	Laser Range Finders	Direction Finding
Secondary	Static/Mobile Digital Troposctter	Tank Fire Control Systems	Active Jamming
Surveillance (IFFs)	Satcom	Stabilizers for Tank	
	Switching	Thermal Images	
	GPS Systems	IOEs	
	Encryption/Applique Units		

PRODUCTS TO NAVY

Radars & Sonars	Communication	Control Systems	Electronic Warfare Systems	Others
1	2	3	4	5
Navigational	Shipborne Communication Eqpt	Modular Eqpt. for Command & Control Appln. (EMCCA)	Surveillane Monitoring	Simulators
Surveillance/ Tracking Radars	Transreceivers	EOFCS	Direction Finding	Antena
Fire Control Radars	Transmitters		Active Jamming	
Secondary Surveillance Radars (IFFs)	Composite			

1	2	3	4	5
Fixed/Variable Depth Sonars	Communication System			
Towed Torpedo Decoys				
Data Handling & Display Systems				
Sonobuoys				

PRODUCTS TO AIR FORCE

Radars	Communication	Electronic Warfare Systems	Others
Static/Mobile	Transmitters	Surveillance Monitoring	Antenna
Surveillance/ Low level Tracking	Ground to Air Communication	Direction Finding	
Secondary Surveillance (IFFs)	Static/Mobile Digital	Active Jamming	
	Troposcatter		
	SATCOM		

ANNEXURE II

PRODUCTS TO CIVIL

Radars	Communication	Sound & Vision Broadcasting	OPTO Electronics	Components	Others
Airport Surveillance	Transreceivers	Equipment to AIR/DD MW/SWFM Broadcast TX	Night Vision Devices	ICs	Solar Photo Voltaic Systems
Satellite Vehicle Tracking	Transmitters	Studio Eqpt for Air	Ophthalmic Laser	HHMCs	Simputers
	Exchanges for DOT	TV-Low/High Power Transmitters		Silicon Small Signal/Power Devices	Set Top Box
	Satcom Stations (APNET, POLNET)	TVRO-TV-Receive ONLY Terminal		Crystals & TCXOs	Electronic Voting Machine
	Communication System for Railways	Satellite Uplinks		Microwave Tupbes	Surgical Microscope
		TV Studio Eqpt		Passive Vacuum	LCD Displays for Airports
		Outside Broadcast Vans		Devices	Vehicle Tracking Systems

CHAPTER V

INDIGENIZATION

5.1 The Committee are informed that as part of its phased indigenisation programme, BEL is progressively increasing indigenisation of projects where TOT has been obtained, in order to achieve self-reliance, increase work content, enhance value addition and have better control of parts indigenised. The indigenisation activity is an ongoing process in all Units of BEL to conserve Foreign Exchange. Raw Materials, Components and Subassemblies are covered under this activity.

5.2 Pertaining to the efforts being made by the Ministry for Indigenisation of products the Ministry stated:

> "Indigenisation is a continuous process and the Ministry was initially directly involved in this through Technical committees functioning under the DGQA. In Feb. 2002, the Ministry transferred the responsibility of indigenization of material required for production by DPSUs and Ordnance Factories to them. Further, for spare part items, the service Headquarters have also assumed responsibility for indigenization. Recently, in pursuance of the recommendations of the Kelkar Committee, the Ministry has notified the procedure for acquisition of items identified for development and production in the country, *i.e.* the procedure for "make" products. As far as the efforts made by DRDO are concerned this is a continuous process, where products designed and developed by DRDO labs in consultation with Armed Forces are productionized through either DPSUs/OFs or Private industry."

5.3 The success ratio in achieving indigenisation of products are as under:

> "The indigenisation effort in the company has been quite successful and BEL could achieve substantial amount of cost reduction through indigenisation. In some of the major projects, the current level of indigenisation against start of the production is indicated below:—

Equipment	Indigenous Content	
	At the start of Production	Current Level
1	2	3
USFM Radar	28%	70%
Flycatcher Radar	15%	60%

1	2	3
Reporter Radar	5%	75%
UHF Radio Relay RL 432	5%	56%
Laser Range Finder LH-30	20%	70%
HHTI	5%	35%
PRC 6020	8%	66%

5.4 Regarding future strategy for indigenisation the Ministry in a written note submitted as under:

"As far as the Ministry is concerned, the selection of "Raksha Udyog Ratnas" and processing of "Make" category of cases using the procedure promulgated recently is expected to give a fillip to Indian Industry to take up indigenous production of sophisticated Defence Equipment. As far as BEL is concerned, the future strategy of the company with regard to indigenisation is to find out alternatives for various imported sources in order to cut down cost, sourcing of indigenous subassemblies and in the newer projects also, introduce at design phase itself items like Microwave Assemblies, Power Supply Units, Antenna, Electromechanical components, Accessories etc. Some of the indigenisation efforts are given below:

(a) Sourcing of indigenous sub-assemblies for Reporter Radar

(b) Sourcing of indigenous Tx Beamformer and Arrays for CAR Radar

(c) Sourcing of RFUs from M/s Astra, Hyderabad

(d) Sourcing of indigenous accessories for PRC 6020"

5.5 Regarding the percentage of indigenous components in all the equipment produced by the BEL since last five years are as under:

Year	Total Material (Rs. Crores)	Indigenous Material (Rs. Crores)	% of Indigenous Content to Total Material
2005-06	1850.63	836.78	45.22
2004-05	1758.23	616.36	35.06
2003-04	1479.77	362.02	24.46
2002-03	1479.07	339.56	22.96
2001-02	1086.63	350.44	32.25

5.6 When asked whether BEL has any collaboration with any Indian or Foreign Company to produce indigenous semiconductors to meet our requirement, the Ministry in their written replies stated:

"BEL had the following major collaborations in the area of Semiconductor manufacture:

1. 1963: Collaboration with Philips, Holland for manufacture of Germanium Semiconductor devices.
2. 1967: Collaboration with Philips, Holland for manufacture of Silicon Small Signal Devices.
3. 1971: Collaboration with RCA, USA for manufacture of Silicon Power Transistors & Integrated Circuits.
4. 1983: Collaboration with ACRIAN, USA for manufacture of RF power transistors.
5. 1987: Collaboration with Ericsson, Sweden for manufacture of Telecom ICs.

At present, BEL does not have any collaboration with any company for semiconductors.

During mid 80's and 90's, BEL had made a proposal to upgrade the semiconductor manufacturing facilities to meet partly the country's requirement. The chip manufacturing facilities are highly capital intensive and BEL, on its own, was not in a position to invest because the project was economically unviable. However, BEL tried to get funding from the Government but it did not materialise. Today, in view of liberalization and availability of components with totally changed duty structure, BEL does not find this investments in chip fabrication facilities, an economically viable project.

BEL is making incremental investment to keep the existing facility going and make best use of it. BEL is using facilities already established to design and manufacture Semiconductor Devices *viz*., Small Signal Devices, Power Devices, Hybrid Microcircuits and Integrated Circuits for use by Indian industry."

5.7 When asked to state where India stands in terms of having state-of-the-art-technology and Night Fighting Equipment, Tanks and Aircraft which are being produced by BEL and upto what extent country is dependent in these areas on foreign suppliers:

"BEL started the manufacturing of Night Vision Devices (NVDs) in late 80's in view of strategic importance of this technology in

modern warfare. Instrument Research and Development Establishment (RDE), a DRDO laboratory was the technology partner for BEL. The NVDs manufactured by BEL are based on two types of technologies *viz*., Image Intensifier Tube based NVDs and Thermal Imager based NVDs**.**

BEL has developed different versions of NVDs including Weapon Sights based on image Intensifier Tubes. BEL also acquired the technology to manufacture Image Intensifier tubes in 1990 by setting up a Joint Venture with M/s Delft. The venture, which later became a subsidiary of BEL, has been upgrading the performance of these tubes.

The technology for II Gen I.I. Tubes was provided by JV partner, M/s DELFT and this has helped BELP to meet the country's strategic requirement. Based on these tubes various types of NVDs were manufactured and supplied to Armed Forces. BEL attained self sufficiency for II Gen I.I. Tube based devices. The customers are now asking NAVDs based on Super Gen / III Gen I.I. Tubes with increased performance, light weight and compact devices. MoD has given task for acquiring the technology for these NVDs and associated I.I. Tubes to BEL.

