

**Report of the
Comptroller and Auditor General of India**

for the year ended March 2016

**Union Government
(Defence Public Sector Undertakings –
Ministry of Defence)
Report No. 19 of 2017**

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PREFACE

1. The accounts of Government Companies set up under the provisions of the Companies Act (including Companies deemed to be Government Companies as per the provisions of the Companies Act) are audited by the Comptroller and Auditor General of India (CAG) under the provisions of Section 143(6) of Companies Act, 2013. The accounts certified by the Statutory Auditors (Chartered Accountants) appointed by the CAG under the Companies Act are subject to the supplementary audit by CAG whose comments supplement the reports of the Statutory Auditors. In addition, these Companies are also subject to test audit by CAG.
2. Reports in relation to the accounts of a Government Company or Corporation are submitted to the Government by CAG under the provisions of Section 19-A of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971, as amended in 1984.
3. The Audit Report for the year 31 March 2016 contains one Performance Audit and individual audit observations relating to CPSEs under the control of Ministry of Defence. Instances mentioned in this Report are among those which came to notice in the course of audit for the period 2015-16 as well as those which came to notice in earlier years. Results of audit of transactions subsequent to March 2016 in a few cases have also been mentioned.
4. All references to 'Companies or CPSEs or DPSUs' in this Report may be construed to refer to 'Central Government Companies' unless the context suggests otherwise.
5. The audit has been conducted in conformity with the Auditing Standards issued by the Comptroller and Auditor General of India.

OVERVIEW

This Report contains significant audit findings which arose from the audit of the Public Sector Undertakings under the Ministry of Defence (MoD). It contains four chapters. Chapter I gives audited entity profile. Chapter II relates to observations arising out of Performance Audit. Chapter III relates to observations arising out of compliance audit of Public Sector Undertakings. Chapter IV relates to Follow up on Audit Reports.

Some of the important findings in the Report are given below:

Chapter II – Performance Audit on Construction and Delivery of Anti Submarine Warfare (ASW) Corvettes

MoD sanctioned ₹ 331.27 crore for augmentation of infrastructure facilities for construction of ASW Corvettes since as per the Cabinet Committee on Security (CCS) Note of March 2003, it was felt that the existing infrastructure was considered to be grossly inadequate. The modernisation was completed in 2013-14 as against the scheduled completion of July 2009 and thus, the work of modernisation of shipyard as well as construction of corvettes were undertaken simultaneously.

(Paragraph 2.1.2.1)

Audit observed that at the time of issue of Letter of Intent (LoI), only a sketchy specification of the ship was made available to Garden Reach Shipbuilders and Engineers Limited (GRSE) and finalisation of system design as well as specification of equipment, weapon and sensor fit were to be undertaken by Directorate of Naval Design (DND). DND finalised the same only in the year 2006 and major modifications continued till 2008. This resulted in delays in preparation of General Requirements for Acceptance of Quality (GRAQ). DND's failure to freeze the design before issue of LoI and commencement of construction concurrently without appropriate monitoring and target timelines resulted in delay in construction of the Corvettes.

(Paragraph 2.1.2.3)

The envisaged weight of the corvettes as per the contract (June 2012) was 3170 tonnes. During construction of first two corvettes (3017 and 3018), Integrated Headquarters (Navy) (IHQ(N)) observed that the weight of the Corvettes increased significantly due to adoption of various signature reduction measures. In order to achieve the reduction in weight of the Corvettes, DND suggested (May 2009) that GRSE use composite super structure in lieu of the steel super structure on board three Corvettes out of the four whereby the weight could be reduced by 70 to 80 tonnes. Considering

the long lead time for procurement of composite materials from foreign vendors, GRSE decided to use composite material only for the last two Corvettes. Audit contends that increase in the weights of Corvettes *vis-a-vis* the envisaged weight was owing to absence of a concrete plan for build of ships. A major change in construction plan/methodology in the middle of a major project involving construction of series of ships indicates inadequate preparation before sanction of project.

(Paragraph 2.1.2.5)

GRSE placed orders on the Integrated Headquarters (Navy) (IHQ (N)) nominated indigenous vendors for procurement of major equipment and systems. Audit observed that vendors did not adhere to the stipulated delivery dates and delivery schedule was extended up to 7 ½ years through amendments due to delay in development and manufacture, delay in sourcing/getting the raw materials, dependency on foreign vendors due to high import content, changes in components, list of deliverables etc. IHQ (N) had neither assessed the preparedness of the indigenous vendors including Central Public Sector Undertakings to take up development of systems before nominating them as single vendor nor developed alternate vendors for development of systems. As a consequence, supplies did not dovetail with the shipbuilding time lines as indicated in the CCS note.

(Paragraph 2.1.2.7)

GRSE completed the first ASW Corvette in 99 months and the second in 104 months. Though 105 months and 87 months were consumed in respect of the balance two ships upto December 2016, the percentage of completion was only 86 and 49 respectively. On a comparison of the activity-wise time consumed for construction of the remaining three corvettes with that of the first corvette, Audit observed that the time consumed was more than the first corvette. This was contrary to MoD prescribed benchmarks for performance parameters such as labour productivity, outsourcing, outfitting, procurement, etc. which assumed improvements over period from ship to ship and indicated that GRSE failed to derive the benefits of learning curve.

(Paragraph 2.1.3.2)

Against the 18 weapons and sensors to be installed on ASW Corvettes, Audit observed that the two ASW Corvettes delivered were not fitted with X weapon and sensor systems. Thus, ASW Corvettes could not perform to its full potential as envisaged.

(Paragraph 2.1.3.4)

Audit observed that Harbour Acceptance Trials (HATs) was still pending (December 2016) in respect of the second ASW Corvette (3018) for over a

year. Non-completion of HAT for this system resulted in not demonstrating the effective computation of ASW fire control solutions.

(Paragraph 2.1.3.5)

The Build Specification of ASW Corvette released in July 2003 specified a displacement of 2500 tonnes and achievement of maximum speed of 25 knots and cruising speed of 18 knots at ambient temperature of 40⁰C. GRSE clarified (November 2005) that it was not in a position to ensure stipulated weight as per Statement of Technical Requirements approved by the Navy. At the time of signing of the contract in June 2012, MoD increased the displacement to 3170 tonnes. Audit observed that the actual displacement of the first two Corvettes (3017 and 3018) delivered was 3384 and 3490 tonnes and the maximum speed achieved was 23.9 knots and 22.8 knots. The drop in the achievement of the specified speed was mainly on account of increase in weight of the ASW Corvette by over 800 tonnes from initial envisaged 2500 tonnes.

(Paragraph 2.1.4.2)

Sea Acceptance Test (SAT) is conducted to test vessel's speed, manoeuvrability, equipment and safety features. Audit observed that, SAT on six weapons and sensors and all weapons and sensors were pending satisfactory completion in respect of first Corvette and second Corvette respectively. Thus, the effectiveness of the main feature of the anti-submarine warfare was yet to be fully proved.

(Paragraph 2.1.4.3)

Chapter III – Transaction Audit Observations

Delay in delivery of aircraft to MoD due to delay in supply of technical documents, accessories & tooling by Original Equipment Manufacturer (OEM) and rectification of defective tools & jigs supplied resulted in delayed supply of Batch I aircraft. Not insisting for licence for manufacture of unlimited number of aircraft by MoD while negotiating for Batch I contract resulted in avoidable payment of licence fee for licenced manufacture of unlimited number of aircraft.

Hindustan Aeronautics Limited (HAL) also incurred expenditure of ₹ 107.05 crore on account of procurement of six additional engine kits in anticipation of order from MoD which remained infructuous. Though establishment of facilities for major servicing of airframe and engines was envisaged to be completed by March 2016 and March 2018 respectively, considering aircraft directly procured by MoD, HAL was yet to establish the facilities till date

(Paragraph 3.1)

Injudicious decision of Bharat Electronics Limited, to quote and enter into contract for establishment of Camp Area Network without considering the complexity of work involved and associated costs like Exchange Rate Variation, Warranty expenditure and impact of delay in supply, resulted in loss of ₹ 36.84 crore.

(Paragraph 3.2)

Bharat Electronics Limited (BEL) proceeded to develop three Dimensional (3D) L Band radar without clearly ascertaining the specific requirement of customer. Since customer was keen on S band 3D Aslesha radar modified for meeting the Bharani Mk II requirements, decision to go for development of L Band radar resulted in avoidable expenditure of ₹ 11.45 crore.

(Paragraph 3.3)

Improper estimation of cost and delay in submission of proposals for amendment of contract by Bharat Electronics Limited resulted in delayed execution of the project and loss of ₹ 56.43 crore including Liquidated Damages of ₹ 8.97 crore.

(Paragraph 3.4)

BEML Limited delayed commissioning of walking dragline and suffered consequent avoidable loss of ₹ 9.56 crore by way of Liquidated Damages.

(Paragraph 3.5)

Procurement of machine without ensuring required infrastructure resulted in idle investment of ₹ 13.15 crore. Further, the vision of BEML Limited to enter into aviation design, manufacturing and services remained unachieved.

(Paragraph 3.6)

Failure of Garden Reach Shipbuilders & Engineers Limited in taking up the proposal for modification as prescribed in the contract resulted in extra expenditure of ₹ 12.74 crore.

(Paragraph 3.7)

CHAPTER I

INTRODUCTION

1.1. About this Report

This Report of the Comptroller and Auditor General (C&AG) of India relates to matters arising from Compliance Audit of the financial transactions of the Public Sector Undertakings (PSUs) under the administrative control of Ministry of Defence (MoD), Government of India for the year ended 31 March 2016.

This Chapter provides profile of the PSUs along with planning and extent of audit. Chapter II relate to present findings/observations arising out of the performance audit of Construction and Delivery of Anti Submarine Warfare (ASW) Corvettes by Garden Reach Shipbuilders and Engineers Limited and Chapter III relate to individual findings/observations arising out of the compliance audit of PSUs under the Ministry.

1.2. Authority

C&AG conducts audit of Defence Public Sector Undertakings of Government of India under Section 19-A of the C&AG's (DPC) Act, 1971 and the relevant provisions of Indian Companies Act, 2013.

1.3. Planning and Conduct of Audit

Audit has been conducted in accordance with the principles and practices enunciated in the Auditing Standards and performance audit guidelines promulgated by the C&AG. The audit process starts with the assessment of risk of the PSUs. Based on this risk assessment, the frequency and extent of audit are decided.

1.4. Profile of the Audited Entities

There are nine PSUs and three subsidiaries functioning under the administrative control of Department of Defence Production, Ministry of Defence. Each PSU is headed by a Chairman and Managing Director.

Brief profile of the PSUs under the MoD are furnished below:

1. Hindustan Aeronautics Limited

Hindustan Aeronautics Limited (HAL) was incorporated in October 1964 under the administrative control of the Ministry of Defence (Department of Defence Production). The Company was conferred 'Navratna' status by the Government of India in 2007. The Company has five business groups/complexes viz. Bangalore Complex, MiG complex, Accessories Complex, Helicopter complex and Design Complex. Company is currently manufacturing Su-30 Mkl, Hawk, Dornier, Advanced Light Helicopter, Cheetal, Light Combat Aircraft - Tejas and related engines and accessories. The company is also providing Repair and Overhaul services for various Aircrafts and Helicopters including related engines and accessories. Company has a comprehensive Design and Development set-up and is engaged in the development of Intermediate Jet Trainer, Fifth Generation Fighter Aircraft, Multi Role Transport Aircraft, Light Combat Helicopter, Light Utility Helicopter, etc.

The Company has formed 12 joint ventures in the areas of software development, product support, design of avionics etc. with a total investment of ₹ 225.26 crore.

Authorised capital of the Company was ₹ 600.00 crore as at 31 March 2016. The paid up equity was ₹ 361.50 crore which was fully held by the Government of India. The Company's total revenue during the year 2015-16 was ₹ 18498.28 crore and it had earned a profit of ₹ 1653.77 crore.

2. Bharat Electronics Limited

Bharat Electronics Limited, Bangalore was incorporated in April 1954 as a fully owned Government of India Undertaking under the Ministry of Defence with the objective of designing, developing, manufacturing and supplying electronic equipment such as radars, communication equipment, naval systems, broadcasting equipment, telecommunication equipment, components etc., required by defence and civil customers. Government of India has conferred "Navratna" status to BEL on 22-6-2007. The Company has, at present, nine production units situated at Bangalore, Chennai, Hyderabad, Machilipatnam, Pune, Navi Mumbai, Ghaziabad, Kotdwara and Panchkula. The Company has one Joint Venture Company (JVC) viz. GE-BE Private Limited and two subsidiary companies viz. BEL Optronic Devices Limited and BEL-Thales Systems Limited.

Authorised capital of the Company was ₹ 250.00 crore as at 31 March 2016. The paid up equity was ₹ 240.00 crore of which ₹ 180.04 crore (75.02 per cent) was held by the Government of India. The Company's total revenue during the year 2015-16 was ₹ 7827.30 crore and it had earned a profit of ₹ 1357.67 crore.

2.1. BEL Optronics Limited (BEL-OP)

BEL Optronics Limited (BEL-OP), Pune is a fully held subsidiary of Bharat Electronics Limited (BEL), Bangalore. The Company was established for conducting research, development and manufacture of Image Intensifier Tubes for use in military, security and commercial systems.

Authorized Capital of the Company was ₹ 100.00 crore and the Paid up Capital was ₹ 37.83 crore. The Company's total revenue during the year 2015-16 was ₹ 121.51 crore and it had earned a profit of ₹ 2.43 crore.

2.2. BEL Thales Systems Limited

BEL Thales Systems (BTSL) was incorporated in India on 28 August 2014 as a Limited company under the Companies Act 2013. The company is a subsidiary of BEL. The Company obtained approval from Ministry of Company Affairs for commencement of its business on 21 November 2014. The primary focus of the company is to Design, Develop, Supply and Support of Defence and civilian Radars.

Authorized Capital of the Company was ₹ 80.00 crore and the Paid up Capital was ₹ 22.40 crore of which ₹ 16.58 crore was held by Bharat Electronics Limited. The Company was yet to start commercial operations and revenue during the year 2015-16 of ₹ 0.96 crore was from Interest on fixed deposits. The Company incurred a loss of ₹ 2.47 crore during the year 2015-16.

3. BEML Limited

Bharat Earth Movers Limited was incorporated in May 1964 as a Public Sector Undertaking for manufacture of Rail coaches, Mining Equipment and spare parts and was later renamed as BEML Limited (Company) in 2006. The Company has been conferred with 'Mini Ratna' Category-1 status since August 2006.

The Company has one subsidiary viz. Vignyan Industries Limited and two joint Ventures viz. M/s. BEML Midwest Limited and MAMC India Limited.

The Company has nine manufacturing units located at Bengaluru, Kolar Gold Fields (KGF), Mysuru and Palakkad. The Company manufactures variants of

Tatra vehicle for all terrain operations including Bridge Layer, Field Artillery Tractor, Medium & Heavy Recovery Vehicle, Pontoon Mainstream Bridge Systems, Crash Fire Tenders, Mobile Mast Vehicle, etc. The Company also supplies Engineering Mine Ploughs, Tank Transportation Trailers, Weapon Loading equipment, Armoured Recovery Vehicle, Milrail Coaches and Wagons apart from Aircraft Weapon Loading Trolley and Aircraft Towing Tractor.