For NVDs based on Thermal Imagers, BEL started manufacture of Hand Held Thermal Imagers based on Cooled Thermal Imager Technology obtained from M/s Elop as it was not indigenously available. With this, BEL has developed expertise in 8 – 12 microns T.I. technology and developed various variants of these NVDs. BEL has now acquired Optical and Image Processing Technology except for Thermal Detector component, which is being outsourced from the vendors. BEL has established stat-of-the-art facilities for the development, manufacture and testing of these NVDs. BEL is also making efforts to acquire the technology for Thermal Detectors from the reputed foreign vendors. BEL has also initiated development work in 3-5 micron and uncooled T.I. technology."

5.8 During oral evidence, the CMD of BEL stated :—

"We are doing R&D projects either ourselves or along with DRDO. If they are meeting the customer's requirements, then we are getting a preference. Otherwise, for all orders, we are competing with international manufacturers and private vendors. I would like to submit to the hon. Members that out of our total revenue, 70 to 75 per cent revenue is coming from products manufactured based on indigenous design and development.

Nearly, 75 per cent of the revenue is coming from the products manufactured based on indigenous design and development, and only about 30 per cent of the revenue is coming from products manufactured based on technology transfer."

(Recommendation No. 12)

Indigenization

5.9 The Committee observe that as part of indigenization effort, BEL has got some success in achieving indigenization level in equipments like USFM Radar, Flycatcher Radar, Reporter Radar, UHF Radio Relay RL 432, Laser Range Finder LH-30, HHTI and PRC 6020. The Committee also note that there has been consistent improvement of the percentage of indigenous content to the total material of the equipment produced by BEL since 2001-02. However, the overall indigenization level is not very satisfactory. The percentage of indigenous content to the total material during 2005-06 is only 45.22% is very dismal. The Committee are informed that out of the total revenue earned by BEL, 70-75 per cent of revenue is coming from products, manufactured based on indigenous design and development and only about 30 per cent of the revenue is coming from products, manufactured based on technology transfer and BEL is getting a preference if they are meeting the customers' requirement. Keeping in view the above facts, the Committee strongly feel that BEL has to go a long way in achieving sufficient indigenization level. Therefore, the Committee recommend that BEL must intensify its in-house R&D and concerted efforts may be made to meet the customers requirements and earn more revenue thereon. In case of transfer of technology BEL must go beyond the position of system integration after importing the parts. The Committee desire that BEL must produce the systems/sub-system based on the technical know how it has received from the foreign countries on the transfer of technology agreement.

CHAPTER VI

MODERNISATION/UPGRADATION

(i) Perspective Plan of BEL

6.1 The various steps that are being followed in the company towards formulating long-term business plans can be broadly classified as follows:

(i) Study of the known Perspective Plan of the customers.

(ii) Technological assessment to identify sources of technology like in-house R&D, R&D Institutions & DRDO, licensed arrangement with foreign collaborators to meet the future requirements of customers.

(iii) Identifying the gaps between our own intended growth plans and what is achievable through (ii) above.

(iv) Identification of related diversification segments to fill up the above identified gap (iii)

(v) Various actions required in advance to meet the above strategic plan including R&D plans, diversification plans, establishment of Joint Ventures etc.

6.2 The company has adopted a process of preparing a Roll-on-Plan for a five-year duration. Every year, in the month of April, the plans are presented by the Unit Heads/SBU Heads taking into account orders on hand, products under development, business areas identified for diversification, likely receipt of orders based on customer indication and Unit/SBU growth.

6.3 The Roll-on-Plans are reviewed and updated annually taking into account the changes in the requirements and needs of the customers.

6.4 Targets fixed and achievements made during 10th Plan period are given below:

(Rs. in Crores)

Year	Sales Target	Achievement	% Achievement
2002-03	2050	2508	122
2003-04	2500	2500	112
2004-05	3050	3212	105
2005-06	3600	3536	98
2006-07	4000		

6.5 As can be seen, the company is able to meet its targets and has always been exceeding the target except during 2005-06 the company could reach around 98% of the set target.

6.6 The Ministry in their written note informed the Committee that:—

"For the 11th Plan period, BEL has worked out a business plan, which is based on customers' projected requirements and market inputs. Even though BEL does not have access to the long-term perspective plan of the 'Armed Forces, the inputs regarding customer need are collected during interactions in institutional meetings, progress reviews with customers, interactions with DRDO, business partners, interactions for proactively developed products with customers etc. the business plan for the 11th Plan period being pursued by the company is given below:

Year	Turnover (Rs. in crore)
2007-08	5000
2008-09	5750
2009-10	6900
2010-11	8300
2011-12	10000

Every year, the business plan is fine tuned based on the marketing inputs and turnover targets covering a period of three years are worked out and put up to BEL Board for approval."

6.7 During the study visit of the Committee to BEL, Bangalore, when asked how the users are involved in the MoU target fixing the Ministry in their written replies stated:

"MoU of the company is formulated every year based on the guidelines issued by Department of Public Enterprises (DPE). The guideline stipulates that the target fixed for the year should be such that it is realistic and growth oriented. The targets are required to be higher compared to the targets and achievements for the previous year. The Budget Estimates approved by the Board, forms the basic targets in respect of various MoU parameters and are put in the 'Very Good' target column. The 'Excellent' targets are normally 5% higher than the 'Very Good' target.

There is no direct user involvement in MoU target fixing. There is however indirect involvement. Some of the important parameters that constitute the MoU are gross margin, value of sales and customer satisfaction. In drawing up targets for the financial year, the current order book position, the feedback from the customer as well as the projections of user requirements for the ensuing financial year etc. are taken into account. Hence the MoU targets relating to Defence orders are negotiated on the basis of projections of the customer as well as ability of the company to executive the orders. As far as civil customers are concerned, there is no mechanism for user interaction in MoU fixing. However, wherever, the customer is the State/Central Govt. the requirements are either known or are discussed with the users and finalised at the appropriate level."

(ii) Measures for Modernisation/Upgradation

6.8 BEL has been continuously modernizing its infrastructure to be in tune with the changing needs of the technology/products. On an average the company has been spending more than Rs 100 Crs. on capital investment in creation of modern facilities in all its Units. The expenditure on infrastructure is met wholly through the internal accruals of the company and in the coming years the expenditure on modernization of infrastructure is expected to double.

6.9 Some of the new infrastructure established or in the process of establishment in various Units are given below :

* Setting up of Near field test facility – To develop and manufacture state-of-the-art phased array antennae at an estimated cost of Rs 9 Crs.
* Setting up of manufacturing test facility for SRE – at an estimated cost of Rs 20.21 Crs.
* Augmentation of facility for manufacture of space grade receivers – For communication satellites launched by ISRO at an estimated cost of Rs 5.2 Crs.
* Mass manufacturing facility – For assembly of electric circuit boards using surface mount devices at an estimated cost of Rs 10.9 Crs.
* Setting up of test facility, Turret Stand for manufacture of Stabilizer and Automatic loading Gear for T90-S Tanks – This will help in the indigenous manufacture of 1000 Nos. of T90-S tanks for which BEL has to supply stabilizers and auto loading gear.

* Augmentation of IT infrastructure – For implementation of comprehensive ERP solution across all the Units/Offices at an estimated cost of Rs 37.51 Crs.
* Manufacturing facility for co-production of Micro Wave Assembly for TARANG Mk IB – For producing super components for use in Electronic Warfare Equipment at an estimated cost of Rs 8.85 Crs.
* Upgradation of shelter manufacturing facility – To produce state-of-the-art shelters required for Defence Forces at a cost of Rs 6.6 Crs.
* Expansion of Capacity for Vacuum Interrupters – From 25000 to 50000 at an estimated capital investment of Rs 16 Crs.

6.10 The facilities so created will help in improving the process of manufacture and which in turn improve the efficiency of manufacture and productivity. This also adds versatility in Units to handle different kinds of related jobs.

6.11 About the upgradation the CMD, BEL during oral evidence stated:—

> "Some of our systems like L-70 guns and Zu-23 and Shilka are all upgrade programmes. We are working on some of them on our own. For instance, on L-70 we are working with Ordnance Factories. On Zu-23 we are working with an Israeli company because we do not have all the expertise to develop these upgrade programmes."

6.12 Pertaining to various international tie-ups with the BEL the representatives of the Ministry of Defence during oral evidence stated:—

> "The Company has been exploring tie-ups for futuristic products in the defence market. The company has developed several products and upgraded versions of fire control radars for the Army-Air Defence System. It has developed frequency hopping radios, airport surveillance radars between ground to air and battlefield surveillance radars. The company is in active discussion with foreign companies for technology transfer. BEL is working on nano technology and solar cells is another growth area for the company. They are also looking for technology for some advanced products form international companies because they do not have indigenous answer for this."