Further the company offers a comprehensive and diverse range of mining machinery for both opencast and underground mines. It also supplies equipment to Indian Railways which include Integral Rail Coaches, Overhead Electric Inspection Cars, Postal Vans, AC/DC Electric Multiple Units, D-EMUs, Utility Track Vehicles, Track Laying Equipment, Broad-Gauge Railbus, Treasury Vans, Spoil Disposal Units etc. The company has forayed into high-tech Metro Trains deployed for intra-city commuting.

The Company launched its aerospace vertical during the year 2007 to exploit the potential of the e-engineering services in the aerospace domain and the Aerospace Manufacturing facility is established in Mysore Complex of the Company.

Authorised capital of the Company was ₹ 100.00 crore as at 31 March 2016. The paid up capital was ₹ 41.77 crore of which ₹ 22.50 crore (54.03 *per cent*) was held by the Government of India and rest 45.97 *per cent* was held by Public, Financial Institutions, Foreign Institutional Investors, Banks and employees. The Company's total revenue during the year 2015-16 was ₹ 3022.74 crore and it earned a profit of ₹ 52.65 crore.

3.1 Vignyan Industries Limited (VIL)

Vignyan Industries Limited at Tarikere, Chickmagalur District, was taken over by BEML Limited in 1984 and is functioning as a subsidiary Company. VIL is a Steel Casting Foundry supplying quality steel and alloy castings to various manufacturing units of BEML Limited.

Authorised capital of the Company was ₹ 4.00 crore as at 31 March 2016. The paid up capital was ₹ 2.79 crore of which ₹ 2.69 crore (96.56 *per cent*) was held by BEML Limited. The Company's total revenue during the year 2015-16 was ₹ 28.71 crore and it earned a profit of ₹ 0.45 crore.

4. Bharat Dynamics Limited

Bharat Dynamics Limited (BDL), established in July, 1970 is the prime agency for manufacture of Missiles in the country and is under the administrative control of Ministry of Defence.

The Company has its Registered Office at Kanchanbagh, Hyderabad and manufacturing units at Kanchanbagh, Bhanur (Medak District) and Vishakapatnam. The Company manufactures Anti-Tank Guided Missiles (Milan 2T, Konkur, Invar (3UBK 20)), Akash Missiles, Advanced Light Weight Torpedoes, Torpedo Counter Measure Systems, Counter Measure Dispensing Systems and Infra Red Interference Indicators.

Authorised capital of the Company was ₹ 125.00 crore as at 31 March 2016. The paid up capital was ₹ 97.75 crore which was fully held by the Government of India. The Company's total revenue during the year 2015-16 was ₹ 4344.40 crore and it earned a profit of ₹ 563.24 crore.

5. Mishra Dhatu Nigam Limited

Mishra Dhatu Nigam Limited (MIDHANI), established in November 1973, was set up to fulfill the need for Self-reliance in hi-tech special metals and alloys which had become essential for meaningful growth of Space, Atomic Energy, Aeronautical, Steel and Hydro-electric power & Defence sectors.

Company has a Registered Office and Manufacturing Unit at Kanchanbagh, Hyderabad, a Regional Office at New Delhi and two Commercial Offices at Kolkatta and Chennai.

Company has modern metallurgical facilities and high degree of technical competence in manufacturing a wide range of Super-alloys, Titanium, Special Purpose Steels and other special metals and alloys meeting stringent international standards for application in Aerospace, Defence, Atomic Energy, Power Generation, Chemical and other hi-tech industries.

Authorised capital of the Company was ₹ 200.00 crore as at 31 March 2016. The paid up capital was ₹ 187.34 crore which was fully held by the Government of India. The Company's total revenue during the year 2015-16 was ₹ 744.29 crore and it earned a profit of ₹ 118.03 crore.

6. Mazagon Dock Shipbuilders Limited

Mazagon Dock Shipbuilders Limited (MDL) (formerly known as Mazagon Dock Limited) established in 1934, is Country's one of the leading shipyard constructing warships as well as offshore platforms and functioning under the administrative control of Ministry of Defence, Govt. of India.

Company has its Corporate Office at Mazagon in Mumbai and a Regional office at New Delhi. Main activities of the Company are ship building, ship repairs and fabrication of offshore structures with facilities situated at Mumbai and Nhava. Company is capable of building warships, submarines, merchant ships upto 30,000 DWT and fabrication of well head platforms, process and production platforms and jack up rigs.

Authorised equity and preference share capital of the Company was ₹ 200.00 crore and ₹ 123.72 crore respectively as at 31 March 2016. The paid up share equity capital was ₹ 199.20 crore which was fully held by the Government of India. The Company's total revenue during the year 2015-16 was ₹ 4885.36 crore and it earned a profit of ₹ 637.82 crore.

7. Garden Reach Shipbuilders and Engineers Limited

The Company, established in 1884, was initially named Garden Reach Works in 1916 and after taken over by Government of India in April 1960 and diversifying into engineering products, the name was changed to Garden Reach Shipbuilders and Engineers Limited on 01 January 1977. Company is engaged in shipbuilding, ship repairs, Engine assembling and testing and engineering products.

Company has its Registered Head Office at Kolkata. It has six manufacturing units, five units in and around Kolkata, West Bengal and one unit in Ranchi, Jharkhand.

Authorised capital of the Company was ₹ 125.00 crore as at 31 March 2016. The paid up capital was ₹ 123.84 crore which was fully held by the Government of India. The Company's total revenue during the year 2015-16 was ₹ 1881.77 crore and it earned a profit of ₹ 160.72 crore.

8. Goa Shipyard Limited

Goa Shipyard Limited (GSL) established in 1957, is a leading ISO 9001-2008 certified shipyard on the West Coast of India, functioning under the administrative control of Ministry of Defence, Govt. of India.

The Company has its Registered Office at Vasco da Gama, Goa. The Company is engaged in ship construction/repairs, rendering general engineering services and supply of spares.

Authorised capital of the Company was ₹ 40.00 crore as at 31 March 2016. The paid up capital was ₹ 29.10 crore of which ₹ 14.87 crore (51.09 per cent) was held by the Government of India and ₹ 13.74 crore (47.21 per cent) was held by Mazagon Dock Shipbuilders Limited. The Company's total revenue during the year 2015-16 was ₹ 786.37 crore and it earned a profit of ₹ 61.89 crore.

9. Hindustan Shipyard Limited

Hindustan Shipyard Limited (HSL), established in January 1951, is engaged in ship building and ship repairing activities. The administrative control of the Company, which was earlier under the Ministry of Shipping was transferred to Ministry of Defence during February 2010.

The Company has its Registered Office and manufacturing unit at Gandhigram, Visakhapatnam.

Authorised capital of the Company was ₹ 304.00 crore as at 31 March 2016. The paid up capital was ₹ 301.99 crore which was fully held by the Government of India. The Company's total revenue during the year 2015-16 was ₹ 648.56 crore and it earned a profit of ₹ 19.00 crore. The Company has an accumulated loss of ₹ 1306.37 crore as at 31 March 2016.

1.5 Interest Income

Ministry of Defence (MoD) was the main customer for the DPSUs. An analysis of Other Income of six DPSUs disclosed that interest income constituted major source of revenue to these DPSUs which had also received huge advances from the customers. The details of Advances/Progress Payments received from Customers and outstanding as at 31 March, Interest Income, Profit after Tax and Percentage of Profit after Tax to Interest Income

during the last three years ending 31 March 2016 in respect of the six DPSUs is tabulated below:

Table 1.1

(Amount ₹ in crore)

Name of the DPSU	Particulars	2013-14	2014-15	2015-16
Hindustan Aeronautics Limited	Advances/Progress Payments received from Customers and outstanding as at 31 March	9191.83	8024.56	7501.42
	Term Deposits	16931.53	17200.65	12969.35
	Interest Income (from Term Deposits)	2065.35	1630.92	1548.57
	Profit after Tax	2692.52	2388.05	1653.77
	Percentage of Interest Income to Profit after Tax	76.71	68.30	93.64
Bharat Electronics Limited	Advances/Progress Payments received from Customers and outstanding as at 31 March	5272.68	4965.84	6311.37
	Term Deposits	1343.96	1601.11	2018.31
	Interest Income (from Term Deposits)	413.66	419.74	458.51
	Profit after Tax	931.62	1167.24	1357.67
	Percentage of Interest Income to Profit after Tax	44.40	35.96	33.77
Bharat Dynamics Limited	Advances/Progress Payments received from Customers and outstanding as at 31 March	5765.78	5487.39	5474.61
	Term Deposits	4151.00	3632.00	3247.12
	Interest Income (from Term Deposits)	411.85	384.98	301.16
	Profit after Tax	345.51	418.57	563.24
	Percentage of Interest Income to Profit after Tax	119.20	91.98	53.47
Mazagon Dock Shipbuilders Limited	Advances/Progress Payments received from Customers and outstanding as at 31 March	24419.21	27021.03	28767.78
	Term Deposits	5237.66	7589.55	8736.41
	Interest Income (from Term Deposits)	517.81	515.89	675.57
	Profit after Tax	397.61	491.59	637.82
	Percentage of Interest Income to Profit after Tax	130.23	104.94	105.92

Name of the DPSU	Particulars	2013-14	2014-15	2015-16
Garden Reach Shipbuilders and Engineers Limited	Advances/Progress Payments received from Customers and outstanding as at 31 March	4891.95	5536.74	5555.37
	Term Deposits	432.00	1965.00	2455.78
	Interest Income (from Term Deposits)	82.23	33.17	168.68
	Profit after Tax	121.46	43.45	160.72
	Percentage of Interest Income to Profit after Tax	67.70	76.34	104.95
Goa Shipyard Limited	Advances/Progress Payments received from Customers and outstanding as at 31 March	405.17	475.64	473.55
	Term Deposits	409.44	519.10	222.65
	Interest Income (from Term Deposits)	38.62	39.10	39.00
	Profit after Tax/Loss (-)	(-)61.09	78.24	61.89
	Percentage of Interest Income to Profit after Tax	-	49.97	63.02

It could be seen from the above Table that the six DPSUs received huge advances from MoD and Interest Income constituted major portion of the Profit after Tax during all the three years.

CHAPTER II

PERFORMANCE AUDITS

PERFORMANCE AUDIT ON CONSTRUCTION AND DELIVERY OF ANTI SUBMARINE WARFARE (ASW) CORVETTES



2.1.1. Introduction

A proposal was submitted (March 2003) by Ministry of Defence (MoD) to Cabinet Committee on Security (CCS) seeking approval for indigenous construction of four Anti-Submarine Warfare (ASW) Corvettes for the Indian Navy (IN). It was stated in the proposal that the Emergency Committee of the Cabinet had accepted (1964) a force level of X Cruisers/Destroyers/Frigates for the Indian Navy against which the force level was X ships. Of the X, three were to be decommissioned by 2006, two ships were under construction at Garden Reach Shipbuilders and Engineers Limited (GRSE) and three ships were being constructed in Russia. At the end of 2007, the force level would have been X. The proposal was to make good the likely depletion in the force levels of the warships.

The role of ASW Corvettes envisaged

- (a) Provide ASW capability to Carrier Battle Group (CBG);
- (b) Operate and control integral ASW helicopters;
- (c) Function as ASW Surveillance Control Platforms;

- (d) Provide ASW protection to merchantmen on main shipping routes approaching home ports; and
- (e) Search, locate and destroy submarines in designated areas.

The indigenous Weapons and Sensors fit included Hull Mounted Sonar (HUMSA), Active Towed Array Sonar (ATAS), Advanced Torpedo Defence System (ATDS), Under Water Telephone (UWT), Bathy Thermograph (XBT) and ASW Fire Control System. The ship would carry torpedoes, two rocket launchers, hello borne torpedoes and depth launchers. Corvettes were designed to incorporate stealth features to minimise underwater noise, Radar Cross Section and Infra-red emissions. The ship would also have one Advanced Light Helicopter (ALH) and telescopic stowage hanger for accommodating a Seaking Type helicopter.

The planned induction (of four ASW Corvettes during X Plan between 2002-03 and 2006-07 and XI Plan between 2007-08 and 2011-12) was to partially compensate the reduction in ASW capabilities due to decommissioning of three ASW frigates and ten ASW ships.

The estimated cost of construction of four Corvettes as per the CCS Note, was ₹ 2871.27 crore inclusive of Excise Duty and Foreign Exchange (FE) content of ₹ 564.52 crore. The delivery period of the first ship was approximately four years from the date of launch of construction. The construction for the subsequent ships could commence and delivery effected with a gap of 18 months. Thus, the construction was to start in 2004, 2005, 2007 and 2008 and ships were to be delivered in 2008, 2009, 2011 and 2012 respectively.

Government of India, Ministry of Defence conveyed (March 2003) to Integrated Headquarters (Navy) (IHQ (N)) sanction of the President of India for construction of four ASW Corvettes for the Indian Navy at a total project cost of ₹ 3051.27 crore¹ (2001-02 price level). MoD placed a Letter of Intent (LoI) on Garden Reach Shipbuilders and Engineers Limited (GRSE), Kolkata entrusting (March 2003) the construction and delivery of four Anti-Submarine Warfare (ASW) Corvettes. As per the LoI of IHQ (N), the ASW Corvettes were to be built to the design of Directorate of Naval Design (DND). GRSE was to procure material and services from the vendors nominated by IHQ (N). The ASW Corvettes were to be commissioned under the Eastern Naval Command, Vishakhapatnam.

¹Construction of the ships ₹2700.20 crore, Cost of B & D Spares ₹ 171.07 crore and cost of augmentation of yard facilities ₹180.00 crore.

Build Specification and General Arrangement (GA) drawings, the two basic documents for the ship, were to be prepared and issued by DND. DND finalised the Build Specification and GA drawings only in 2006 and GA drawings underwent major modifications till 2008. Based on the Build Specification and GA drawings finalised by DND, GRSE submitted (September 2008) a revised cost estimate of ₹ 10665.55 crore. After CNC meetings (October 2008 and January 2011) the cost was revised to ₹ 7852.39 crore. The increase in project cost was due to 242 *per cent* increase in cost of labour (from ₹ 472.68 crore to ₹ 1615.14 crore), 99 *per cent* increase in cost of materials (from ₹ 1822.00 crore to ₹ 3625.91 crore), 84 *per cent* increase in cost of Modernisation of facilities at GRSE (from ₹ 180.00 crore to ₹ 331.27 crore) and 454 *per cent* increase in cost of Base and Depot (B&D) spares (from ₹ 171.07 crore to ₹ 947.04 crore). GRSE attributed the increase to significant changes in equipment, weapon and sensor fit, indigenisation efforts for various equipments and substantial increase in yard effort due to final specification of the vessel being vastly different from the original concept. CCS sanction was accorded (April 2012) for the revised cost of ₹ 7852.39² crore. A contract was signed (June 2012) between MoD and GRSE for construction and delivery of four ships on a fixed price basis.

Audit scope and objectives

This Performance Audit is focussed on design, construction and delivery of four ASW Corvettes by GRSE during the period 2002-03 to 2015-16.

The project was taken up with the objective of inducting indigenous technologically advanced ASW Corvettes. The objectives of the Performance Audit were to examine:

- Whether GRSE was able to develop the capability to build advanced ASW Corvettes
- Whether the Indian Navy was able to induct technologically advanced Indigenous ASW Corvettes as per the induction plan;
- Whether the technical requirements of the Indian Navy were achieved and whether the intended benefits from the ASW Corvettes were realised.