(iii) Status of major projects on hand

Sonars

6.13 The status report in respect of technology for sonars and radars and efforts made by BEL to attain self-reliance as furnished by the Ministry in their written replies are as under :—

Surface Ship Sonars

6.14 "The indigenous development programme started in 1974 and up to now, 25 systems have been commissioned in Naval Ships. The sonar system is manufactured completely in India and only components are sourced form abroad. All sonars use transducers, which are also manufactured in India. Sonars under this category are of NPOL design. BEL has taken up the upgrade and reconfiguration of the original systems. Some of the sonars developed and supplied under this category are :

- Advanced Panoramic Sonar Hull Mounted 9APSOH)
- Hull Mounted and Variable Depth Sonar (HUMVAD)
- Hull Mounted Sonar Advance (HUMSA)
- NAGAN
- Towed Torpedo Decoy (TOTED)

With the experience of manufacturing these Sonars, BEL has developed expertise for high frequency, hull mounted, single array, dual array sonars. The special digital processing techniques for getting better range and bearing accuracy have also been acquired. Also, the digital beam forming technology has been deployed in these sonars."

Submarine Sonars

6.15 "The indigenous development programme started in 1990s and up to now 5 systems have been manufactured and two are under evaluation in Indian submarines. The sonar systems is manufactured by BEL with designs from NPOL."

Airborne Sonars

6.16 "BEL has been working in this range of sonars with designs from NPOL since 1990. The sonars under this category are :—

- MIHIR – Light Weight Helicopter borne dipping sonars.
- SONOBUOYS – Air dropped passive non-directional radio sonobuoy

Over the years, BEL has assimilated various technologies for different types of sonars and also established in-house facilities for testing and manufacture of these sonars. NPOL, Cochin is a technology partner for BEL for meeting most of the requirements of Navy. However, in certain emergent cases, with new technologies, foreign collaboration is also resorted. BEL is trying to tie up with foreign collaborator for Towed Array Sonars for Submarines, Airborne sonars (LF version) and Mine hunting sonars."

Radar

6.17 "BEL started Radar manufacturing way back in 1964 and since then, a large number of Radars have been supplied both for Military and Civilian Customers. The Radars manufactured at BEL include a wide variety of Radars for Land based and Ship borne applications. These Radars have been manufactured through joint development/ collaboration with DRDO Labs or technology obtained from foreign vendors.

BEL's R&D strengths are aimed towards absorption of technology and development of products, subsystems and systems. As a result, BEL has been able to upgrade some of the Radars earlier supplied to the customers. For an early introduction of some new technologies of customer interest, BEL ties up with reputed foreign companies for technology acquisition and tries to absorb the new technologies to provide life cycle support for such products including obsolescence management and subsequent product upgrades.

Fire Control Radars (Superfledermaus, SFM) is the first family of Radars based on value technology was manufactured by BEL under license collaboration from foreign vendor. These Radars have been subsequently upgraded to incorporate the then technology of Transistors/ICs as well as improvement in the performance level. These SFM families of Radars were succeeded by Flycatcher.

Flycatcher Radar, an Air Defence Weapon Control search and track radar backed by optronic tracking features was manufactured under license production form HAS, Holland. Subsequently, these Radars have been upgraded in-house, for Jam resistance, provided with Raster Scan colour display replacing conventional CRT tube display.

With an experience gained in the field of Radars, BEL, in close association with DRDO Labs, is in the process of introducing new Radars with the state-of-the-art technology. Some of the Radars which

are based on the Passive/Active Phased Array Technology are being concurrently produced at BEL, with the technology from LRDE Bangalore *viz*., Central Acquisition Radar (CAR), Weapon Locating Radar (WLR) and Battery Level Radar (BLR). Recently, BEL with DRDO Labs has taken up the development of Multi-Function Radar (MFR) based on Active Electronically Scanned Phased Array Technology, Radar performing Multi-task, Multi-function *viz*., Long Range Surveillance, Surface Search, Multitracking, Fire Control Capability and Missile guidance.

Over the years, BEL has established an extensive manufacturing and R&D infrastructure and facilities. Some of the specific infrastructure facilities set up at BEL are (i) antennas Test Site at Sohna, Haryana (ii) EMI/EMC Test facilities (iii) Environmental Test Facilities and (iv) Near Field Antenna Test facility for Phased Array Radars.

With the focused attention of R&D, BEL gives greater emphasis to proactively introduce cutting edge technology in hardware and software. Interaction with indigenous design agency like DRDO will be continued to introduce new generation products. Tie-ups with reputed foreign companies will also be continued to introduce state-of-the-art new products."

Tarang

6.18 Pertaining to the present status of TARANG project and regarding transfer of technology fees paid for this project before entering into this contract for transfer of technology from Akon and fees paid to Icon for obtaining, SKD, CKD, Gas Weeks entrans equipments as well as other facilities, the Ministry in their written reply stated that :—

> "The order for TARANG Mk IB was received on 8th September 2005. The completion of 336 systems is over 60 months. The total order value for TARANG project is Rs. 520 crores.
>
> Bharat Electronics was supplying TARANG Mk I Radar Warning Receiver (RWR) to Indian Air Force and this RWR was using Switched Filter Assemble (SFA) or Radio Frequency Unit (RFU) manufactured by recommended only M/s AKON for procurement of SFAs to BEL as they were approved for use after undergoing various tests by the designer. BEL, being the production agency for TARANG project, sourced this component from recommended vendor M/s AKON.

ToT & Technical Assistance

Sl.No.	Item	Period	Payment
1.	ToT	-	NIL
2.	**Training**		
	(a) Mandatory training of BEL engineers at AKON	6 to 8 months	$775/working day for a batch of 3 engineers
	(b) Further training if needed	As required	$775/working day for a batch of 3 engineers
3	**Technical assistance**		
	(a) Mandatory assistance by AKON in India	4 days per month for a period of 6 years	NIL
	(b) Extra assistance beyond 4 days if need	As required	US $ 8600/week and US $ 975/day above one week

6.19 The Ministry further informed the Committee that delivery of Tarang MK 1 for Jaguar (75 systems) was delayed due to delays in design finalization and flight trials.

Semi Conductors

6.20 BEL manufactures the following semi conductor devices *viz*., small signal devices, power devices, hybrid micro circuits and integrated circuits for use by Indian industry besides its own requirement. When asked to state the steps taken by BEL to produce indigenous semi-conductors to meet our own requirements, the Ministry in their written replies to the post briefing List of Points has stated :—

> "During mid 80's and 90's, BEL had made a proposal to upgrade the semi conductor manufacturing facilities to meet partly the country's requirement. The chip manufacturing facilities are highly capital intensive and BEL, on its own, was not in a position to invest because the project was economically unviable. However, BEL tried to get funding from the Government but it did not materialize. Today, in view of liberalization and availability of components with totally changed duty structure, BEL does not

find this investments in chip fabrication facilities, an economically viable project.

BEL is using facilities already established to design and manufacture semi conductor devices. However, BEL is pursuing the following new emerging technologies :—

(i) Micro Electro Mechanical Systems (MEMS)

(ii) Thermal Imaging (Infrared Detectors)

(iii) Quantum Well Infrared Detectors (QWIR)

(iv) Super bright LEDs (Light Emitting Diodes)"

Jammers

6.21 BEL has been manufacturing Jamming devices for military purposes and Jamming systems for jamming of "Remote Controlled Improvised Explosive Devices" (RCIED) for both Military and Civil applications. BEL has the capability to develop and manufacture jamming devices for Broadcast Radios. At present there is no proposal to manufacture these jamming devices. However, BEL is ready to supply these whenever requirements are received.

6.22 BEL has constantly been improving the technology of jammers to match technological complexities of IEDs. In this direction BEL has recently developed Multiradio pre-initiator type of jammers and is in the process of developing new jammers to address the perceived sophistication of IEDs. However, it is not possible to upgrade the existing devices and these are to be replaced.

6.23 When asked about the plan of action conceived by BEL to replace the existing devices of Jammers, the Ministry in their written replies stated :—

"BEL regularly develops newer versions of jammers for meeting the requirements of changing threats of RCIEDs. BEL has already supplied the newer version of jammers to some of the users.

The existing jammers cannot be upgraded to address newer threats as the technologies and circuits used are totally different. However, if the user decides that the existing jammers can be replaced by the newer versions, BEL is prepared to supply the newer jammers soon after getting the necessary orders from the user who has to get the necessary approvals from Cabinet Secretariat."