² Construction of the ships ₹6574.07 crore, Cost of B & D Spares ₹ 947.04 crore and infrastructure development ₹ 331.27 crore.

Audit criteria

The criteria adopted for assessing the construction, delivery and performance of the ships are as follows:-

- CCS approvals
- Statement of Technical Requirements of Navy,
- Build Specification of Navy/Build strategy documents
- Contract with Navy and sub-contractors
- Defence procurement procedure/ manual and Indigenous shipbuilding procedure
- Ministry records and directives,
- GRSE Board sanctions and approvals; Internal orders and circulars
- Monthly progress reports submitted by GRSE to Indian Navy
- Minutes of Project Review Sub-committee and Apex Committee
- Program Evaluation Review Technique (PERT) and work plans for the ship construction
- Invoices of GRSE and paid bills

Previous Audit coverage

A Performance Audit on 'Indigenous construction of Indian Naval Warships' was conducted by the Comptroller and Auditor General of India and included in the Report No.32 of 2010-11. The report covered the observations for the period from 2005-06 to 2009-10 and covered projects sanctioned from 1986 to 2003. The observations on ASW Corvettes included delay in contract finalisation, selection of GRSE which had no prior expertise in such ship construction, delay in finalising labour hours, changes in hull design and equipment, release of funds before finalisation of contract, abnormal revision of contract costs. All the observations were prior to entering into contract. The report was discussed by the Public Accounts Committee (PAC) and observations/recommendations of the PAC on the Action Taken Note by the Ministry was included in the PAC's report No. 32 of 2015-16.

Audit methodology

Audit methodology adopted while conducting the audit included

- (i) holding of an entry conference on 26 May 2016 with the Management, representatives of Ministry of Defence (contract concluding authority) and Director General of Naval Design (nodal agency for the project),

- (ii) scrutiny of records of Naval Dockyard, Eastern Naval Command, Vishakhapatnam, DND, New Delhi and GRSE, Kolkata;
- (iii) information and contracts and their execution as also MIS reports;
- (iv) issue of preliminary audit observations for eliciting replies and clarifications.
- (v) Exit conferences were held with the Management of GRSE and DND on 9 December 2016 and 11 January 2017 respectively to discuss the audit findings and possible recommendations. The views of the Management and DND have been considered while finalising the report.

Audit Findings

2.1.2. Audit Objective 1: Whether GRSE was able to develop capability to build advanced ASW Corvettes

2.1.2.1. Non establishment of modernised infrastructure in time for construction of warship

As per contract entered (June 2012) into with MoD, ₹331.27 crore was sanctioned for augmentation of infrastructure facilities for construction of ASW Corvettes against ₹180.00 crore in March 2003. The yard was to be modernised for construction of corvettes since, as per the CCS Note of March 2003, existing infrastructure was considered to be grossly inadequate. The modernisation was completed in 2013-14 as against the scheduled completion of July 2009 and thus, the work of modernisation of shipyard as well as construction of corvettes were undertaken simultaneously.

2.1.2.2. Lack of proper planning

In terms of the LoI issued in March 2003, GRSE was to forward the proposed construction schedule, procurement schedule, forecast of funds requirement of schedule drawings and build strategy for taking up the project by April 2003.

Based on the experience of construction of other bigger ships, GRSE intimated (2003) build period ranging between 42 and 48 months. The contract could not be finalised immediately after the issue of LoI due to delay in finalisation of Build Specification and lack of clarity regarding the material to be used for construction. GRSE did not prepare/promulgate the PERT for the pre-launch activities of first two ASW Corvettes (3017 and 3018).

The cardinal dates for construction and actual date of delivery of all the four ASW Corvettes as per Controllerate of War Production & Acquisition Project Review Meetings (CPRM) and their achievement is detailed in **Annexure-I**.

It was observed that GRSE could adhere to the stipulated date at only “Start Production” stage. Subsequently, there was delay in achieving the major milestones which led to revisions of cardinal dates in the CPRMs.

Further, the PERT prepared by GRSE had no co-relation to the cardinal dates proposed in the CPRM which led to GRSE frequently updating the PERT chart.

Management agreed with audit observation and added that at the time of LoI only a sketchy specification of the ships was made available and finalisation of system design was yet to be undertaken by DND. Warship grade steel was also under indigenous development and production could start only after receipt of steel. Further there was also change in drawings/specifications based on requirement of customer which led to delays. Consequentially PERT had to be revised from time to time, which was inevitable.

2.1.2.3. Freezing of designs

The LoI of March 2003 indicated that the ASW Corvettes would be built to the design of DND. GRSE was required to furnish the schedule of drawings, specifications and build strategy to DND by April 2003. Upon this, the outline specifications, design drawings and other associated documents would be forwarded by DND to GRSE for construction of the ASW Corvettes within four weeks of their receipt.

Audit observed that at the time of issue of LoI, only a sketchy specification of the ship was made available to GRSE and finalisation of system design as well as specification of equipment, weapon and sensor fit were to be undertaken by DND. DND finalised the same only in the year 2006 and major modifications continued till 2008. This resulted in delays in preparation of General Requirements for Acceptance of Quality (GRAQ).

The table below summarises discipline-wise number of system drawings, approvals by DND, number of revisions and period thereof:

Table 2.1 – Details of number of revisions to System Drawings

Discipline	No. of major systems	Date of DND's approval to drawings	Period of revisions to drawings	Number of revisions in drawings (Minimum to Maximum)	Delay in no. of months from issue of LOI (March 2003)	Delay in no. of months from issue of LOI (March 2003) to last revision period
Hull and superstructure	85	July 2005 to March 2010	December 2005 to October 2013	1 to 10	28 to 84	33 to 127
Hull out fit	56	September 2005 to May 2015	April 2006 to June 2016	1 to 24	30 to 146	37 to 159
Machinery	31	February 2006 to August 2010	January 2007 to February 2013	1 to 13	35 to 89	46 to 119
Electrical and Weapon	75	June 2006 to July 2015	July 2006 to June 2016	1 to 16	39 to 148	40 to 159

Audit observed that the drawing as indicated in Annexure E of the contract was forwarded by DND to GRSE only between July 2005 and June 2016. Further, as could be seen from the Table supra, the approved designs were amended upto 24 times till as late as June 2016. The frequent amendments resulted in non-freezing of design of the major systems which adversely affected adherence to scheduled completion of Corvettes. As such, considerable time was spent for finalisation of design leading to delay in start as well poor progress of the project.

Thus, DND's failure to freeze the design before issue of LoI and commencement of construction concurrently without appropriate monitoring and target timelines resulted in delay in construction of the Corvettes.

2.1.2.4. Statement of Technical Requirement (SOTR)

SOTR for major equipment is prepared by the professional directorates of IN in consultation with the Productional Directorate of the Project i.e. DND. After preparation, SOTR is handed over to GRSE for passing the same on to vendors before signing of the contract for supplies. The dates of approval, amendments and time gap from LOI to latest amendments are detailed in **Annexure-II**. Audit observed that the time taken to finalise SOTR ranged

from 32 months to 68 months which affected the progress of ASW Corvette construction.

IHQ reply was silent in this regard.

2.1.2.5. Use of composite super structure in shipbuilding

The envisaged weight of the corvettes as per the contract (June 2012) was 3170 tonnes. During construction of first two corvettes (3017 and 3018), DND observed the weight of the Corvettes increased significantly due to adoption of various signature reduction measures. In order to achieve the reduction in weight of the Corvettes, DND suggested (May 2009) that GRSE use composite super structure in lieu of the steel super structure on board three Corvettes out of the four whereby the weight could be reduced by 70 to 80 tonnes. Considering the long lead time for procurement of composite materials from foreign vendors, GRSE decided to use composite material only for the last two Corvettes. After inviting tenders from three firms³ nominated (May 2009) by IHQ (N), the orders were placed on ThyssenKrupp Marine Systems International Pte Limited (TKMSI) in September 2010 for the composite superstructure material and associated works for two Corvettes i.e., 3019 and 3020 at a cost of ₹ 123.65 crore. This additional cost for the composite superstructure was catered to in the contract which was signed in June 2012.

Audit contends that increase in the weights of Corvettes *vis-à-vis* the envisaged weight was owing to absence of a concrete plan for build of ships. A major change in construction plan/methodology in the middle of a major project involving construction of series of ships spoke of inadequate preparation before sanction of project and resulted in non-commitment to sanctioned outlay with involvement of major escalation in construction cost. Further, the decision to go for composite super structure was taken as late as in May 2009 and placement of order in September 2010 with the lead time of 15 to 23 months had a cascading delay on the construction schedule.

Management replied (December 2016) that the use of advanced technology by way of carbon-composite super-structure was decided upon by the customer, considering various aspects including reduction of the overall weight of the ship and adoption of new technology in shipbuilding.

Reply is not convincing and indicated the faulty design specifications of the ships upfront.

³M/s Intermarine, Italy, M/s Kockums, Sweden and M/s Kangnam Corp, Korea

2.1.2.6. Nomination of single vendors

GRSE was to place order for various systems on IHQ(N) nominated vendors. The IHQ(N) nominates the vendor after going through procedure of solicitation, enquiry, technical evaluation and short listing. Subsequently, the DND intimates GRSE for initiating procurement action.

Audit observed that IHQ(N) nominated single source vendors in respect of 59 major machinery/equipment/ weapon and sensor systems. The value in respect of 132 purchase orders placed on such single source vendors amounted to ₹ 1992.61 crore which accounted for 57.70 *per cent* of total material cost of ₹ 3453.24 crore. Some of the major single vendors on whom GRSE placed purchase orders were BEL, L&T, BHEL, KOEL, GSF, Wartsilla and York, etc.,

IHQ(N) stated (October 2016) that the vendors for equipment were nominated by the Professional directorates. Identification of suitable vendors was a continuous process and the list was updated periodically based on capacity assessment of vendors.

Management stated (December 2016) that they had no option or little option, as the concerned material/equipment were either proprietary in nature or the manufacturer of the same has been nominated by the user/customer.

Reply of IHQ(N)/GRSE clearly indicates that the materials to be used and the source of procurement were yet to be decided at the time of placement of LoI. Further, the high percentage of single vendor would indicate the process of updation of vendors list needed to be improved in order to ensure availability of alternate vendors in case of failure/delay in supply by the single vendor.

2.1.2.7. Inordinate delay in supplies by indigenous vendors

GRSE placed orders on the IHQ(N) nominated indigenous vendors for procurement of major equipment and systems between 2005-06 and 2012-13 with staggered deliveries. On a review of 132 POs valued ₹1992.61 crore placed on single source vendors, Audit observed that vendors did not adhere to the stipulated delivery dates and delivery schedule was extended up to 7 ½ years through amendments (ranging from 2 to 13) as detailed in **Annexure-III**. The reasons attributed by the indigenous vendors were delay in development and manufacture, delay in sourcing/getting the raw materials, dependency on foreign vendors due to high import content, changes in components, list of deliverables etc.

IHQ(N) had neither assessed the preparedness of the indigenous vendors including Central Public Sector Undertakings to take up development of systems before nominating them as single vendor nor developed alternate vendors for development of systems. As a consequence, supplies did not dovetail with the shipbuilding time lines as indicated in the CCS note.

Management replied (December 2016) that it was taken as a developmental project with the objective of indigenisation of warship-building. As and when SOTRs were finalised, orders were placed by GRSE on the nominated vendors. Vendors took long time to develop the systems. However, considering the long term advantages of future production of these equipment in India, loss due to delays would be far outweighed by benefits derived.

Reply is not convincing as the single vendors on whom GRSE placed orders delayed the supplies. The delay had a significant impact on the Anti-submarine warfare capabilities of the Indian Navy. Though the ASW capability of the Indian Navy was severely depleted considering decommissioning of Petya class ASW Corvettes by 2003 and decommissioning of Leander/Nilgiri class Frigates with ASW capabilities by 2012, the first ASW Corvette was delivered only in July 2014 without major Defence and Offence capabilities.

2.1.2.8. Procurement of steel

IHQ(N) suggested (March 2004) for procurement of DMR 249A steel from Steel Authority of India Limited (SAIL) which was under development at Defence Metallurgical Research Laboratory, Hyderabad. In the CPRM (July 2004), IHQ(N) directed GRSE to go in for procurement of D40S for the first Corvette steel from M/s Rosoboronexport, Russia (ROE) till DMR 249A Steel from indigenous source was developed to avoid the delay in procurement of steel which was being produced for the first time by SAIL. While negotiations with ROE was underway, GRSE placed two purchase orders (August 2004) on SAIL for procurement of steel for the second and third Corvettes. SAIL developed (September 2004) steel based on the technical specification provided by DMRL. However, it could not adhere to the delivery schedule due to problems faced in rolling out and time extension was granted up to June 2008. As procurement from ROE also did not materialise due to high prices, the purchase orders for the requirement of steel for the balance two ships were also placed (June 2007) on SAIL. Thus, the delay in supply of steel from SAIL impacted the construction of the Corvette

IHQ(N) stated (October 2016) that construction of P-28 Ships was originally envisaged using D40S high tensile steel imported from Russia. Subsequently, at construction stage, a proposal for use of DMR 249A steel was approved and order on SAIL was placed in August 2004.

Management replied (December 2016) that indigenous production of DMR249A steel plates and sections by M/s SAIL and other private industries took a long time to stabilise. Also, availability of special electrodes (indigenous) for this steel took some time. GRSE prepared detailed procedure for qualification of welders and carried out welder's training for GRSE in-house welders as well as welders from subcontractors. Although this indigenisation process delayed the construction schedule of ASWC, it established the use of indigenously developed steel material for construction of naval ships which was a giant step towards indigenisation and self-reliance

The delay was crucial considering the Corvettes in operation in 2003 and decommissioning plan of the corvettes by 2007. The supply of indigenous DMR249A steel commenced only in 2008 and first Corvette was delivered only in July 2014 which severely limited the anti-submarine capabilities of the Indian Navy for seven years as the Navy was left with only limited Ships with Anti-submarine capability.

2.1.2.9. Procurement of Magazine Fire Fighting System (MFFS)

Magazine Fire Fighting System (MFFS) provides automatic switching of the firefighting systems in magazine spaces, gun barbettes and helicopter hangar spaces. GRSE invited (April 2009) global tenders for procurement of MFFS. However, IHQ(N) intimated (January 2010) that MFFS was to be procured from ROE since MFFS for majority of the indigenously designed and built warships were sourced from Russia through Inter Governmental Agreement. An order was placed (May 2011) on ROE for four sets of MFFS at a cost of ₹111.03 crore after a lapse of more than one year from the date of nomination of the vendor by IHQ(N). MFFS were received by GRSE after a delay of more than two years.

Management while agreeing with the audit observations replied (December 2016) that finalization of detailed specification from IHQ(N), conclusion of Tender Negotiation Committee (TNC) and final receipt of IHQ(N) directive to initiate procurement of MFFS took considerable time.

The reply confirms the audit observation that delay in placement of order of MFFS impacted the build schedule of the first ship.

Thus, delay in finalisation of materials required and also nomination of single vendors had an adverse impact on the availability of equipment for building of ASW Corvettes by GRSE.

Conclusion

DND did not finalise the Build Specification and freeze the design before issue of LoI and commencement of construction. IHQ(N) also failed to nominate the vendors in time and assess the preparedness of Indian vendors to take up indigenous development.