(iv) Attrition of engineers and technical staff

6.24 The Ministry of Defence informed the Committee that manpower planning is carried out in the Company after considering the Business Plans/Strategy taking into account the various projects being executed and future projects envisaged in relevant business areas. The Manpower plan is approved by the Board of Directors. The manpower Plan is reviewed annually for revision, if any. the Ministry further stated attrition of high-tech engineers from BEL is a very pertinent question. The details in respect of Engrs/Tech Staff/Officers who left BEL in the last 10 years are given below:

RESIG-NATION	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	TOTAL
Engrs	160	160	141	141	265	73	27	52	122	98	1239
T.staff	25	13	18	1	10	7	4	7	14	11	110

6.25 In the written replies submitted to the Committee, the Ministry stated that due to the opening up of economy, opportunities are growing outside and large number of lucrative jobs are available to attract BEL R&D engineers. The Ministry has taken the following measures to retain executives :—

a) Exit interviews are held to find out the actual reasons for leaving the Company. The feed back from the executives are analysed and suitable measures adopted.

b) With a view to retaining younger executives, the promotion policy was recently reviewed for their faster career growth.

c) The payment of perquisites and allowances have been regulated upto a maximum of 50% of basic pay and performance related payments are also made not exceeding 5% of the distributable profit of the Company as per extant Govt. guidelines.

d) R&D awards, Patent awards, Excellence awards have been instituted for rewarding significant contributions of executives.

e) Extensive training opportunities are provided in managerial and technology related areas.

f) Job rotation is being carried out for better exposure and for the executives to acquire varied experience for their career growth.

6.26 The Ministry has also stated the following policy level intervention to address these serious issues for retention of technocrats:—

1. Attractive Compensation to technocrats comparable to private sector.
2. Increase terminal benefits like gratuity.
3. Extension of pension benefits for PSUs employees.
4. Merger of 50% of Dearness Allowance with basic pay as in the case of Central Government employees.
5. Maximum limit for payment of perquisites (50% of basic pay) may be removed and PSUs may be allowed to decide perquisites based on their performance.

6.27 The CMD, BEL stated that the engineers who are leaving are from R&D area. When they join BEL, in the first three or four years, they leave, and once they are here for four or five years, the number of people who leave comes down.

6.28 When asked about the measures taken to control the present rate of attrition, the representatives of the Ministry of Defence stated :—

"It is a process, and there is no shortcut to this. We have to have more intake and we have to cater for these types of eventualities because with the opportunities arising all over the world as well as in India, it cannot be controlled. You know, Sir, in India we have been worried for the last so many years about the IIT engineers are going away to America, and brain drain is going on. In spite of that, we are managing.

Monetary benefits, unfortunately, are not in my hand, and you can never compete with the private sector on this. They get lakhs of rupees in this private sector and the Government service cannot pay that sort of money."

When asked about the mechanism like conditions of bond and providing incentives, perks and privileges, the representatives of the Ministry of Defence during oral evidence stated that "conditions/bonds are there. But they jump the bond."

6.29 When asked about the possibilities to appoint the engineers/scientists on contract basis with a good remuneration on three or four

year basis as followed in the foreign countries, the representatives of the Ministry of Defence during oral evidence stated :—

> "Our Department is also doing. What they are doing is that they are also giving projects sometimes to the outsiders. They are not the employees of the company; they are given a task to do. DRDO is doing; our company is also doing it; HAL is also doing it; BEL is also doing it."

6.30 The representatives further stated that :-

> "I think the concern is absolutely genuine and vital because what has happened is that ever since we have opened up, there is a distinct difference between the remuneration of foreign companies, foreign companies based in India, private companies dealing with foreign companies – that means, they are doing the work for the foreign companies at foreign rates – private companies and public sector. This kind of attrition has been going on since the early '90s when liberalization and all those things came. In fact, this kind of dichotomy is not only in India but also at the extreme end in the USA, which is the world's largest paying economy. Now, in India, with contract system or taking a project on contract, we say all right we would take so many people on contract basis and pay the best remuneration. When the job is completed, the contract is complete and they can go. This is one of the methods. Certainly, this is happening. It will have its pros and cons. The cons side would be, let us say, Bharat Electronics has 3000 engineers. They are working on the normal salary. They find people who are being taken on shorter terms and given 10 times more than their normal salaries. There is a little bit of difference."

6.31 When asked whether autonomy could help in controlling the attrition problems, the Defence Secretary during oral evidence stated:—

> "So, a greater autonomy also could be one of the answers. But I am sure all these things would be addressed continuously. In the changed environment, public sector will have to see all these things together. There is one things about BEL. In 1991, when India started disinvestment, at that time BEL was one of the companies which had done the disinvestment. Although it was a Defence company, it was allowed to disinvest."

(Recommendation No. 13)

Perspective Plan of BEL

6.32 The Committee note that BEL follows various effective steps in formulating long-term business plans. BEL follows the guidelines

of Department of Public Enterprise (DPE), which stipulates that the targets fixed should be realistic and growth oriented. The MoU target for Defence orders are negotiated on the basis of projections of the customer as well as ability of the company to execute the orders. The inputs regarding customer need are collected during interactions in institutional meetings, progress reviews with customers, interaction with DRDO business partners. However, the Committee are pained to note that BEL does not have access to the long-term perspective plan of the Armed Forces. The Committee further note that there is no direct user involvement in MoU target fixing.

The Committee are of the strong view that the perspective plan of BEL is an unrealistic proposition by knowing the customer need through institutional meetings and without access to long-term perspective plan of the Armed Forces and without direct user involvement in MoU target fixing. Therefore, the Committee strongly recommend that the Ministry/Armed Forces should make available the long-term perspective plan to BEL and involve the users directly through out the process so that the perspective plan of BEL will be realistic and growth oriented. Besides, the Committee desire that the perspective plan should also address the threat perception, both conventional and non-conventional, rapid technological changes and new innovations in defence technologies taking place world wide and intensify R&D activities through in house R&D and tie up with R&D institutions and foreign collaborations. The Committee further desire that BEL should constantly evaluate their product lines and improve its technologies and products in order to bring into the world standard and make its product cost effective.

(Recommendation No. 14)

Need for close examination of modernization/upgradation measures

6.33 The Committee note that BEL has been continuously modernizing its infrastructure to be in tune with the changing needs of the technology. Some of the new infrastructure have been established or are in the process of establishment in various units. The Committee further observe that order book position in some of the units of BEL is very grim. The orders from the Armed Forces has been drastically reduced from the year 2001-02 to 2005-06. Some of the units of BEL are lacking orders and 30 to 40 per cent of their capacity is lying idle. The export potential of BEL since last five years is not satisfactory. Therefore, the Committee strongly recommend that the Ministry should examine the available

infrastructure, modernization/upgradation already done and in view of the above problem areas the need for further modernization/ upgradation in all 09 units of BEL and should take corrective measures and inform the Committee regarding the action taken thereon within three months of the presentation of this report. The Committee feel that although modernisation is a continuous process, the Board should fix a time schedule for modernisation of each of the infrastructural unit and that should be strictly adhered to by BEL.

(Recommendation No. 15)

Status of major projects of BEL

6.34 The Committee are happy to note that in the field of sonars the country seems to be self-reliant. In the field of radar, BEL has the infrastructure and capability to design and manufacture radars. The Committee further note that BEL in close association with DRDO labs is in the process of introducing new radars with the state-of-the-art technology. In this connection, BEL has also tied up with reputed foreign companies to develop high-end technologies. However, the Committee during examination of Demands for Grants 2006-07 were dismayed to note that some of the ships inducted in Navy are operating without radar and most of the radars fitted on ships are imported. Therefore, the Committee desire that the available infrastructure with BEL must be properly utilized and in this connection reputed private sector firms having relevant expertise must be involved in the designing and manufacture of radars to attain indigenization in the field of radars.

In regard to jammers, the Committee note that BEL is constantly improving the technology of jammers to match technological complexities of IEDs and BEL has already supplied the new version of jammers to some of the users. The Committee are further informed that on demand of users the existing jammers can be upgraded and BEL is prepared to supply the new jammers soon after getting the necessary orders. Therefore, the Committee recommend that BEL should constantly upgrade the jammer devices as per the changing requirements and supply the same to the users at the earliest.

The Committee observe that during the mid 80's and 90's BEL had a proposal to upgrade the semi-conductor manufacturing facilities to meet the country's requirement. As the manufacture of semi-conductor was not economically viable for BEL and non-availability of Government funding, manufacture of semi-conductor did not

materialize. However, BEL is using facilities already established to design and manufacture semi-conductor devices. Therefore, the Committee recommend that the Ministry of Defence must provide adequate financial assistance to BEL in pursuing other new emerging technologies like micro electronic mechanical systems, thermal imaging etc. so that Armed Forces can avail benefits from it.

The Committee desire that BEL and Ministry of Defence should have close monitoring on the ongoing projects to strictly adhered to the time schedule for their completion and delivery to the Armed Forces and they must closely watch the percentage of their achievement against the targets fixed.

(Recommendation No. 16)

Need to retain R&D engineers and technical staff

6.35 The Committee note that the number of engineers and technical staff resigning in BEL since 1996-97 to 2005-06 are 1239 and 110 respectively due to opening up of economy and lucrative job opportunities available outside BEL. The Committee are distressed to note that majority of engineers who are leaving BEL are from R&D area and they leave BEL after three-four years of joining as a result major R&D projects are getting delayed. The Committee also note that the Ministry has taken a number of initiatives to retain the executives. Besides, the BEL has sought some policy level intervention to address these serious issues for retention of technocrats like attractive compensation; increase terminal benefits, extension of pension, merger of 50% Dearness Allowance etc.

The Committee, therefore, strongly recommend that urgent attention of the Government must be drawn towards the above policy level interventions and the pay structure of its engineers must be adequately modified. The Committee desire that the Ministry should take immediate steps to offer attractive job package to R&D Engineers which can be comparable to the best package available to them in job Market. They should also be provided on the job training to update their knowledge. These measures will facilitated to retain them and minimize the delayed R&D projects which cause a lot of concern to the nation and huge sufferings to the Armed Forces.

The Committee further desire that to minimize delay in the R&D projects the Ministry must strictly adhere the policy of not allowing the R&D engineers to leave their job till the completion of the projects. The BEL must also make concerted efforts to document the

R&D achievement step by step as they make progress so that the new incumbent who may take up the R&D project from where the predecessor had left so that the projects are not delayed. The Committee feel that the salary and other benefits of R&D engineers should be performance based. in order to attract young and talented personnel. For retention of R&D engineers the Committee further desire that the Government should resort to strong action against those R&D engineers who are leaving BEL midway of the projects assigned to them. They should be debarred to join any public sector undertakings and Government Organizations. The Committee also desire that the Ministry should frame a recruitment policy clearly stipulating service conditions that the engineers joining the company must sign a bond of compulsory service in the Company for at least eight to ten year and in case of breach of the bond, the expenditure incurred on their job specific training would be recovered from them.

The Committee are of the strong view that scientist and R&D engineers are the actual brain of the projects. Therefore, the Committee further wish to recommend that to attract the young and experienced scientist, they can be appointed on contract basis with a good remuneration on four to five years basis. While offering incentives/promotional avenues and other facilities to the R&D Engineers, the Government must take into account their individual performance and contribution to the overall growth of the company. In case of excellence performance they may be given acceleratory promotions. The Committee further recommend that the Government should extend royalty to the engineers for their original R&D work done by them and any product developed thereon.

CHAPTER VII

RESEARCH & DEVELOPMENT AND QUALITY ASSURANCE

7.1 The R&D focus and R&D organisation of BEL stated in the year 1963. Over the years, the R&D set up has grown and matured to adequately address the new technology areas. BEL has evolved a three-layer set up to effectively address the technology and product needs of the customers. All the 9 manufacturing units have their own unit Development and Engineering (D&E) groups developing new products in their respective areas. Two Central Research Laboratories (CRLs) at Bangalore and Ghaziabad are set up for undertaking research in futuristic areas with a view to identify and realize enabling technologies relevant to the company's products. Central D&E group at Bangalore is working to develop specialized technology module for the unit D&E groups. More than 1600 qualified, scientists and support staff are presently deployed in R&D by the company. Apart form in-house Research & Development of new products, BEL is having a strong tie-up with DRDO Laboratories and other national design agencies for introducing new products continuously. In addition to this, BEL has ToT tie-ups with the foreign vendors for some selected products.

7.2 Following are some of the major on-going R&D projects for the Defence Services at BEL:—

Sl. No.	Project	Status	Likely PDC for Productionisation	Projects started
1	2	3	4	5
1.	Weapon Locating Radar (WLR)	Under user assisted evaluations at Field	2007-08	2002-03
2.	Battery Level Radar — (RAJENDRA-III)	Under system level integration	2008-09	2002-03
3.	Central Acquisition Radars (CAR) [ROHINI & REVATHI]	Under development	2008-09	2006-07
4.	Low Level Light Weight Radar (LLLWR)	Under development 2002-03	2007-08	2004-05
5.	Upgradation of Reporter Radar	Under development	2009-10	2002-03

1	2	3	4	5
6.	Upgradation of Schilka Radar	Under development	2007-08	2005-06
7.	SV 2000 Radar	Under user trials & evaluations	2007-08	2000-01
8.	Upgraded Naval Fire Control System (LYNX-U1)	Under development	2007-08	2003-04
9.	Combat Management Systems (CMS) for Ships	Under development	2007-08	2004-05
10.	Battlefield Surveillance System (BSS)	Under user trials	2006-07	2002-03
11.	Artillery Command & Control System (SHAKTI)	Under user trials	2007-08	2002-03
12.	Integrated Air Command & Control System (IACCS)	Under development	2007-08	2005-06
13.	Air Defence Control & Reporting System (ADC&RS)	Under development	2007-08	2005-06
14.	Tactical Communication System (TCS)	Under development	2007-08	2004-05
15.	CDMA Encryptor	Under development	2007-08	2004-05
16.	Upgraded Semi-ruggedised Automatic Exchange (ULSB MK-III)	Under evaluation	2007-08	2003-04
17.	L-70 Gun Upgrade	Under Trials & evaluation	2008-09	2002-03
18.	Zu-23 Gun Modernisation	Under Trials & evaluation	2008-09	2002-03
19.	KITE EW System (MK-II)	Under development	2007-08	2006-07
20.	Advanced Ground Control Station for NISHANT	Under development	2006-07	2005-06
21.	Night Vision Devices (NVD for MFC)	Under development	2006-07	2005-06

7.3 The Ministry in their written reply stated the following constraints in timely completion of the projects:—

(a) Delays in Trials & Evaluation of equipments due to timely availability of user provided items like vehicles, aircrafts, ships etc.

(b) Changes in the scope due to feedback generated by the users during the evaluation.

(c) R&D engineers leaving BEL also delays the projects.

7.4 When asked how BEL is taking help from DRDO in R&D activities to set up a state-of-the-art manufacturing, testing and quality assurance facilities, the Ministry in their written replies stated :—

"BEL has established effective methodologies to work with DRDO for productionisation of products and also for joint development of products to meet the needs of Defence Forces.

R&D divisions of BEL start interacting with the concerned DRDO Labs from the early stages of design of a product and provide the DRDO Lab various supports like taking up of development of some sub-systems for the main system, concurrent engineering etc. to speed up the design phase and associate with DRDO Labs for the trials & evaluation stages. Association of BEL R&D Engineers with DRDO in the early stages of a product development at DRDO helps BEL to upgrade any manufacturing, testing & quality assurance facilities required at BEL if the product is cleared for production at BEL after the evaluations. One of the examples is setting up of Near Field Test Facility for testing of Phased Array Radars."

7.5 When asked whether the Ministry is planning to delegate the power of DRDO to BEL in regard to the R&D activities to set up the state-of-the-art manufacturing and testing and quality assurance facilities, the Ministry in their supplementary replies stated:—

"There are no such proposals of delegating powers of DRDO to BEL by the MoD with regard to R&D activities.

Over the years, BEL has set up facilities which are required for manufacture of various products/equipments for Defence. These facilities are also being utilized by BEL for in-house R&D activities and for DRDO development programmes where BEL is asked to take up development of sub-systems.

BEL's view in this regard is that DRDO may consider giving more and more systems/sub-systems development and manufacturing activities to BEL. This will allow sharing of BEL's facilities for DRDO's development work and also a faster realization of final product to defence customers."

The R&D expenditure

7.6 The following are the R&D expenditure of BEL during the last five years.

(Rs. in crore)

Year	Expenditure
2001-02	89.6
2002-03	108.7
2003-04	130.6
2004-05	127.1
2005-06	130.1

7.7 The following are the turnover from indigenous products

(Rs. in crore)

Year	Turnover
2001-02	1234
2002-03	1605
2003-04	1771
2004-05	1937
2005-06	2568

7.8 The percentage of revenue earned during the last three years from DRDO, BEL in-house research and Transfer of Technology (ToT) are as follows:—

Year	DRDO	In-house Research of BEL	ToT
2004-05	17%	43%	40%
2005-06	36%	37%	27%
2006-07(estd.)	27%	48%	25%

Quality assurance

7.9 Bharat Electronics has been addressing the problem of survival in an environment of severe competition and an intense demand for Quality goods and services. This has thrown up the need for TQM, which would achieve:

- Product/Service Quality
- Low manufacturing Cost
- Shorter Lead times
- Better Customer Rapport/Support
- Low reaction—Time to the dynamic market.