Recommendations

- *MoD may ensure that required infrastructure is established in time.*
- *A clear roadmap needs to be drawn for equipment under development stage till their final development so as to synchronise with completion of construction of warships.*
- *IHQ(N) needs to develop alternative vendors and update its vendor base to minimise the impact of delay in nomination and failure to supply by the nominated vendors.*
- *IHQ may also consider relying on the expertise of ship builder to identify vendors and make the builder accountable for timely delivery of ships.*

2.1.3. Audit Objective 2: Whether the Indian Navy was able to induct technologically advanced Indigenous ASW Corvettes as per the induction plan

2.1.3.1. Introduction

The four ASW Corvettes were to be built by GRSE according to the design of DND based on the outline specifications, design drawings and other associated documents. IHQ(N) was responsible for nomination of vendors, monitoring the development of weapons & sensor systems and promote indigenisation. While GRSE had constructed and delivered two ASW Corvettes - INS Kamorta (3017) in July 2014 and INS Kadmatt (3018) in November 2015 respectively to the Indian Navy (IN), the remaining two were under construction (January 2017).



Audit observed that ASW Corvettes delivered were not fully compliant with the anti-submarine capability as specified in the Contract. The factors which affected construction/capabilities of the ASW Corvettes were as below:

2.1.3.2. Delayed construction of ASW Corvettes

The time taken at various stages, ship-wise, is furnished below:

Table 2.2 – Details of Ship-wise Time taken

Sl. No	Activity	Percentage of work of total ship building activity	Time taken for completion (in months')		Time taken till December 2016 for completion (in months')	
			3017	3018	3019	3020
	Start Date		March 2006	March 2007	March 2008	September 2009
	Completion Date		June 2014	November 2015	In Progress	In Progress
	Percentage of Completion				85.96	48.96
1	Hull	22.5	63	60	102	87
2	Hull Out Fit (HOF)	17	81	95	78	60
3	Plumbing	13.5	81	95	87	72
4	Machinery	12	78	77	66	45
5	Electrical	12	69	71	60	42
6	Air Conditioning Ventilation and Refrigeration (ACVR) System	3.5	48	68	60	39
7	Weapon	6	48	56	45	18
8	Compartment out fitting	5	45	53	54	36
9	Services	8.5	54	65	45	24
	TOTAL	100	99	104	105	87

As could be seen from the above, GRSE completed the first ASW Corvette in 99 months and the second in 104 months. Though 105 months and 87 months were consumed in respect of the balance two ships upto December 2016, the percentage of completion was only 86 and 49 respectively.

On a comparison of the activity wise time consumed for construction of the second corvette (3018) with the first corvette (3017), Audit observed that the time consumed in respect of 3018 exceeded the time consumed by 3017 in six (items 2, 3, 5, 6, 7 and 8 of the Table above) out of the nine activities which ranged between 2 to 20 months. The time taken activity-wise in respect of the other two ships also were likely to exceed the time taken for the first ship. This was contrary to MoD prescribed benchmarks for performance parameters such as labour productivity, outsourcing, outfitting, procurement, etc. which assumed improvements over period from ship to ship. Thus, GRSE failed to derive the benefits of learning curve.

It is pertinent to mention that GRSE, in reply to MoD on comments of Ministry of Finance regarding revision of cost of the corvettes, stated (January 2012) that GRSE had adequate technical capability for construction and delivery of ASW class of ships. It further stated that based on the concept design, GRSE successfully developed system as well as detailed designs and it was the only defence shipyard having proven expertise of using DMR 249A steel.

2.1.3.3. Recovery of Liquidated Damages for Delayed Delivery of ASW Corvette

The first two corvettes were delivered during July 2014 and November 2015 as against the contracted delivery by October 2012 and July 2013. The construction of 3rd and 4th Corvettes was in progress though they should have been delivered in July 2014 and April 2015.

KAMORTA



KADMATT



Due to delay in delivery of first two corvettes, MoD withheld ₹ 103.25 crore (₹ 33.60 crore for 3017 and ₹ 69.65 crore for 3018) towards Liquidated Damages (LD). Further, as the contractual delivery dates had already expired for the balance two corvettes, GRSE was liable to pay ₹ 147.31 crore towards LD (₹ 72.89 crore towards 3019 and ₹ 74.42 crore towards 3020 at 5 per cent of ships basic cost) as per the terms of the contract.

Management, while agreeing (December 2016) with the audit observation, stated that delays were not wholly attributable to GRSE. After detailed analysis of the reasons for delays, the case for delivery date extension was taken up with customer. It was anticipated that the case for LD waiver (which was submitted to MoD with all justifications) would be viewed favourably. For the remaining two corvettes (i.e. 3019 and 3020) similar approach would be adopted.

Though GRSE submitted request for waiver of LD, MoD is yet to take a decision (January 2017). Due to delayed delivery, Indian Navy could not achieve induction of ASW Corvettes between 2002-03 and 2011-12 as envisaged

2.1.3.4. Non-installation of all the weapons and sensor systems.

Against the 18 weapons and sensors to be installed on ASW Corvettes, Audit observed that the two ASW Corvettes delivered were not fitted with X weapon and sensor systems viz. Equipment 'A' which included Equipment 'B' and Equipment 'C' to make the ASW Corvette perform to its full potential as envisaged. The issues are discussed below:

a. Equipment 'A':

Equipment 'A' provided detecting, locating, tracking and classifying all types of sub-surface targets like torpedoes, mines, submarines, etc. to the corvettes. Equipment 'B', which was a part of Equipment 'A', protected the corvette from torpedo attack by diverting the incoming torpedo towards the false target created by the Expendable Decoy Launcher. Equipment 'C' is a launcher employed to decoy the torpedo away from the ship.

As per the Statement of Requirements (SOR) formulated by GRSE, the Equipment 'A' was to detect

- dived conventional submarines and on motors up to a certain range in active detection range;
- dived conventional submarines and on motors up to a certain range in passive mode and

- torpedoes at certain range.

The induction of Equipment 'A' was planned (June 1998) under project Nagan which was to be designed and developed by Naval Physical and Oceanographic Laboratory (NPOL), Cochin with M/s Bharat Electronics Limited (BEL) as the production agency. The Research and Development (R&D) model productionised by BEL was installed on INS Sharada for conducting User Evaluation Trials (UET). However, the Equipment 'A' did not meet the requirement of Naval Staff Qualitative Requirements (NSQR). In view of this, the project Nagan was shelved in July 2010. In the meanwhile, IN conducted trials (2008) with L-3OS system which was successful. The trials conducted in 2010 and 2011 by BEL with L-3OS systems were successful. IN carried out trials with ATLAS system during 2011 and based on the trials, invited bids for Advanced Equipment 'A' (Equipment 'A'-ADV) in which ATLAS was L1 and BEL was L2. During the joint ship survey by BEL and ATLAS on the corvette during February and November 2014, it was found that the fitment of Equipment 'A' of ATLAS needed major structural modification to the ship. Considering the cost implication of ATLAS Equipment 'A'-ADV, BEL submitted (August 2015) its statement of case to IN for signing MoU with L-3OS. IHQ gave concurrence (November 2015) to go ahead with L-3OS and to process the case with Department of Defence Production (DDP). Case was under process with DDP (January 2017).

Development of Equipment 'B' was taken up by DRDO and as the user trials did not meet the NSQR, the same was not installed on the corvette.

Equipment 'C' was deleted from the scope of IAC MOD-C since it failed in user trials.

DND stated (January 2017) that MoU between BEL and ToT partner was required to ensure installation of the Equipment 'A' system and the same was awaited from BEL. It further stated that Equipment 'B' was envisaged to be integrated with Equipment 'A' and Equipment 'C' was part of Equipment 'B' which was under trials and hence, not supplied.

Thus, due to IN's failure to decide on suitable Equipment 'A' system despite successful completion of trials, Equipment 'A', Equipment 'B' and Equipment 'C' were not installed on the corvettes delivered and hence, the ability of ASW Corvettes for submarine and torpedo detection was hampered.

b. Equipment 'D'

Equipment 'D' is the corvette's self defence system against missile attack. Equipment 'D' provides double layered defence along with augmented

capability to defend against salvo attack (multiple missile attack). X Equipment 'D' were envisaged on board of each Corvette for accommodating certain Equipment 'D' missiles on board. Equipment 'D' was Buyer Furnished Equipment i.e., IHQ(N) had to supply this to GRSE as per the delivery required by GRSE. Procurement and installation of the system on board was not included in the shipbuilding contract. GRSE had to cater only for space for installation of Equipment 'D' missiles on board.

Equipment 'D' was to be developed by Defence Research and Development Organisation (DRDO), Hyderabad and manufactured by M/s Bharat Dynamics Limited. As DRDO could not develop Equipment 'D' in time, the fitment of Equipment 'D' was delinked from the project.

In accordance with IHQ(N) Memo of November 2006, Development systems and equipment were to be included for ships being designed by the Indian Navy and in case the development was not successful or did not comply with the time schedule indicated, alternate proven equipment was to be nominated to ensure procurement and integration within the shipbuilding time frame. Non fitment of the weapon systems was in violation of the IN's instructions.

DND stated (January 2017) that despite the best efforts, it was not possible to develop the Equipment 'D' and a draft Request for Indent (RFI) for progressing the case was formulated and forwarded for comments of external agencies. Further, certain close in weapon systems were fitted to provide the Corvettes with Point Defence against anti-ship missiles.

Due to non availability of Equipment 'D', ASW Corvettes did not have double layered defence along with augmented capability to defend against salvo attack.

2.1.3.5. Harbour Acceptance Trials (HATs)

Article 1.4 of the Contract envisaged that GRSE would carry out the Harbour Acceptance Trials (HATs)⁴ and Contractor Sea Trials (CST) before delivery of the vessel to Indian Navy in seaworthy state after first reading⁵ of Acceptance Document D-448⁶.

⁴HATs are conducted when the ship is stationery and includes Diesel Generator trials and Basin trials of the Ship.

⁵ First reading of the acceptance document is the date on which the D-448 liabilities are listed out. Second reading is done on the expiry of warranty period (1 year)

⁶ D-448 - The contract provided for conduct of successful Harbour Trials and Contractor's Sea Trials (CST) and delivery of the vessels to the buyer in seaworthy state after first reading of Acceptance Document D-448

Audit observed that HAT in respect of FCS IAC (MOD-C) was still pending (December 2016) in respect of the second ASW Corvette (3018) for over a year.

Management replied (December 2016) that HATs of FCS-IAC (MOD) with respect to Yard 3018 was not completed due to non-resolution of interface-issues. DND stated (January 2017) that generally HATs are largely completed before delivery. In case of certain equipment/systems where HATs prior delivery was not completed/prolonged due to various challenges particularly with reference to developmental systems, the same was included in D-448 liabilities.

Reply is not convincing as FCS IAC (MOD-C) was the integrated combat suite for computation of ASW Fire Control Solution and firing of all ship-borne ASW weapons. Non-completion of HAT for this system resulted in not demonstrating the effective computation of ASW fire control solutions.

2.1.3.6. D-448 liabilities

As per Article 7.4.2 Protocol of Delivery and Acceptance, the outstanding liabilities, if any, shall be exhaustively listed and annexed to the protocol of acceptance and delivery (Form D-448). D-448 liabilities were to be liquidated within 12 months of the delivery of the vessel. However, liabilities pending at the time of second reading of D-448 would be valued jointly by buyer and seller and the joint agreed cost deducted from final stage payment. The status of D-448 of the two delivered Corvettes as at the date of delivery and as on December 2016 is brought out in the table below:

Table 2.3 – Status of D-448 Liabilities

(in nos.)

Responsibility	INS Kamorta (3017)		INS Kadmatt (3018)	
	Status as of July 2014	Status as on December 2016	Status as of November 2015	Status as on December 2016
GRSE	8	2	8	3
Navy	3	2	2	2
Navy/GRSE	30	5	27	17
TOTAL	41	9	37	22

From the above table, it could be seen that even after more than two years of delivery of ASWC 3017 and one year after delivery (December 2016) of ASWC 3018, GRSE/Navy were yet to resolve liabilities.

The second reading of liabilities of 3017 (INS Kamorta) and 3018 (INS Kadmatt) should have taken place immediately after July 2015 and November 2016 i.e., on completion of the warranty period by which time all the liabilities should have been liquidated. However, even after a lapse of more than one year the second reading of liabilities was yet to take place (December 2016).

Management replied (December 2016) that efforts are on to liquidate all pending liabilities as mentioned in D-448.

Non-liquidation of the liabilities indicate that defects/concessions continued.

2.1.3.7. Guarantee Defects

Clause 1.4 of the Contract stipulated that GRSE would liquidate Guarantee Defects (GD), Guarantee dry docking and other outstanding liabilities listed in D-448. As per Article 16 of the Contract, the items supplied were under warranty and GRSE was responsible to rectify the defects in equipment or material for a period of twelve months from the time of taking over of the Corvette. Further, in cases which would require extension of warranty by OEMs on account of delay by GRSE, liability would be borne by GRSE. The table below brings out the GDs pending and resolved as at December 2016.

Table 2.4 –Guarantee Defects pending

(in nos)

Particulars	3017 (Kamorta)	3018 (Kadmatt)
Number of GDs	515	1223
Non-GD	57	240
GDs accepted by GRSE	458	983
GDs resolved by GRSE	435	572
GDs pending	23	411

Audit observed that the nos., of GD accepted by GRSE in comparison with the total GDs raised on both the Corvettes speaks of the sub optimal performance endurance of the equipment fitted on the Corvettes.

Conclusion

GRSE could not adhere to the time schedule prescribed in the contract for delivery of corvettes though it had stated that it was the only defence shipyard having proven expertise of using DMR 249A steel. The delay was on account of failure of indigenous vendors to adhere to scheduled timelines and change in material for superstructure. This led to withholding ₹ 103.25 crore towards liquidated damages by MoD. ASWC 3018 was delivered to the IN without successful completion of HATs on one of the weapons and sensor system. GRSE failed to liquidate D-448 liabilities within one year after delivery of

ASWC which resulted in failure to conduct second reading of the ASWC. Further, guarantee defects on the equipment/system indicated sub optimal performance endurance of the equipment fitted on the Corvettes and GRSE failed to liquidate the same.

Recommendations

- *GRSE needs to effectively monitor project activities from construction to delivery by dedicated Project Review Committees and through PERTs.*
- *Care needs to be taken to ensure installation of critical weapons/sensors as per envisaged time schedule.*
- *GRSE needs to synchronise all activities to adhere to the timelines fixed.*
- *GRSE needs to ensure that all D-448 liabilities and GDs are liquidated within the time stipulated in the contract.*

2.1.4. Audit Objective 3: Whether the technical requirements of the Indian Navy were achieved and the intended benefits from the ASW Corvettes realised.

2.1.4.1. Corvettes Fleet Level

MoD intended to overcome the depletion in the force level especially in the field of Anti-Submarine Warfare (ASW) considering the Nation's security environment and threat perception.

Considering that India did not possess Advanced Anti-Submarine Warfare Corvettes, MoD envisaged that about X ASW ships in each battle group were required. MoD placed an order for construction and delivery of four indigenous ASW Corvettes on GRSE which were to be delivered between 2008 and 2012. However, GRSE delivered only two Corvettes in July 2014 and November 2015. Further, even the ASW Corvettes delivered to the Indian Navy were not fully equipped with some of the major missiles systems and launchers, impacting the capability to effectively counter the underwater threat in the Indian Oceans.