7.10 As a first step to demonstrate the commitment to Quality and Environment, the CMD has promulgated the Quality Policy & Objectives and Environmental Policy & Objectives. A commitment to deliver enhanced value to our customers through continual improvement of our products and processes is the 'Tag Line' in our Quality policy.

7.11 BEL adopted TORQUE (Total Organisational Quality Enhancement) an acronym equivalent to TQM, in achieving continuous improvement in Quality, Cost, Delivery & Safety aspects with the aim of giving full satisfaction to customer. It encompasses the entire cycle of manufacturing process starting from improvement in Quality of design and proceeds with the improvement in Quality in conformance & Performance, which results in Customer Satisfaction. Products are designed and manufactured to meet the stated and implied needs of the Customer by adopting National/International standards like JSS 55555/MIL/DEF/IPT 1001A/QM 333 to the extent that the requirements of these are mutually agreed with the customer. The Design Manual and the Company Standards are used as guiding documents in design and manufacturing processes. A full fledge QA department is set up in all Units to ensure all aspects relating to quality management systems & procedures are effectively implemented and adhered to.

7.12 Standardisation and Quality are two inseparable parts of TQM process and they have a complementary role. The Corporate Standards Division with over 4 decades of its activity has evolved more than 4000 standards, thus providing effective support for design and manufacturing and vendor development. These standards have since been captured on a CD for ready availability/reference to all concerned.

7.13 The foundation for the overall structure for managing Quality is the Corporate Steering Committee on TORQUE comprising the CMD as the Chairman, all Directors as members and GM (TORQUE) as Member secretary. The function of the Corporate Committee is to:

- Give Guidance to the Units
- Monitor the Quality Improvement Process in the Units.

7.14 All Units/SBU/Divisions have steering Committees on TORQUE Chaired by Unit/SBU heads and all functional Heads—D&E, Manufacturing, personnel, Finance, Services as members.

7.15 The function of these steering committees is to lay down policies and plans for Quality Improvement in the Unit/SBU covering:

- QCC
- Suggestion Scheme
- Six Sigma
- CII EXIM Bank Business Excellence
- ISO Sustenance (ISO-9001: 2000, ISO 14001:2004—All Units/ SBUs / Divisions of BEL are certified for these standards)
- Educational & Training needs at all levels
- Restructuring of Organisation for implementation of TORQUE
- Analyse reports on TORQUE parameters emanating from Units/SBUs and action for improvement
- Monitor the MR meetings, Internal audits (IQSA & IEMSA), analyze non-conformities, drive corrective/preventive action and ensure sustenance if ISO
- Customer Satisfaction Surveys and Employee satisfaction Surveys and action based on the feed back from the survey reports
- Self certification of products.

Government assistance for strategic technologies

7.16 The Committee are informed that BEL has requested the Government for funding for the following strategic technologies:

(i) Infra Red Detectors & Detector Dewar Cooler Assembly (Rs. 250 Cr.)

(ii) Micro Electro Mechanical Systems (MEMS) (Rs. 100 Cr.)

(iii) Multi-junction Gallium Arsenide based Solar Cells (Rs. 155 Cr.)

(iv) Super Gen Image Intensifier Tubes & Micro Channel Plates. (Rs. 150 Cr.)

7.17 It has been informed that no such funds have so far been received by BEL. In this regard when asked to state how the important projects of BEL will take up and the reasons communicated by the planning Commission for not providing the fund, the Ministry in their written replies stated :—

> "It may kindly be noted that development of stand alone technologies in the Defence Sector is the responsibility of DRDO whereas application of the same is done by the Industry.
>
> In the 'Make' procedure as per DPP 2006, if BEL is identified as the Prime Contractor in any project, funds can be provided for development of the product or part of the product and also for enhancing the designs, testing and manufacturing facilities where required.
>
> Government has no funds for directly funding Industry for development of stand alone technologies, but profit making companies like BLE can source such development and research work from internal resources for which no government approval is required."

Request by BEL for Government funding for some of the strategic technologies

7.18 In response to a written query regarding status of Government funding for some of the strategically important projects, the Ministry in their written replies stated as under:—

> "Government funding was sought for the following strategically important projects, which were found not economically viable to take up development using BEL's own funds:—
>
> (a) Infra Red Detectors & Detector Dewar Cooler Assembly (Rs. 250 Cr.)
>
> (b) Micro & Nano Technology (Rs. 100 Cr.)
>
> (c) Multi-junction Gallium Arsenide based Solar Cells (Rs. 155 Cr.)

(d) Super Gen Image Intensifier Tubes & Micro Channel Plates (Rs. 150 Cr.)

Although efforts have been made by the Ministry in this direction no funding has been received so far."

7.19 During the study visit of the Committee to BEL, Bangalore, the representatives of BEL has sought Government funding for the following projects:—

(a)	MEMS	—	Rs. 95 crores
(b)	Multi-junction Gallium Arsenide based Solar Cells	—	Rs. 155 crores

(Recommendation No. 17)

Research & Development

7.20 The Committee are happy to note that over the years, BEL has grown and matured adequately to address the new technological areas. BEL is spending 4-5 per cent of its turnover in R&D activities. All the 9 manufacturing units have their own unit development and engineering groups to develop new products in their respective areas. Two Central Research Laboratories at Bangalore and Ghaziabad are set up for undertaking research in futuristic areas. Apart from in-house Research & Development of new products, BEL is having strong tie-up with DRDO laboratories. In addition to this, BEL has ToT tie-ups with foreign vendors for some selected products. However, the Committee are further informed that there is delay in completion of some of the major ongoing R&D projects for the Defence services at BEL. The delays are due to trials and evaluation, changes in scope of the project due to feedback generated by users during the evaluation and R&D engineers leaving BEL. In view of the above, the Committee strongly recommend that BEL must take urgent step to stop the brain drain by taking corrective measures and provide attractive incentives at par with the private sectors to the R&D engineers who are the brain behind the progress of BEL. Further, the Committee desire that the time period for evaluation at all levels should be reduced for the timely completion of the project. The Committee further desire that the Ministry should chalk out a well considered plan in order to monitor the development of various projects being undertaken by BEL and accountability for the delay in completion schedule must be fixed on the engineers/officials, in-charge of the project. The BEL should make clear cut assignment of project related jobs to officials at the start of the project. The

Committee further desire that the option of involving private sector in the various projects must be explored at the beginning itself.

(Recommendation No. 18)

Need for extending financial help for undertaking some of the strategic technologies

7.21 The Committee are happy to note that BEL has played a significant role in meeting the requirements of Armed Forces for electronic communication and Radar equipment. The Company has developed indigenously a number of products with active support of customers and DRDO laboratories. The Company has also been making continuous efforts towards technology upgradation and identifying new technologies and new products jointly or in collaboration with Defence/National Laboratories and Institutes. The Committee note that for establishment of some of the strategic technologies *inter-alia* Infra-Red Detectors & Detector Dewar Cooler Assembly, Micro Electro Mechanical Systems (MEMS), Multi-junction Gallium Arsenide based Solar Cells and Super Gen Image Intensifier Tubes & Micro Channel Plates, BEL has sought financial assistance from the Government. The Standing Committee in their Ninth Report, had also recommended for grant of financial assistance to these projects. The Committee are constrained to note that till now the same assistance has not been extended to BEL, as a result, vital strategic projects will not be materialized and the same cannot be extended to the Armed Forces. Besides the above projects, BEL has also required Government assistance for MEMS and Multi-junction Gallium Projects.

Since limited resources are available with the Company and huge funds are required for meeting the expenditure on these strategic projects, the Committee strongly recommend that the Government must consider extending help to BEL for their timely completion and extend the benefits to the Armed Forces.

(Recommendation No. 19)

Delegation of systems/sub-systems development and manufacture activities powers of DRDO to BEL

7.22 The Committee observe that over the years, BEL has set up research facilities required for manufacture of various products/ equipment for Defence. These facilities are being utilized by BEL for in-house R&D activities and for DRDO development programmes

where BEL is asked to take up development of sub-systems. The Committee are informed that as per BEL view points DRDO may consider giving more and more systems/sub-systems development and manufacturing activities to BEL. This will allow sharing of BEL's facilities for DRDO's development work and also a faster realization of final products to defence customers. In view of the above, the Committee wish to recommend that the Ministry should examine this aspect very carefully and may consider the delegation of systems/ sub-systems development and manufacturing activities of DRDO to BEL accordingly.