Hence, the role of ASW Corvettes i.e. capacity to provide Anti-Submarine Warfare support to Carrier Battle Group; operate and control integral ASW helicopters, provide ASW Surveillance Control Platforms; provide ASW protection to merchantmen on main shipping routes approaching home ports and to search, locate and destroy submarines in designated areas could not be achieved.

DND stated (January 2017) that though the project was delayed for various reasons, Navy maintained adequate multi-purpose frigates, destroyers and coastal ASW Ships and ASW capable Aircraft to maintain the desired ASW readiness and capabilities.

Thus, the specific role of ASW Corvette i.e. providing a comprehensive platform consisting of Surveillance, advanced defence and offence capability could not be ensured to the Defence forces.

2.1.4.2. Increase in weight and decrease in speed levels

The Build Specification of ASW Corvette released in July 2003 specified a displacement of 2500 tonnes and achievement of maximum speed of 25 knots⁷ and cruising speed of 18 knots at ambient temperature of 40⁰C.

Further during the Controllerate Project Review Meeting (CPRM) held in September 2005, GRSE was informed to put an effective weight control mechanism in place so that the displacement does not exceed 2500 Tonnes. However, GRSE clarified (November 2005) that it was not in a position to ensure stipulated weight through design as the construction of the ASW Corvettes were as per the Navy approved SOTRs⁸. At the time of signing of the contract in June 2012, MoD increased the requirement of displacement to 3170 tonnes.

Audit observed that the actual displacement of the first two Corvettes (3017 and 3018) delivered was 3384 and 3490 tonnes which exceeded even the enhanced displacement by 214 and 329 tonnes respectively. Further, the maximum speed and cruising speed achieved was 23.9 knots on the first ASW Corvette (3017) and 22.8 knots on the second ASW Corvette (3018) respectively. The drop in the achievement of the specified speed was mainly on account of increase in weight of the ASW Corvette by over 800 tonnes from initial envisaged 2500 tonnes.

Management agreed (December 2016) that the reduction in speed was due to increase in displacement of the ship and stated that maximum speed attained was itself an achievement considering the increased weight of the ships. Management also stated that ASW Corvette was built as per the specifications, design and requirement of DND and first of its kind in the IN with the objective of indigenous development and construction of warship. During the course of construction additional items/requirements came in as per customer's requirement which resulted in increase in weight/displacement.

⁷ One knot = 1.15 miles per hour

⁸Statement of Technical Requirements

DND stated (January 2017) that during performance trials of the Main Propulsion System at full power, a speed of 24.7 knots (by GPS) and 23.9 knots (by log) was recorded which was very close to the design speed and was a result of efficient hydrodynamic design of the ship.

2.1.4.3. Delay in conducting Sea Acceptance Tests

Sea Acceptance Test (SAT) is conducted to test vessel's speed, manoeuvrability, equipment and safety features. SAT would be the joint responsibility of Navy and GRSE after delivery of the ship i.e., when the ship was on sail.

Audit observed that in respect of ASW Corvette 3017, SAT on FCS IAC (MOD-C), IRL, ITTL, AK 630, HUMSA NG and CMS started in March 2015 and were pending satisfactory completion. In respect of ASW Corvette 3018, SAT on all the weapons and sensors are pending satisfactory completion.

Thus, the effectiveness of the main feature of anti-submarine warfare was yet to be fully proved.

DND reply (January 2017) was silent on this issue.

Conclusion

The envisaged role of ASW Corvettes to provide Anti-Submarine Warfare support could not be achieved on account of non installation of critical sensors/ weapons as well as delays. The effectiveness of the main feature of anti-submarine warfare is yet to be fully proved as SATs in respect of six weapon sensor systems on the first corvettes and all the weapons and sensors in respect of the second corvette are pending satisfactory completion.

Recommendations

- *IN may ensure that adequate fleet level is maintained.*
- *IN may ensure that Designs are finalised in such a way that the envisaged parameters regarding weight and speed are achieved.*
- *Sea Acceptance Test needs to be conducted on priority to address defects in the system. Timelines should be fixed and effectively monitored for successful completion of SATs.*

The matter was reported to Ministry (October 2016); their replies were awaited (March 2017).

CHAPTER III

Transaction Audit Observations

Hindustan Aeronautics Limited

3.1. Licence Production and Supply of Hawk Mk 132 AJT aircraft by Hindustan Aeronautics Limited

3.1.1. Introduction

Government of India approved (October 1991) in principle the procurement of Advanced Jet Trainer (AJT) to train the pilots to fly advanced technology aircraft such as Sukhoi, Mirage, MiG 27 and Jaguar. HAL issued (February 1992) Request for Proposal (RFP) and Cabinet Committee on Political Affairs (CCPA) accorded (August 1993) approval for procurement of AJT. Based on the offers received, preliminary round of price negotiations were held with M/s British Aerospace (BAe) between December 1995 and February 1996 and M/s Dassault Aviation, France (DA) in February 1997. Since DA did not respond further, the price negotiations remained inconclusive. Fresh RFP was sent (June 1999) to M/s British Aerospace Systems (BAES) and DA by Air Headquarters to which BAES submitted (September 1999) their proposal while DA did not respond. A series of price negotiations were held with BAES and based on the negotiations, BAES submitted (March 2002) their final offer which was recommended to Government for approval. Cabinet Committee on Security (CCS) approved (September 2003) procurement of 24 BAe HAWK 115Y AJT Aircraft in flyaway condition and licence manufacture of 42 aircraft by Hindustan Aeronautics Limited (HAL).

The Memorandum of Understanding (MoU) between Government of India (GoI) and Government of Great Britain and Northern Ireland was signed on 19 March 2004 for supply of 24 Aircraft in flyaway condition and licence production of 42 Hawk aircraft, equipment and associated equipment and services by HAL. The contract (March 2004) for licence production of 42 aircraft included

- i. Licence Agreement with BAES for Transfer of Technology (ToT);

- ii. Purchase contract with BAES for supply of products, services and training in the United Kingdom and assembly of the Aircraft and Removable Role Equipment¹, including Gun Pods, etc.;
- iii. Contract for services to HAL; and
- iv. Licence Agreement for production of Adour Mk 871-07 engine with Rolls Royce Turbomeca (RRTM).

MoD entrusted the execution of all the above contracts for these 42 aircraft to HAL and all payments to the Original Equipment Manufacturers (OEM) were routed through HAL and accordingly MoD entered (February 2005) into a contract for supply of 42 Hawk Mk 132 aircraft with HAL at a value of ₹ 1982.21 crore (Batch I contract). The cost included ₹ 1777.01 crore being the HAL component of licence manufacture (including ₹ 290.67 crore towards Capital Expenditure², ₹ 305.03 crore towards Deferred Revenue Expenditure and

₹ 1181.31 crore towards other manufacturing cost at the rate of ₹ 28.13 crore per aircraft), ₹ 75.48 crore towards Customer Furnished Equipment (CFE) in respect of Direct Supply Aircraft and ₹ 129.72 crore for Supply of Spares and Test Equipment for detached operations, SACL items and supply, installation and commission of uninstalled engine test facility.

The above amount did not include ₹ 2581.37 crore being the amount paid by MoD as detailed below:

- ₹ 212.29 crore being the licence fee paid by MoD to BAES for Transfer of Technology to HAL;
- ₹ 2215.82 crore for Purchase contract with BAES for supply of products, services and training including Tooling and Test Equipment, for the manufacture and assembly of the Aircraft and Removable Role Equipment, including Gun Pods etc.;
- ₹ 92.02 crore for Contract for services (Technical Assistance in India for aircraft and engine as well as assistance in the modification of the Engine Test Facility (ETF) at HAL) to be rendered by BAES to HAL; and
- ₹ 61.24 crore being the licence fee paid by MoD to Rolls Royce for Transfer of Technology to HAL.

¹Removable Role Equipment means items of equipment which are carried on some flights, but not included in Empty weight and are not mandatory for the type of operation being conducted.

²₹ 41.00 crore towards Civil Works and ₹ 249.67 crore towards Plant & Machinery

Thus, the total cost for 42 aircraft worked out to ₹ 4563.58 crore (₹ 108.66 crore per aircraft). The aircraft were to be delivered by HAL between 2007-08 and 2010-11. Against this, HAL delivered the aircraft between 2007-08 and 2012-13 i.e. with a delay ranging from 5 to 24 months.

The Licence manufacture at HAL of 42 aircraft was taken up in three phases as detailed below:

Table 3.1 –Phases of Aircraft Manufacture

Phase	No of Aircraft	HAL participation
I	3 (SKD) ³	Installation of flaps, ailerons, wing tip fairings, manufacture of details parts and assemblies of defined assemblies (empennage, flaps, ailerons, airbrakes, engine bay doors and under carriage doors), fabrication of details parts and assemblies of Removable Role Equipment, installation of accessories in fin, coupled fuselage and final assembly, installation of equipment in fuselage, fabrication of detail parts and assemblies of Gun Pod, installation of wing and engine and final assembly activities, system checks (fuel, hydraulics, flight control, air pressurization etc.), Engine Ground Run (EGR), Flight Test and Acceptance (FAT) and delivery.
II	3 (CKD) ⁴	Assembly of fuselage structure, wing structure, installation of flaps, ailerons, wing tip fairings, manufacture of details for canopy and wind screen, detail parts and assemblies for equipping, installation of equipment in Fin, wing, equipping and final assembly, manufacture of detail parts and assemblies of Defined assemblies (empennage, flaps, ailerons, airbrakes, engine bay doors and under carriage doors) and installation, manufacture of details parts and assemblies for Removable Role Equipment, detail parts and assemblies of Gun Pod, manufacture of detail parts and assemblies for installation in final assembly, system checks (fuel, hydraulics, flight control, air pressurization etc.), Engine Ground Run (EGR), Flight Test and Acceptance (FAT) and delivery
III	36 (Raw material)	Fabrication of detailed parts and assemblies for Airframe and installation kits, installation of accessories in fuselage and engine, fabrication of details parts and assemblies of gun pod and continuation of Phase I and II activities

While the Batch I was under execution, MoD entered (July 2010) into two contracts with HAL (Batch II contracts) for supply of 57 Hawk aircraft as detailed below:

³ SKD: Semi Knocked Down Kit

⁴ CKD: Completely Knocked Down Kit

- 40 for Indian Air force at a cost of ₹ 6459.89 crore. The cost included ₹ 3920.00 crore for 40 aircraft (at the rate of ₹ 98.00 crore per aircraft), ₹ 12.40 crore towards Technical Publications, ₹ 332.80 crore for ten reserve engines, ₹ 105.32 crore for four engine modules, ₹ 1788.67 crore towards Spares and Services, ₹ 238.31 crore towards Licence Fee payable to BAES and ₹ 62.39 crore towards Royalty payable to RRTM. The aircraft were to be delivered between 2013-14 and 2016-17.
- 17 for Indian Navy at a cost of ₹ 3042.79 crore. The cost included ₹ 1666.00 crore for 17 aircraft (at the rate of ₹ 98.00 crore per aircraft), ₹ 5.27 crore towards Technical Publications, ₹ 166.40 crore for five reserve engines, ₹ 52.66 crore for two engine modules, ₹ 1017.92 crore towards Spares and Services, ₹ 2.06 crore towards Training on Engine, ₹ 101.28 crore towards Licence Fee payable to BAES and ₹ 31.20 crore towards Royalty payable to RRTM. The aircraft were to be delivered between 2013-14 and 2016-17.

HAL completed the delivery of the 57 aircraft in July 2016.

Consequent to the above contracts signed with Air Force and Navy, HAL entered (August 2010) into contracts with BAES for aircraft manufacture and with RRTM for engines for Batch II contract.

It was seen that HAL had supplied 42 Hawk aircraft of Batch I contract with delay ranging from 5 months to 24 months as detailed below:

Table 3.2 – Details of Delivery of Batch I Aircraft

Phase	No. to be supplied	Scheduled Delivery	Actual Delivery	Delay (in months)
Batch I				
I	01	March 2008	August 2008	5
	02	June 2008	March 2009	9
II	01	June 2008	June 2009	12
	02	September 2008	August 2009 October 2009	11 13
III	01	September 2008	February 2010	17
	03	December 2008	March 2010	15
	02	March 2009	March 2010	12
	03		September 2010	18
	04	June 2009	December 2010	18

Phase	No. to be supplied	Scheduled Delivery	Actual Delivery	Delay (in months)
	02		March 2011	21
	06	September 2009	March 2011	18
	01	December 2009	May 2011	17
	02		August 2011	20
	02		November 2011	23
	01		December 2011	24
	01		March 2010	January 2012
	02	February 2012		23
	03	March 2012		24
	02	June 2010	March 2012	21
	01		May 2012	23

The delay was attributed by HAL to delay in supply of technical documents, accessories & tooling by OEM and rectification of defective tools & jigs supplied.

All the 57 aircraft of Batch II were supplied between 2012-13 and 2016-17 without any delay.

During the review of licence manufacture in the two batches of aircraft by HAL, the following were noticed:

3.1.2. Inadequacies in Supplies

3.1.2.1. Non-commissioning of Mission Planning Debriefing System

Mission Planning Debriefing System (MPDS) is a debriefing tool for synthetic⁵ as well as actual sorties. HAL supplied nine MPDS to IAF between April 2014 and February 2015 for the Batch II contract with 3 sets of software CDs. However, no associated manual/operating instructions were supplied and hence, the software could not be loaded on the systems. Due to non-availability of the system, there was no recording of the synthetic/actual flying sortie sessions of the rookie pilots. Thus, the trainees/instructors were deprived of the debriefing sessions which would enable the trainees to overcome the deficiencies/mistakes during the sorties. Audit also observed that there were compatibility issues between Batch I and Batch II MPDS.

Management stated (November 2016) that IAF formally accepted the MPDS in March 2016 based on the usage of the equipment though the commissioning was completed in April 2015. It further stated that to avoid use of different

⁵ Synthetic is a simulation system

standard of MPDS by IAF, HAL submitted (September 2016) a proposal for Free of Charge replacement of Batch I MPDS with Batch II MPDS as suggested by BAES and IAF response was awaited.

The reply confirms the fact that there were issues in the MPDS supplied and thus, IAF was deprived of the benefits accruing from the system.

3.1.2.2. *Inability to record data relating to flying sorties due to VCR Loom cable fault*

Batch I of Hawk aircraft was fitted with Video Monitoring and Recording System (VMRS) for the purpose of debriefing the trainee pilots by their instructors. Breakage/discontinuity of VCR loom cable was noticed in six Aircraft due to stretching resulting in non-recording of the flying sorties for the purpose of debriefing of the trainee pilots by their instructors. BAES proposed (May 2013) a modification to introduce a sacrificial cable to reinstate the lost loom length which was to be carried out by HAL at their cost. Finally a Replacement Plan was proposed (October 2013) for upgradation of Batch I aircraft with Digital Monitoring and Recording System (DVMRS) system similar to Batch II.

Management stated (November 2016) that the design related issues were resolved by BAES as BAES had confirmed in August 2016 for submission of proposal to IAF for supply of DVMRS for Batch I contract.

The reply indicates that the issue was yet to be resolved as upgradation of DVMRS in Batch I aircraft was yet to be completed.

3.1.2.3. *Fitment of Cat 'B' Line Replaceable Units (LRUs) on aircraft*

IAF requested (May 2009) HAL for diversion of Line Replaceable Units⁶ (LRUs) in order to maintain serviceability of 24 Aircraft supplied directly by BAES. HAL diverted partial LRUs from additional five aircraft sets of 42 Hawk programme. Since IAF did not return Cat 'A' LRUs loaned by HAL, IAF agreed for fitment of Cat 'B' LRUs to deliver the last batch of production Aircraft. IAF also loaned (March 2012) three Aircraft to HAL for facilitating the fitment of Cat 'B' LRUs. HAL cannibalized the aircraft parts for meeting the production schedule of 2012-13. Audit observed that these three loaned Aircraft were signalled out in 2011-12 and hence, the loaned Aircraft were to be rebuilt as per the Standard Operating Procedure (SOP) and the rigors of

⁶A line-replaceable unit (LRU), lower line-replaceable unit (LLRU), line-replaceable component (LRC), or line-replaceable item (LRI) is a modular component of an airplane, ship or spacecraft (or any other manufactured device) that is designed to be replaced quickly at an operating location

signalling out procedures had to be followed to return the loaned aircraft to IAF.

Five aircraft were signalled out (March 2013) by HAL to IAF for which Cat 'B' items were fitted. IAF specified to HAL that the aircraft invoice should exclude the cost of Cat 'B' LRUs and HAL could claim the same after replacement with Cat 'A' LRUs. Audit observed that Principal Controller of Defence Accounts (Paying Authority) withheld the balance five *per cent* payment of five aircraft amounting to ₹ 16.90 crore pending receipt of clarification from Air Head Quarters (AHQ).

Management while concurring (December 2015) with the audit observation stated that the matter was being pursued with AHQ.

The fact remains that due to non-returning of Cat 'A' LRUs by IAF, the funds of HAL were blocked with IAF due to delivery of five aircraft with Cat 'B' LRUs instead of Cat 'A' which had been done on the specific request of IAF itself.

3.1.2.4. Malfunctioning of High Pressure Fuel Pump

Malfunctioning of high pressure fuel pump (June 2015) caused force landing of one Hawk aircraft. Investigations (August 2015) by RRTM revealed that the rubber diaphragm was split and the manufacturing defect could affect a number of new, overhauled (reconditioned) and repaired HP Fuel Pumps. Based on the investigations by BAES, RRTM issued a Non-Mod Service Bulletin (NMSB) instructing recall of all HP Pumps in the affected population before the next flight, if it had not completed 100 hours of exploitation. Out of 62 HP Fuel Pumps recalled by OEM, 60 Pumps were received by HAL and 52 were fitted on the engines. Thus there has been a non-compliance of the NMSB.

Management has not offered any remarks to the Audit observation.

3.1.3. Delay in establishment of facilities for Testing, Repair and Overhaul of Aircraft and Engines

As a part of the contracts entered (March 2004) into with BAES, HAL was given exclusive rights to repair and overhaul of Hawk aircraft. The Total Technical Life (TTL) of the Hawk Mk 132 aircraft was 6000 hours and the aircraft was required to undergo major servicing after completion of 2000 flying hours/10 years whichever was earlier. Though the facilities were set up, there were delays in setting up the facilities which have been discussed in the succeeding paragraphs.

Table 3.3 – Details of Establishment of Repair and Overhaul Facilities

Sl. No.	Facility	Scheduled completion by	Actual completion
1	Repair and Overhaul (ROH) facilities for airframe LRUs	December 2012	March 2016
2	Establishment of facilities for major servicing of airframe	March 2016	Completed.
3	Establishment of facilities for engine overhaul	March 2018 (24 months from the date of sanction i.e. March 2016)	--

3.1.3.1. Delay in handing over of site for construction

The DPR for the licence build of Hawk aircraft envisaged that construction of Hangars and civil works for Hawk production would be ready by June 2006. HAL placed the work order for civil works (Construction of Apron, Roads, Drains and Compound wall) in June 2006 with scheduled completion by September 2007. However, HAL handed over the complete possession of site to the contractor only in February 2008 after a delay of 20 months. Delay in handing over of site led to payment of ₹ 3.50 crore to the contractor towards cost of escalation.

Management concurred with audit observation.

Thus, due to delay in handing over the site, the Company had to make extra payment of ₹ 3.50 crore to the contractor towards cost of escalation.

3.1.3.2. Non-utilisation of Machines procured

HAL placed (January 2006) order for one Bridge Cut Fixed Table Machine on M/s Le Creneau Industriel, France at a cost of Euro 8.05 lakh (₹ 4.42 crore) for routing the sheet metal components of Hawk aircraft. The machine was received in June 2007 but installed in the existing hangar during September 2007 as the new hangar was not ready. Further, HAL outsourced machining jobs of sheet metal components during 2007-09 by incurring an expenditure of ₹ 12.80 crore though the procured machine was installed.

HAL placed (December 2005) order for FET 600T Stretch Forming Press Machine on M/s ACB, France at a cost of Euro 22.80 lakh (₹ 13.00 crore) for machining various components of Hawk aircraft. The machine received in January 2007 was installed only in June 2007 in Aircraft Division as the building for the establishment of production facilities was not ready.

Management concurred with audit observation.

Thus, the basic purpose of procurement of machine was not achieved.

3.1.3.3. *Delay in establishment of Testing and Repair Overhaul facilities for airframe LRUs at HAL*

Technical Project Report submitted (August 2000) by HAL and BAES as well as the Licence Agreement, Purchase and Service Contracts entered into with MoD envisaged establishment of Repair and Overhaul (ROH) facilities for Accessories at HAL. Out of 320 LRUs provided by BAES, 75 LRUs were non-repairable, Original Equipment Manufacturer (OEM) did not offer ToT for 5 LRUs, ToT for 5 LRUs were not considered viable and it was planned to establish ROH for 235 LRUs. GoI sanctioned (December 2009) ₹ 530.05 crore for establishment of facilities of which ₹ 521.62 crore was to be funded by MoD and balance ₹ 8.43 crore was to be funded by HAL. The facilities, which were to be established by December 2012, were established only by March 2016. HAL proposed (November 2012/June 2013) establishment of facilities for 9 additional LRUs (cost ₹ 32.47 crore) without any additional financial implications and also requested AHQ for extension of time up to November 2015. The proposal was yet (November 2016) to be approved by CCS. Due to failure to complete the facilities on time, MoD released only ₹ 186.32 crore out of ₹ 456.04 crore incurred by HAL up to June 2016.

It is pertinent to mention that 706 items of LRUs supplied by BAES during the period from December 2005 to September 2007 were rendered unserviceable during different stages of production. Of these, warranty of 348 items had expired and ten items were Beyond Economic Repair (BER). The defective items were sent to BAES for service and repair. HAL incurred ₹ 41.41 crore towards servicing, repair and return of warranty expired LRUs during the years 2010-11 and 2011-12. HAL also procured 323 LRUs rendered unserviceable at a cost of ₹ 75.47 crore. Delay in establishment of Testing and Repair & Overhaul facilities for LRUs resulted in the LRUs being sent to BAES and additional expenditure of ₹ 116.88 crore

Management attributed (November 2016) the delays to unanticipated technical and contractual issues encountered during signing/execution of contract, signing of the Integrity Pact by OEMs, delayed supplies from OEMs, Procedural delays in obtaining export licences by OEMs and stated that the same were beyond the control of HAL.

Due to delay in establishment of facilities, ROH of the first two aircraft inducted were undertaken in the existing facilities of overhaul division with technical assistance from BAES besides blocking of HAL's funds.

3.1.4. Other Issues

3.1.4.1. Avoidable payment of Licence fee to BAES/HAL for additional 57 Hawk Aircraft

MoD paid BAES ₹ 212.29 crore (GBP 26.00 million) towards Licence Fee for Transfer of Technology for manufacture of 42 aircraft in accordance with Licence Agreement (March 2004). The purchase and licence agreement signed (August 2010) with BAES for manufacture of 57 aircraft stipulated payment of licence fee of GBP 37.80 million for exclusive right to manufacture and supply an unlimited number of aircraft, Removable Role Equipment and gun pods.

Contract Negotiation Committee (CNC) stated (January 2009) that the payment of licence fee again was not justified as licence fee was normally paid once although it was recognised that there was a specific limitation of numbers in the earlier contract. Based on CNC observations, the vendor agreed for the waiver of royalty but retained the licence fee.

BAES stated (September 2009) that they requested HAL to advise the number of aircraft so that they could quote the revised Licence Fee and since no response was received from HAL, the Licence Agreement made it clear that it was only for 42 aircraft.

It is pertinent to mention that Clause 4.5 of the Licence Agreement entered into by GoI with Rolls Royce Turbomeca Limited (RRTM) for production of Adour Mk 871-07 engine for the Hawk aircraft envisaged an amount of GBP 7.50 million towards licence fee for grant of licence to HAL for manufacture of engines to the extent GoI entrusts work to HAL. However, a similar clause was not included in the agreement with BAES resulting in payment of Licence Fee by HAL even for the additional contract.

Thus, failure to obtain manufacturing rights for unlimited number of aircraft, Removable Role Equipment and gun pods at the first instance resulted in payment of licence fee GBP 37.80 million (₹ 362.03 crore) for production of unlimited aircraft.

Management stated (November 2016) that Licence Fee paid to BAES through the contract dated 26 March 2004 was for production of only 42 aircraft and the contract was entrusted to HAL for implementation only.

The reply is not convincing since MoD failed to protect its interests as evident from contrary clauses in the two agreements entered with BAES and RRTM.

3.1.4.2. Procurement of additional engine kits without any firm order – ₹107.05 crore

HAL Board approved (February 2012) procurement of six additional engine kits comprising of raw materials, finished parts, consumables and accessories from RRTM at a value of ₹ 107.05 crore against production of engines in anticipation of order and accordingly Purchase Order was placed (March 2012) on RRTM under the Future support clause of Batch II contract in anticipation of order from MoD. These engine kits were received between October 2013 and January 2014 and have been lying in stores since then. As the order was yet to be received from MoD (January 2017), procurement of additional engine kits resulted in idle inventory and consequent blocking of ₹ 107.05 crore.

Management stated (November 2016) that additional six engine kits were procured to get price advantage by operating the price clause, it was a business decision to buy in anticipation of orders and the same would be utilized for future orders and benefits of escalation and ERV would compensate the inventory carrying cost.

The reply of the Management confirms the audit observation that the procurement was made without any firm order/Letter of Intent. Anticipated order was yet to materialize and thus, procurement resulted in blocking of funds of ₹ 107.05 crore for more than three years besides consequential loss of interest thereon.

Conclusion

Delay in delivery of aircraft to MoD due to delay in supply of technical documents, accessories & tooling by OEM and rectification of defective tools & jigs supplied resulted in delayed supply of Batch I aircraft. Not insisting for licence for manufacture of unlimited number of aircraft by MoD while negotiating for Batch I contract resulted in avoidable payment of licence fee for licenced manufacture of unlimited number of aircraft.

HAL also incurred expenditure of ₹ 107.05 crore on account of procurement of six additional engine kits in anticipation of order from MoD which remained infructuous. Though establishment of facilities for major servicing of airframe and engines was envisaged to be completed by March 2016 and March 2018 respectively, considering aircraft directly procured by MoD, HAL was yet to establish the facilities till date.

Recommendations

- *HAL may ensure that the supplies are effected completely so that the customer obtains the envisaged benefits from the product.*

- *HAL may procure required materials only on confirmed orders to avoid holding of idle inventory.*
- *HAL may prioritise establishment of facilities for repair and overhaul to ensure on time after sale service to the customers.*
- *MoD should ensure that licence fee for Transfer of Technology is obtained for unlimited number so as to avoid payment of the same in case of requirement of additional numbers in future.*

The matter was reported to Ministry (November 2016); their replies were awaited (March 2017).

Bharat Electronics Limited

3.2. Injudicious decision of the company resulted in loss of ₹ 36.84 crore

Injudicious decision of Bharat Electronics Limited, to quote and enter into contract for establishment of Camp Area Network without considering the complexity of work involved and associated costs like Exchange Rate Variation, Warranty expenditure and impact of delay in supply, resulted in loss of ₹ 36.84 crore

Indian Air Force (IAF) invited (March-April 2007) Expression of Interest (EoI) for “Establishment of Camp Area Network of IAF” (AIRCAN). The major components of the Network were Servers, Storage Devices, Computers, Wi-Max Radios, Video Conferencing Equipment, Kiosks, Software of Microsoft & Red Hat Linux and Oracle Database. As per the EoI,

- The estimated project value was around ₹ 100 crore;
- Authorization letter of only one Original Equipment Manufacturer (OEM) per component was required to be enclosed with the EoI;
- The payment terms were 50 *per cent* of total cost of contract after delivery of all deliverables, inspection and acceptance of all items at 49 bases, 40 *per cent* of total cost of contract after successful completion of installation, integration, training and handing over of the complete system and balance 10 *per cent* of total cost of contract on receipt of warranty bond valid for 39 months from the date of handing over of the complete system;
- Three years on-site warranty and Product Support Commitment for five years after warranty;

- Liquidated Damages (LD) at 0.5 *per cent* of the value of delayed items per week or part thereof subject to maximum of five *per cent* of the value of delayed stores.

Bharat Electronics Limited (BEL) submitted the authorization from IBM (Servers and Storage Devices), Acer (Desktop Computers), Maksat (Wi-Max Radios), Polycom (Video Conferencing Equipment), Tyco (Kiosks), Delta (Uninterrupted Power Supply (UPS)) and EPSON (Printers).

EoI was followed (September 2007) by Request for technical and commercial Proposal (RFP). Since it was a competitive bid (competition from M/s HCL Info Systems, M/s Wipro, M/s ITI, M/s CMC, M/s HP, etc.) and also considering the customer's budget, the Company decided (January 2008) to quote sub ₹ 100 crore. The Company also decided not to consider

- Foreign Exchange (FE) variation, since the dollar and the prices of IT products was having a declining trend and the reduction in prices of IT products were higher than the likely rise in dollar rate;
- LD, since Air Force would take atleast two to three months from the opening of the Commercial Bid to Contract Signing and this time would be utilised for advance action of procurement so that LD was not imposed;
- Additional Warranty Support cost, since back to back warranty support was asked from all vendors.

The Company's offer was accepted and the contract for supply, Installation and Commissioning (I&C) of hardware, software and Networking equipment at 49 bases for Camp Area Networking was awarded (March 2010) to BEL at a price of ₹ 99.49 crore with a delivery schedule of 32 weeks i.e., November 2010. BEL completed the contract by March 2013 after a delay of more than two years.

The following observations are made:

- (i) The items to be imported included Ruggedized Fiber (Optical Fiber Cable) which was to be imported from Switzerland. Though the item was to be imported from Switzerland, the Company did not consider the impact of variation of Swiss Franc while deciding not to consider the exchange rate in the quotation. Further, while the contract for supply of the items was signed with IAF in March 2010, Purchase Order (PO) for this item was placed only in April 2011 and item was received between March 2012 and June 2012. As against ₹ 15.29 crore considered in the quotation submitted to IAF based on the Swiss Franc exchange rate of ₹ 34.32, the total amount paid was ₹ 23.28 crore. As against the exchange rate of ₹ 34.32 considered in

the quotation, the actual exchange rate varied from ₹ 54.70 to ₹ 58.50. Failure of the Company in not considering the variation in exchange rate of Swiss Franc while submitting the offer and delayed placement of PO resulted in higher cost due to variation in exchange rate, which had to be absorbed.