CHAPTER VIII

PRIVATE SECTOR PARTICIPATION

8.1 In regard to specific measures/steps have been taken by the Company for increasing the role of private Industries in defence production in consultation with the Ministry of Defence, the Ministry of Defence, in its written replies informed the Committee that :—

> "BEL has been promoting small and medium scale industries right from the beginning. In addition to ancillary units, BEL has got a good number of private industries involved with BEL. To meet the manufacturing requirements, BEL sources electronic sub-assemblies, electronic sub-systems, mechanical/electromechanical components and sub-systems, Diesel Generating Power Supplies, Air conditioners, Battery Chargers, Hand Sets, Head Sets etc. There are more than 5000 vendors involved with all the Units of BEL. During the last three years, the volume of outsourcing by BEL has been Rs. 399 crores during 2003-04, Rs. 885 crores in 2004-05 and Rs. 737 crores in 2005-06. The outsourcing done during 2005-06 is around 20% of its turnover.
>
> In order to increase the role of private industries in defence production, BEL had conducted vendor meet to attract private parties in indigenization of various components and raw materials. BEL had also participated in various Govt./Private Industries' meets organized by various industrial houses. During such programmes, BEL had exhibited components, sub-assemblies, imported parts, items where the company is seeking the help of private industries."

8.2 When asked whether BEL has shared critical and classified technologies for production and raw material of Defence equipment with the private sector, the Ministry of Defence in their supplementary replies stated:—

> "In view of security reasons and commercial importance of critical and classified technologies, items using such technologies are not outsourced. BEL has infrastructure to manufacture such items. However, components, materials and sub-assemblies required for these equipments are outsourced to private sector. Based on the overall specifications of the equipments, specifications and requirements of these items are prepared and given to vendors. The information is provided to vendors on need to know basis."

8.3 Regarding outsourcing of various sub-systems, both medium and low take components to the private sectors, name of the private sector to whom the projects were given and the cost effectiveness achieved in the manufacturing activities and the criteria for outsourcing to a private industry, the Ministry in their written replies stated:—

> "At the time of project development stage itself, the vendors are selected for various assemblies/sub-systems, either by BEL or by the Design Agency (DRDO). The vendors will develop the product and thus will become the supplier for the production batches when orders are received.
>
> During the production phase also, BEL develops vendors to meet the needs of indigenisation, multiple, sources, additional capacity and special machines/processes etc."

8.4 The major criteria for outsourcing to private sector are given below:—

- Competencies available with vendor
- Infrastructure facilities available with vendor
- Design capabilities
- Quality Practices followed
- Cost Competitiveness

BEL outsources primarily to augment capacities, use design capabilities of vendor for faster development and use infrastructure available with private vendors to get items and services at competitive prices. The benefits available are integrated with the pricing of the products.

Some of the vendors who have been developed for various ongoing projects are given below:

MBTUs	—	M/s. Badawe Engineering
Liquid Cooling Unit	—	M/s. Pair Engineering
Pedestal, Rotating Platform	—	M/s. Involute
Racks	—	M/s. DINRAC
Super Component	—	M/s. Astra Microwave Products Flic Microwave
Antenna	—	ACD Communication

Software Development	—	SOROKA SOFT, CMC, MELTRONIX
High Voltage PSU	—	LNT, Versabyte
Hydraulic Mast	—	Hydraulic Actuation
Stabilised Platform	—	L&T
Launcher	—	L&T, Tata Power
Mobile Power Source Vehicle	—	L&T
Low Power Microwave Modules	—	Astra Microwave Products

(Recommendation No. 20)

Urgent need for involvement of private sector

8.5 The Committee observe that BEL has been promoting small and medium scale industries right from the beginning to meet its manufacturing requirements of electronic sub-assemblies, sub-systems, mechanical and electro-mechanical components and sub-systems, etc. This will primarily augment the capacities, use design capabilities of vendor for faster development and optimum use of infrastructure available with private vendors to get the items and services at competitive prices. The Committee, are, however distressed to note that BEL is hesitant to outsource the items using critical and classified technologies due to security reasons and commercial importance. The Committee feel that non-involvement of private companies in manufacturing of items of critical/classified technologies is an explicit indication of its monopolistic attitude in Defence production which will ultimately lead to weakening the existing R&D base in the country and expose itself in times of emergencies/war situations. The Committee are of the strong view that the private sectors should be encouraged to come up a particular level in order to share responsibility with the public sector undertakings as the same will strengthen the domestic R&D base to ensure timely and sustained supply of equipment to the Armed Forces.

(Recommendation No. 21)

Concluding Observations/Recommendations

The Committee have made an in-depth study of the functioning of BEL from various standpoints *viz*. organizational structure, performance, capacity utilization and supplying products to Defence Forces, modernization, research and development, indigenization and

private sector participation and thus made well-considered recommendations under various chapters for improvement. The Committee feel that BEL plays a crucial and vital role for the national security of the country and therefore its functioning should be organised and re-structured to make it an independent and autonomous R&D body on the line of ISRO and Brahmos. In this regard, the Committee wish to stress upon that DRDO must facilitate the working of BEL in various projects and it should refrain from being a controlling authority of BEL projects and the Ministry must ensure to avoid bureaucratic red tapism. The Committee desire that total leadership should be given to BEL to work on the corporate lines so as to enable it to raise funds from domestic as well as external markets. It should intensify its R&D projects and diversify its production to meet the requirements of both defence and civil markets as per the rapid scientific and technological advancement. This will further facilitate BEL to produce high-end technologies to attract the export market. In this regard, the Committee wish to recommend that for a better functioning of BEL, its performance must be reviewed by an independent body.

NEW DELHI;
12 *February,* 2007
23 *Magha,* 1928 *(Saka)*

BALASAHEB VIKHE PATIL,
Chairman,
Standing Committee on Defence.

APPENDIX

MINUTES OF THE FOURTH SITTING OF THE STANDING COMMITTEE ON DEFENCE (2006-07)

The Committee sat on Wednesday the 4th October, 2006 from 1100 hrs. to 1230 hrs. in Committee Room 'B', Parliament House Annexe, New Delhi.

PRESENT

Shri Suresh Kalmadi — *In the Chair*

MEMBERS

Lok Sabha

2. Shri Milind Deora
3. Shri Santosh Kumar Gangwar
4. Shri Ramesh C. Jigajinagi
5. Dr. K.S. Manoj
6. Shri Adhalrao Shivaji Patil
7. Shri Shriniwas Patil
8. Shri Raju Rana
9. Dr. H.T. Sangliana
10. Shri Mahadeorao Shiwankar
11. Shri Manvendra Singh
12. Shri Balashowry Vallabhaneni
13. Shri Rajesh Verma

Rajya Sabha

14. Dr. Farooq Abdullah
15. Shri Abu Asim Azmi
16. Shri R.K. Dhawan
17. Smt. N.P. Durga
18. Shri K.B. Shanappa
19. Shri Lalit Suri
20. Smt. Viplove Thakur

SECRETARIAT

1. Shri S.K. Sharma — *Additional Secretary*
2. Shri S. Bal Shekhar — *Joint Secretary*
3. Shri R.C. Kakkar — *Deputy Secretary*
4. Shri D.R. Shekhar — *Under Secretary*

List of Representatives from Ministry of Defence

1. Shri Shekhar Dutt	—	Defence Secretary
2. Shri K.P. Singh	—	Secretary (DP)
3. Dr. M. Natarajan	—	SA to RM
4. Shri V.K. Misra	—	Secretary (Def. Fin.)
5. Shri S. Banerjee	—	DG (ACQ)
6. Shri K.P. Lakshamana Rao	—	FA (ACQ)
7. Shri N. Sitaram	—	CCR&D (ECS)
8. Shri Ranjan Chatterjee	—	JS (HAL)
9. Shri Mohd. Haleem Khan	—	Addl. FA (H) & JS
10. Shri P. Surendran	—	Director (SY)
11. Shri M.S. Seetharaman	—	Director (Finance/PSU)

Bharat Electronics Ltd. (BEL)

1. Shri Y. Gopala Rao	—	CMD (BEL)
2. Shri P.R.K. Haragopal	—	Dir.Fin. (BEL)
3. Shri V.V.R. Sastry	—	Dir. (Marketing) (BEL)
4. Shri M.K. Agarwal	—	Dy. Manager (IT) (BEL) (as supporting staff)

Services Headquarters

1. Air Mshl. A.K. Nagalia	—	DCAS
2. Lt. Gen. Dilip N. Desai	—	DG Inf. System
3. Lt. Gen. S.P. Sree Kumar	—	Signal Offr. in Chief
4. R. Adml. Ganesh Mahadevan	—	ACOM IT & S
5. Col. S.L. Phirke	—	Dir. Sig.-5

2.In the absence of Hon'ble Chairman the Committee unanimously chose Shri Suresh Kalmadi, M.P. and Member of the Committee to act as Chairman for that sitting under rule 258(3) of the Rules of Procedure and Conduct of Business in Lok Sabha. The Chairman then welcomed the Members and representatives of Ministry of Defence to the sitting of the Committee. The Chairman thereafter requested the representatives of the Ministry to brief the Committee on the subject 'In-depth Study and Critical Review of Bharat Electronics Limited (BEL)' and also drew their attention to the Direction 58 of the Directions by the Speaker, Lok Sabha regarding maintaining confidentiality of the deliberations of the sitting.