- (ii) The actual cost incurred on the project was ₹ 117.78 crore (including Non-Manufacturing overhead (NMOH⁷)) against the contracted price of ₹ 99.49 crore thereby resulting in a loss of ₹ 18.30 crore. Thus, the decision of the Company to quote sub ₹ 100 crore without any cover for unforeseen expenditure was imprudent as the Company failed to safeguard its interests.
- (iii) There was a delay of 29 months and the customer deducted ₹ 5.45 crore towards liquidated damages. The Company did not consider the LD in the quote on the ground that time available between opening of the Commercial Bid and Contract Signing would be utilized for advance action of procurement. However, the Company did not adhere to this as evident from the delivery dates specified in the Purchase Orders (PO) placed on the vendors. Out of 24 POs placed on the vendors, delivery due dates were after the contract completion date of November 2010 in 11 POs. The Company recovered ₹ 1.51 crore towards LD from its vendors and had to absorb the balance LD of ₹ 3.94 crore.
- (iv) Additional Warranty Support cost was not considered in the quote since back to back warranty support was asked from all vendors. However, due to difference in timings of receipt of material by BEL and supply of these items to IAF, there was mismatch in warranty coverage period. While the warranty offered of the vendors to the Company was between December 2011 and January 2015, warranty for the supplies made by the Company to IAF was upto March 2016. Consequently, the Company incurred an expenditure of ₹ 14.60 crore towards Annual Maintenance Contract (AMC).

Management stated (August 2016) that

- (i) Since it was a multi tender RFP, the ERV was not applicable and hence change in ERV resulting in loss had to be absorbed. BEL bid was prepared taking into account fluctuations of FE related information at the time of bidding and the aim was to submit an aggressive

⁷Non-Manufacturing overhead are the expenses relating to Corporate Office, General administration, canteen, medical, general R&D, expenses of respective Units, Marketing and selling expenses, and financing cost other than direct expenses. During 2012-13, NMOH considered for this project was 12.16 per cent of the Prime cost.

competitive bid to secure this prestigious project from the esteemed Defence customer.

- (ii) Keeping in view future business with the same customer and more importantly to venture into PAN India IT project, it was a strategic and conscious decision of the management to have a large IT project for Defence service customer in their profile and portfolio. Hence the risk taken was justified being a business decision. SBU had received an order worth ₹ 20 crore from Indian Army.
- (iii) At the time of signing of contract, BEL was confident of completing delivery without LD. The customer's decision of change of the Network architecture from distributed to centralized changed the entire scope for execution and implementation of e-form solution. The same resulted in delay in finalization of suitable solution provider. Though the delay is attributable to change in requirement by IAF (due to their operation/management related issues), the Company had to accept the same and additional loss of ₹ 5.45 crore towards LD had to be absorbed.
- (iv) After the expiry of back to back warranty with OEM/vendors, the project had to be supported till commencement of warranty period with IAF. Hence AMC order had to be placed on OEM/vendors to support the program and thus, the expenditure of ₹ 14.60 crore had to be absorbed.
- (v) As per the RFP/contract, scope of work was to develop e-forms. However post contract, customer wanted to run e-form over AFNET. Also integration of Wi-Max with AFNET was also initiated Post contract which involved field trials at various locations before finalizing the configuration and integration specs. This was a time taking activity and was done in 6-8 months.

The reply of the Company is not convincing in view of the following:

- As already stated above, the Company did not adhere with what it envisaged while submitting the quote. Further, BEL ventured into this project without proper assessment of the complexity of the work involved as it was aware of the requirement of materials, networking system and customization during RFP stage itself i.e. even prior to submission of the bid.
- Analysis of requirement and e-forms was required to be completed during tendering process itself. As implementation of AFNET was under progress even prior to its official inauguration (September 2010), the Company was aware of the same during the bidding process itself and hence, the reply that changes due to running e-form over AFNET

and integration of Wimax with AFNET was time consuming is not tenable.

Thus, the injudicious decision of BEL, to quote and enter into contract for establishment of Camp Area Network without considering the complexity of work involved and associated costs like Exchange Rate Variation, Warranty expenditure and impact of delay in supply, resulted in loss of ₹ 36.84⁸ crore.

The matter was reported to Ministry (November 2016); their replies were awaited (March 2017).

3.3. Development of Bharani Mark II in L-Band without customer requirement resulted in expenditure of ₹ 11.45 crore being rendered futile

Bharat Electronics Limited (BEL) proceeded to develop three Dimensional (3D) L Band radar without clearly ascertaining the specific requirement of customer. Since customer was keen on S band 3D Aslesha radar modified for meeting the Bharani Mk II requirements, decision to go for development of L band radar resulted in avoidable expenditure of ₹ 11.45 crore.

A proposal for procurement of 38 Low Level Lightweight Radar (LLLR) Mark II (Bharani Mk II) under the “Buy Indian category” based on design of Defence Research and Development Organization (DRDO) from Bharat Electronics Limited (BEL) was forwarded (July 2012) by Ministry of Defence (MoD) to BEL for comments. The proposal was sent considering that Electronics & Radar Development Establishment (LRDE) had already developed LLLR which was under manufacture by BEL for supply to Army under the contract signed (March 2011) with MoD. While the LLLR Mk I radar was 2-Dimensional⁹ L band radar, the proposed Bharani Mk II radar was envisaged as a 3-Dimensional¹⁰ surveillance radar with better altitude capability and improved operational and performance characteristics.

The Board of Directors of BEL approved (April 2013) to develop one prototype of Bharani Mk II having features similar to S band Aslesha Radar at an estimated cost of ₹ 17.36 crore including capital investment and offer it for evaluation and field demonstration to user within a time frame of 18 months of approval. The radar envisaged to be developed was a L-Band 3D radar. The Board also advised the Management to sign a detailed Memorandum of

⁸ ₹ 3.94 crore (net LD) + ₹ 18.30 crore (excess expenditure over sale price) + ₹ 14.60 crore (Warranty) = ₹ 36.84 crore.

⁹ Provide details about Speed, Azimuth and Range of the targets.

¹⁰ Determine Range, Azimuth, Range and Height of the targets.

Understanding (MoU) with LRDE since LRDE would be the system design agency for Bharani Mk II.

As per the timeline fixed by the Board, the Probable Date of Completion of Design, Develop, realize, integration, test and field the system for User Trial was October 2014. The progress in the project was delayed due to finalization of the design by LRDE and subsequently conducting the Preliminary Design Review with the user and BEL. In the meanwhile, LRDE informed (September 2014) BEL that during the Quarterly Interactive Meeting with Army Air Defence, the User showed keenness on S¹¹-Band and an Aslesha radar modified for meeting the Bharani Mk II requirements was to be fielded for user evaluation by March 2015. Due to change of band, development of L-Band was kept on hold (November 2014) and a fresh sanction was accorded (March 2015) by the Chairman and Managing Director for development of S-Band radar at an estimated cost of ₹ 4.98 crore.

Audit observed that an expenditure to the tune of ₹ 11.45 crore (including inventory) was incurred on the development of L-Band radar till March 2016 as detailed below:

Table 3.4 – Details of Expenditure incurred on Development of L-Band Radar

Item	Amount (₹ in crore)
Material	4.13
Labour	0.10
Development & Engineering (D&E) cost	6.18
Overheads	0.35
Others	0.69
Total	11.45

As the development was put on hold, most of the above expenditure was rendered futile. Audit also observed that BEL did not adhere to the directions of the Board to sign a MoU with LRDE to ensure clarity to the project and commitment from LRDE.

Management stated (September 2016) that LRDE being the designated design agency, had proposed Bharani Mk-II using semi-active phased array technology in L-band. The change in frequency band necessitated design change. Out of the total expenditure of ₹ 11.45 crore, most of the money were utilized in new development/modification/ realization of S-Band version based on Aslesha Technology and common sub-systems could be utilized in 'S' band with minor modifications as well as additional procurement against other

11 Short wave with 2 to 4 GHZ frequency

projects. Draft MoU with LRDE was prepared but due to change in band, MoU signing was put on hold.

Audit holds the view that as the requirement projected by the customer was for 3D radar, BEL, being the production agency, should have clearly ascertained the customer requirements regarding features and specifications before proceeding with the development based on the notion of what customer was asking for.

Thus, the decision of BEL to go for development of L band radar without clearly ascertaining the specific customer requirement as regards features and specifications lacked justification and resulted in a good part of expenditure of ₹ 11.45 crore being rendered futile.

The matter was reported to Ministry (September 2016); their replies were awaited (March 2017).

3.4. Delay in supply of Low Intensity Conflict Electronic Warfare System resulted in loss of ₹ 47.46 crore besides levy of liquidated damages of ₹ 8.97 crore

Improper estimation of cost and delay in submission of proposals for amendment of contract resulted in delayed execution of the project and loss of ₹ 56.43 crore including Liquidated Damages of ₹ 8.97 crore

Bharat Electronics Limited (the Company) received (August 2008) a Request For Proposal (RFP) from Ministry of Defence (MoD) for supply of one Low Intensity Conflict Electronic Warfare System¹² (LICEW). The Company submitted (February 2009) the techno commercial proposal in consortium with Electronics Corporation of India Limited¹³ (ECIL), Hyderabad for ₹ 188.83 crore which included ₹ 16.53 crore towards Annual Maintenance Contract (AMC) and ₹ 1.26 crore towards installation charges. The work share of ECIL comprised of major assembly units viz., three units of Control Centre (CC), three units of Cellular Communication Interception Subsystem (CCIS) and six units of Radio Relay Repeater Stations (RRRS) along with Engineering Support (ES) package.

As against the cost of ₹ 91.02 crore submitted (February 2009) by ECIL (₹ 71.67 crore for major assembly units, ₹ 10.75 crore for ES package and ₹ 8.60 crore for AMC), the Company, while submitting (February 2009) the

¹²LICEW System is practical mobile ground based integrated system capable of efficient functioning in an open/ built up areas in Mountainous, Plains and Jungle terrain.

¹³ECIL is a Government of India Enterprise under Department of Atomic Energy.

commercial proposal to MoD, quoted ₹ 65.01 crore without obtaining the consent of ECIL. ECIL expressed (April 2012) its inability to accept the offer on the grounds that reduced prices were commercially not viable. Consequently, the Company decided (April 2012) to relieve ECIL from the commitment of execution of their work share and to execute the entire project independently.

The Company's bid was the lowest and MoD signed (July 2011) a contract for supply of one LICEW system at a total cost of ₹ 188.83 crore. As per the contract, the deliveries were to be completed within 18 months of signing the contract i.e. 11 January 2013.

The Company completed the Project in March 2015 after a delay of 26 months by incurring a cost of ₹ 218.42 crore against which the Company realized ₹ 170.96 crore resulting in a loss of ₹ 47.46 crore against the envisaged profit of ₹ 22.10 crore as detailed below:

Table 3.5 – Details of Cost incurred by the Company on the Project

(₹ in crore)

Particulars	Estimated Cost	Actual incurred (including expenditure on installation)	Variance
Material cost	135.16	188.01	52.85
Labour cost	5.77	26.13	20.36
D & E development cost	8.01	4.28	3.73
Cost of Operation Goods/Services	148.94	218.42	69.48
Sales recognized as per contract	171.04	171.04	
Contribution (loss)	(+)22.10	(-)47.38	

Thus, the total variation from the estimated cost was ₹ 69.48 crore. The Company attributed (November 2015) the major reasons for the project incurring loss to enhancement in material content (₹ 31.79 crore) and adverse exchange rate variation (₹ 18.79 crore). Further audit analysis brought out the following:

- i. The RFP was followed by No Cost No Commitment (NCNC) demonstration which was held in December 2009. During NCNC demonstration, the following major changes were proposed by MoD:

Table 3.6 – Details of Major Changes proposed

Sl. No.	Item	RFP Requirement	Modified Requirement	Impact (₹ in crore)
1.	SDBFS entity	To be put on Gypsy Vehicle	To be put on 2.5T Vehicle provided by Army	3.60
2.	M3TR Radio	In-house developed radio	To be imported from R&S Germany	8.67
3.	CCIS entity	16 duplex channel system	24 duplex channel system	6.57

The above changes were not considered while signing the contract. Consequently, the amount quoted by the Company in response to RFP remained unchanged in the contract though there were changes to the items in the RFP.

Besides, there was change of Original Equipment Manufacturers (OEM) in respect of the following major equipments post submission of offer by the Company:

Table 3.7 – Details of Changes of OEM

(₹ in crore)

Sl. No.	Item	Modification to RFP	Impact
1.	15 KVA Generator	Change of Vendor from M/s Cummins to M/s MAK Controls	3.32
2.	25 KVA Generator	Change of Vendor from M/s Cummins to M/s MAK Controls	2.08
3.	V/UHF Exciter	Change of Vendor from M/s Microwave Electronic System to M/s Pragati Micro	0.08

Failure to ensure the requirements of the customer at the time of signing the contract (July 2011) but after submitting the quote (February 2009) resulted in additional expenditure due to change in equipment/OEM effected by the customer post submission of the quote.

- ii. As per clause 36.1 of the Contract, Exchange Rate Variation (ERV) would apply on the foreign content. Clause 36.3 of the contract stipulated that ERV clause would not be applicable in case delivery period for imported content were subsequently extended/re-fixed. As brought out above,

amendments due to change of Original Equipment Manufacturers (OEM), change of specifications, change of name of the dealer, change in address of the OEM, etc. were to be approved by MoD. The Company initiated the process of amendment in November 2012 but submitted the final proposal with full justification and supporting documents only in May 2013 i.e. almost four months after the expiry of delivery schedule (11 January 2013). The amendment due to change of OEM was approved by MoD in October 2013. Further, MoD issued three amendments (September 2013, June 2014 and March 2015) extending the delivery schedule upto 31 March 2015 with levy of Liquidated Damages (LD). Due to delay in submitting proposals for issue of amendments by MoD, the Company could not place orders for imported materials. As the amendments were approved after the lapse of stipulated delivery period, ERV on supplies received after the stipulated delivery period had to be borne by the Company. As against ₹ 94.75 crore being the value of Purchase Orders (POs) placed (October 2011 to September 2013) for imported contents based on the exchange rate specified in the contract, actual payment in respect of these POs was ₹ 113.54 crore resulting in the Company having to absorb the difference of ₹ 18.79 crore.

- iii. The work of ECIL was completed by the Company at a cost of ₹ 65.09 crore as against the quoted rate of ₹ 69.56 crore. However, delay in obtaining amendments for changes in OEM, specifications, etc. contributed to delay in delivery. MoD levied LD of ₹ 8.97 crore for the delayed supplies as the extension in delivery schedule was with levy of LD.

As a result, the Company had to incur a loss of ₹ 56.43 crore due to execution of this project.

Management stated (May 2015) in reply that

- i) As per Procurement Policy the bidder was not allowed to negotiate the technical requirements at the time of signing the contract and had to meet certain operational requirements not being part of RFP. Conscious decision was taken in view of anticipated repeated orders and forthcoming major Electronic Warfare (EW) programs.
- ii) Although the project incurred loss, immense technical knowledge was gained by executing the project which included development and that the efforts of waiver of LD were in vain because of global bidding.