3. In the briefing the representatives of the Ministry informed the Committee that the core area of production BEL, was production of electronics and communication equipment. It was established in 1954 and has nine operating units, one subsidiary company *i.e.* EBL optronics devices and two joint ventures companies GE & BE. The supply of the company to Defence Services was around 86 per cent of its turnover. It's spending on R&D activities was highest among all the companies in terms of percentage of turnover spending on R&D activities. It made a profit of Rs. 583 crore after paying tax which was an increase of 30.62 percent over the previous year. The Company remained in active discussion with foreign company for technology transfer. It has been trying to make a foray into civil market also. BEL got a contract for the supply of integration, annual maintenance and facility management of the State of the Art call data record based convergent billing system for MTNL Delhi and Mumbai. It also procured an order from the Army for Rs. 126 crore to set up a test bed for CDMA based communication work.

4. The Representative of the Ministry thereafter requested the Chairman to permit CMD, BEL to give a small power presentation. The Chairman agreed to the request.

5. CMD BEL then made a power presentation highlighting the functioning and achievements, of BEL. Thereafter Members of the Committee sought clarifications on various issues *viz*. functioning of electronic voting machines, Night Vision Devices, Order Book, indigenisation, radio jamming devices, IEd Jammers, provision of State of the Art products, functioning of the Company and its overseas offices in New York and Singapore, set up for cost effective sourcing and components of sub-assemblies expansion of the Company activities in Civil Market etc. The Representatives of the Ministry and BEL responded to the above queries. Chairman also directed the Representative of the Ministry to furnish the replies to the points for which information were not readily available with them.

6. A copy of the Verbatim proceedings has been kept on record.

7. The Committee then adjourned to meet again on 13.10.2006 at 11 hrs.

MINUTES OF THE ELEVENTH SITTING OF THE STANDING COMMITTEE ON DEFENCE (2006-07)

The Committee sat on Tuesday the 12th December, 2006 from 1500 hrs. to 1700 hrs. in Committee Room 'D', Parliament House Annexe, New Delhi.

PRESENT

Shri Balasaheb Vikhe Patil — *Chairman*

MEMBERS

Lok Sabha

2. Shri S. Bangarappa
3. Shri Milind Deora
4. Shri Ramesh C. Jigajinagi
5. Shri K.S. Manoj
6. Shri Shriniwas Patil
7. Dr. H.T. Sangliana
8. Shri Manvendra Singh

Rajya Sabha

9. Dr. Farooq Abdullah
10. Shri Abu Asim Azmi
11. Shri R.K. Dhawan
12. Smt. N.P. Durga
13. Shri K.B. Shanappa
14. Smt. Viplove Thakur

SECRETARIAT

1. Shri S. Bal Shekhar — *Joint Secretary*
2. Shri R.C. Kakkar — *Deputy Secretary*
3. Shri D.R. Shekhar — *Under Secretary*

List of Representatives from Ministry of Defence

1. Shri Shekar Dutt	—	Defence Secretary
2. Shri K.P. Singh	—	Secretary (DP)
3. Shri V.K. Misra	—	Secretary (Def. Fin.)
4. Dr. M. Natarajan	—	SA to RM
5. Shri A.K. Jain	—	Addl. Secy. (J)
6. Shri P.K. Rastogi	—	Addl. Secy. (DP)
7. Shri N. Sitaram	—	CCR&D (ECS)
8. Smt. Kiran Chaddha	—	JS (X)
9. Shri Alok Perti	—	JS (SY)
10. Shri Y. Gopala Rao	—	CMD (BEL)
11. Shri V.V.R. Sastry	—	Dir. (Marketing) (BEL)
12. Shri P.R.K. Hara Gopal	—	Dir./Fin. (BEL)
13. Shri G.S. Malik	—	Director (ECS)
14. Shri S.K. Mehta	—	Dir. (R&D) (BEL)

Armed Forces Headquarters

1. V. Adml Nirmal Verma	—	VCNS
2. Air Mshl AK Nagalia	—	DCAS
3. Lt. Gen. Z.U. Shah	—	DCOAS (P&S)
4. Lt. Gen. Sreekumar	—	SO-in C
5. Maj. Gen. A.K. Mehra	—	ADGWE
6. Rear Adml. Ganesh Mahadevan	—	ACOM (IT&S)
7. Rear Adml. R.K. Dhowan	—	ACNS (P&P)
8. Air Cmde S.S. Gunashekar	—	Offg. ACAS (Eng. B)
9. AVM N Vijaya Kumar	—	ACAS (FP)
10. AVM KM Rama Sundara	—	ACAS (Systems)
11. Cmde. P.A. Narayan	—	HQ IDS

2. At the outset, Hon'ble Chairman welcomed the Members to discuss the issues raised during the study tour of the Committee to Mumbai, Cochin and Bangaluru from 14 to 19 November, 2006. Then the Members endorsed the important points raised in the draft tour notes ciruclated to them.

3. The Committee then took oral evidence of the representatives of Ministry of Defence on the subject 'In-depth Study and Critical Review of Bharat Electronics Limited'. During the discussion, the Members putforth the following points:

(i) Feelings of Armed Forces about the supply of products by BEL and their quality and competitiveness in comparison to the equipment used by the neighbouring countries.

(ii) Number of cases of delay in supply and the reasons thereof and sufferings of the Armed Forces due to such delays and efforts made by the Ministry to reduce these delays.

(iii) Attrition of Engineers from BEL and possibility of appointment of engineers on contract basis.

(iv) Evasive replies furnished by the Ministry of Defence to all the post briefing List of Points and they desired that candid written replies may be furnished to them.

(v) Single vendor system, offset clause and technology transfer.

(vi) Efforts being made by BEL for technological upgradation at least to the level of satisfaction of the Armed Forces.

(vii) Clear cut division of business at the highest level in the BEL to look after production for Armed Forces and civilians.

(viii) Research & indigenous development of BEL.

(ix) Overall upgradation programme of BEL.

(x) Under utilization of capability of some of the units of BEL due to lack of orders.

4. The representatives of the Ministry of Defence answered the queries one-by-one and on certain points they assured to furnish the written replies later on.

5. The Verbatim Record of the proceedings was kept.

The Committee then adjourned.

MINUTES OF TWENTIETH SITTING OF THE STANDING COMMITTEE ON DEFENCE (2006-2007)

The Committee sat on Monday, the 12th February 2007 from 1400 hrs. to 1430 hrs. in 'Main' Committee Room, Parliament House Annexe, New Delhi.

PRESENT

Shri Balasaheb Vikhe Patil—*Chairman*

MEMBERS

Lok Sabha

2. Shri S. Bangarappa
3. Shri Santosh Kumar Gangwar
4. Dr. K.S. Manoj
5. Shri Asaduddin Owaisi
6. Shri Adhalrao Shivaji Patil
7. Shri Mahadeorao Shiwankar
8. Shri Rajesh Verma

Rajya Sabha

9. Dr. Farooq Abdullah
10. Shri Abu Asim Azmi
11. Shri R.K. Dhawan
12. Smt. N.P. Durga
13. Shri K.B. Shanappa

SECRETARIAT

1. Shri P.K. Bhandari — *Joint Secretary*
2. Shri Gopal Singh — *Director*

2. At the outset, Hon'ble Chairman welcomed the members to the sitting of the Committee. The Committee, therefore, considered the two draft reports on the subjects 'Bharat Electronics Limited (BEL)'

and 'Hindustan Aeronautics Limited (HAL)' and adopted the same with some additions/modifications as suggested by the members.

3. The Committee then authorised the Hon'ble Chairman to finalise the reports and present the same to the Parliament.

The Committee then adjourned.