The reply of the Company is not convincing as the requirement of the customer should have been ascertained during pre-bid stage and items not included in the RFP should have been discussed during the Contract

Negotiation Committee (CNC) meetings before signing of the contract. While not contesting the fact that the Company gained technical knowledge by executing the project, Audit contends that execution of the project without even recovering the material cost was not in the best interest of the Company.

Thus, due to improper estimation of cost and delay in submission of proposals for amendment of contract resulted in delayed execution of the project and consequently, the Company incurred a loss of ₹ 47.46 crore besides LD of ₹ 8.97 crore.

The matter was reported to Ministry (December 2016); their replies were awaited (March 2017).

BEML Limited

3.5. Avoidable loss of ₹ 9.56 crore due to delay in erection and commissioning of Walking Dragline

BEML Limited delayed commissioning of walking dragline and suffered consequent avoidable loss of ₹ 9.56 crore by way of Liquidated Damages.

Northern Coalfields Limited, (NCL) placed (September 2009) a Supply Order on BEML Limited (BEML) for supply of one BEML- Bucyrus W2000(33/72) Walking Dragline along with accessories and consumables at a total cost of ₹ 184.48 crore. As per the Supply Order,

- The equipment alongwith Accessories was to be delivered within 22 months on FOR Destination basis from the date of registration of contract with Customs authority.
- Failure to deliver the equipment within the stipulated delivery schedule would render BEML liable for Liquidated Damages (LD) at the rate of 0.5 *per cent* of the cost of equipment not supplied for each week or part of a week subject to a maximum of 10 *per cent*.
- BEML was responsible for the erection and commissioning within 18 months of receipt of complete equipment at site. In case of failure to commission the equipment within the stipulated period, further LD would be recovered at 0.5 *per cent* of the delivered price of the equipment alongwith the accessories per week or part thereof subject to a maximum of 5 *per cent*.

BEML placed a Purchase Order (January 2010) on M/s. Bucyrus International Inc., USA (BUCYRUS) (later renamed Caterpillar Global Mining LLC-

CGM¹⁴) for supply of one set of Completely Knocked Down (CKD) kit required for Walking Dragline W2000(33/72) with three years' guaranteed spares at a total cost of USD 2.39 crore (₹ 110.11 crore at ₹ 46.00 per USD). Further, as per the Technical and Component Supply Agreement entered (September 1998) into between BEML and BUCYRUS, BUCYRUS would render technical guidance and advise including after-sales to BEML at cost of BEML. The agreement, initially valid for five years was further extended through an amendment for further ten years from September 2004.

BEML supplied the equipment within stipulated time in September 2011 and thus, erection and commissioning was to be completed within 18 months from actual date of delivery i.e. by March 2013 in accordance with the Supply Order. The erection and commissioning was completed only in January 2015 i.e. after a delay of 22 months. NCL recovered (March 2015) ₹ 9.56 crore for delay in erection and commissioning of the Dragline towards LD.

As the Supply Order specified that delay in erection and commissioning of the Dragline would attract LD at the rate of 0.5 *per cent* of the cost of the delivered equipment per week, BEML should have ensured the erection and commissioning of the Dragline within the time stipulated in the Supply Order. Non-commissioning of the Dragline within time led to an avoidable payment of LD of ₹ 9.56 crore.

Management replied (November 2016) that:

- i. Walking Dragline of 33x72 Size was manufactured by BEML for the first time. Though skills acquired by BEML over years helped in producing the equipment, special skills required in welding the structures took time to develop.
- ii. Erection activity got delayed primarily due to customer handing over unprepared erection site.
- iii. As regards recovery of LD (₹ 9.56 crore), all out efforts were made by BEML to pursue with the NCL for refund of the amount deducted.

The reply is not convincing as

- i. BEML had not stated in its offer regarding handing over of levelled/prepared site and thus, cannot attribute the delay to NCL.
- ii. The request of BEML has not been considered by NCL and NCL refused to accept the leveling of the site area as the reason for delay since dozers, crane and other equipment were provided to BEML site-in-charge without any delay. NCL also highlighted deployment of

¹⁴Caterpillar Inc acquired M/s. Bucyrus International Inc in July 2011

insufficient and inexperienced manpower, payment issues to the labour for which they had gone on strike on few occasions, delay in boom preparation work and technical issues relating to gap between two shafts. Further, as seen from the correspondence with BUCYRUS, BUCYRUS had expressed their apprehensions regarding non-adherence of quality specification, wrong/sub-standard material usage, untrained manpower and welding & supplier Quality Assurance as these were stated to have been ignored by BEML.

Thus, BEML delayed commissioning of walking dragline and suffered consequent avoidable loss of ₹ 9.56 crore by way of LD.

The matter was reported to Ministry (November 2016); their replies were awaited (March 2017).

3.6. Idle investment due to procurement of machine without ensuring required infrastructure

Procurement of machine without ensuring required infrastructure resulted in idle investment of ₹ 13.15 crore. Further, the vision of BEML Limited to enter into aviation design, manufacturing and services remained unachieved.

BEML Limited (BEML) diversified into aerospace business by establishing (February 2009) a dedicated Aerospace Manufacturing Division at Mysore complex. The Division was to embark upon entering into aviation design, manufacturing and services. The Board of Directors of BEML approved (May 2010) capital investment of ₹ 104.13 crore and acquisition of 25 acres of land in Special Economic Zone, Bengaluru (SEZ) at an estimated cost of ₹ 40.00 crore to set up additional manufacturing facilities. As the cost of land increased, the Board approved (November 2010) investment of additional amount of ₹ 9.56 crore being the differential amount of the cost of land.

BEML took possession of 25 acres of land in Bangalore Aerospace Software Export Zone Park (BASEZP) from The Karnataka Industrial Areas Development Board (KIADB) on 26 April 2011 after payment of ₹ 49.50 crore.

BEML also placed (May 2012) an order on M/s ACB, France (ACB) for supply of one Elastoform Press machine at a cost of EURO 11.70 lakh (₹ 8.19 crore at ₹ 70 per Euro). The machine was to be delivered within 11 months from the date of issue of order and Letter of Credit (LC). Installation and commissioning of the equipment was to be completed within six weeks from

the date of receipt. LC was established on 27 July 2012 and the order was accepted by ACB on 1 August 2012.

Audit observed that the contract for Pre-engineered Building (PEB) systems for industrial facility (March 2012) and Civil Works contract (April 2012) at the BASEZP were awarded to M/s URC Constructions Private Limited (URC) at a cost of ₹ 34.72 crore and ₹ 38.43 crore respectively. As per the contracts, work of PEB was to commence from 5 March 2012 and completed by 24 June 2012 while the civil works were to commence on 16 April 2012 and completed by 15 October 2012.

The PEB contract included construction of MRO Hangar and Composite Hangar. As per the industry standard, such pre-engineered tailor made designs were to be vetted by third party certification. However, this was not done by URC despite clear provisions in the contract and hence, URC was not allowed to carry on the work. URC served (October 2012) notice of arbitration invoking the arbitration clause in the contract. The arbitrator pronounced (August 2016) the award and the same has been challenged by URC in City Civil Court, Bengaluru. Final decision of the Court was awaited (November 2016).

As the civil work was stopped, BEML requested (January 2013) ACB to hold the equipment and delay the delivery as the infrastructure facilities were not ready. ACB stated (January 2013) that the machine was unique, customised as per the requirement and could not be diverted to another customer. The machine, procured at a cost of ₹ 10.24 crore was diverted and installed (May 2015) at Mysore and as a consequence, BEML had to pay ₹ 2.43 crore towards customs duty which was exempt had the machine been installed in SEZ.

Audit contends that the decision of BEML to open LC for Elastoform Press machine on 27 July 2012 was hasty since the contracts for PEB and Civil work awarded in March 2012 and April 2012 respectively were yet to commence owing to non-compliance to contract conditions by the contractor. As the order was accepted by ACB on 1 August 2012, BEML could not back out from the commitment after refusal by ACB to delay the supply of the machine. Further, the machine procured at a cost of ₹ 12.67 crore remained idle as it could not be put to use for want of sufficient orders/infrastructure. A team from M/s Hindustan Aeronautics Limited (HAL) (a Public Sector Undertaking under the Ministry of Defence involved in production of aircraft) visited (May 2015) BEML's Mysore division to carry out capability assessment for the manufacture of sheet metal components. The team concluded that Conventional Routing facility and Heat Treatment facility which were mandatory for fabrication of sheet metal components were not available.

BEML also incurred ₹ 0.34 crore towards Project Consultancy Services and ₹ 0.14 crore towards maintenance of machine. Due to non-utilisation of the machine, the entire investment/expenditure of ₹ 13.15 crore was rendered idle/infructuous.

BEML stated (August 2016) that the required facilities would be established at ASD, Mysore on approval of capital budget 2016-17. Further it was replied that discussions were on hand with Rosoboronexport (ROE, Russian Helicopters Corp) to set-up facilities for manufacture of aviation hoses and KNEI8 Avionics and on finalisation of business terms JV/Collaboration agreement will be entered into.

The reply of BEML indicated the lack of urgency to complete the facilities and the investments were initiated without proper planning. It also confirmed that there was no progress (August 2016) in offset program for aerospace business opportunities.

Thus, procurement of machine without ensuring required infrastructure resulted in idle investment of ₹ 13.15 crore. Further, the vision of BEML to enter into aviation design, manufacturing and services remained unachieved.

The matter was reported to Ministry (September 2016); their replies were awaited (March 2017).

Garden Reach Shipbuilders & Engineers Limited

3.7. Excess expenditure on purchase of Advanced Composite Communication System from BEL for Landing Craft Utility project

Failure of Garden Reach Shipbuilders & Engineers Limited in taking up the proposal for modification as prescribed in the contract resulted in extra expenditure of ₹ 12.74 crore.

Ministry of Defence (MoD), Government of India entered into (September 2011) a contract with Garden Reach Shipbuilders & Engineers Limited, Kolkata (GRSE) for construction and delivery of eight Landing Craft Utility Mk IV Vessels (LCU MK-IV). Clause 37.1 of the Contract stipulated that during the progress of work, should either of the parties propose any modifications or alterations and additions to the approved drawings or any changes to the specifications, the parties should raise appropriate modification forms as per Annexure V of the Contract. Clause 37.3.1 stated that GRSE should forward the details of the proposed modification indicating the time and cost implications to MoD at the earliest but not exceeding six weeks. Clause 37.5 of the Contract prescribed that in the event that any of the materials required by the specifications could not be procured/not delivered by

the nominated supplier or were in short supply, GRSE may supply other material capable of meeting the requirements provided that MoD agrees in writing.

LCU included Advanced Composite Communication System (ACCS) and the nominated vendors were M/s Bharat Electronics Limited (BEL), M/s Electronics Corporation of India Limited (ECIL) and M/s Tata Power SED, Mumbai. As per Statement of Requirement (SOR) prepared (November 2011) by GRSE for ACCS, model PAE 3060 was considered for V/UHF trans-receiver, which was one of the components of ACCS. The estimated cost of ACCS at ₹ 54.26 crore was based on the quote received from BEL in October 2010 considering PAE 3060 model V/UHF trans-receiver. GRSE invited (December 2011) tenders from BEL, ECIL and Tata Power for supply of ACCS. In the pre-bid meeting (December 2011) between GRSE, ECIL and BEL to discuss the technical issues, BEL offered to supply latest version of model M7 V/UHF trans-receiver in ACCS instead of model PAE 3060 V/UHF trans-receiver due to obsolescence. Offer was received (January 2012) only from BEL who had quoted ₹ 89.30 crore which was subsequently revised (July 2012) to ₹ 93.20 crore. GRSE held technical/commercial negotiations with BEL between August 2012 and May 2013 and placed (July 2013) orders for eight ACCS systems at ₹ 67.00 crore after negotiations.

GRSE sought (April 2013) compensation from Integrated Headquarters (Navy) (IHQ (N)) for the differential cost for providing the latest PAE M7 V/UHF trans-receiver in ACCS. IHQ(N), while not agreeing to the claim, stated (April 2013) that the procurement of ACCS as per build specification/approved technical specification was the contractual liability of GRSE and IHQ had not sought change in the technical specification of the ACCS system submitted by OEM. Therefore, escalation of project cost on this account in respect of fixed price contract was not viable.

Audit contends that GRSE failed to adhere to the provisions of the contract in submitting the proposals for modifications. While BEL offered to supply latest version of model M7 V/UHF trans-receiver in place of Model PAE 3060 V/UHF trans-receiver in December 2011 itself and GRSE was aware of the significant difference between the prices of two models in July 2012 consequent on opening of BEL's price bids, GRSE should have immediately taken up with MoD for modification of the item in terms of the contract. Failure of GRSE in taking up the proposal for modification as prescribed in the contract resulted in extra expenditure of ₹ 12.74 crore¹⁵.

¹⁵ ₹67.00 crore – ₹54.26 crore

GRSE replied (November 2016) that though the budgetary quote was for PAE 3060 model, the price bid was for PAE-M7 model which was technologically more advanced version as model PAE 3060 was discontinued by ECIL. The negotiated price was 23 per cent more than the estimate. Considering the gap of more than 2 ½ years from budgetary quote validity date (March 2011) till placement of order (July 2013), the normal price escalation came to 14 per cent and balance 9 per cent could be attributable to advanced specifications/features. Further, it stated that the matter regarding the increased cost of ACCS due to upgraded model and other factors were brought to the notice of the customer representatives on multiple occasions. As IHQ(N) did not agree to the reimbursement of increase in price, GRSE had to proceed with bearing the extra cost to avoid delays in delivery of materials which have ultimately impacted the project timelines.

The reply is not convincing since GRSE should have taken up the proposal for modification indicating time and cost implication with the MoD within the timeframe as per the terms of the contract.

Thus, failure of GRSE in taking up the proposal for modification as prescribed in the contract resulted in extra expenditure of ₹ 12.74 crore.

The matter was reported to Ministry (December 2016); their replies were awaited (March 2017).

Vignyan Industries Limited

3.8. Avoidable loss due to abnormal rejections of steel castings

Failure to carry out effective quality checks before okaying the goods for delivery to customers resulted in a loss of ₹ 2.77 crore by way of customer rejections during the last five years period ending 2015-16.

Vignyan Industries Limited (VIL), a subsidiary of M/s BEML Limited (BEML) is Steel Casting Foundry. VIL specialises in manufacturing components for Earth Moving Machinery, Valves, Die Casting Machines, Ropeways and Automobiles. VIL was a Captive Foundry to BEML alone till 2015-16 and now it has extended its supplies to important customers like HMT, BHEL, KCPL, HML, and Indian Railways. VIL has also diversified its production into Ductile Iron Castings. VIL also received an order from M/s. Midhani for supply of 100 MT U2 grade steel castings during 2015-16.

The main raw material used in the manufacture of castings is iron and steel scrap which is melted in furnaces and the liquid metal obtained is poured into moulds to get castings of required specifications.

The details of sales of the Company, sales made to holding Company and rejections thereon during the period from 2011-12 to 2015-16 are furnished below:

Table 3.8 – Details of Sales and Rejections**(₹ in crore)**

Particulars	2011-12	2012-13	2013-14	2014-15	2015-16
Sales (in MT)	3608.00	2181.00	2725.00	2210.00	2285.00
Rejections (in MT)	239.00	133.00	74.00	48.00	94.00
Percentage of Rejections to Sales	6.62	6.10	2.72	2.17	4.11
Allowable Rejections (at 1.5 per cent) (in MT)	54.12	32.72	40.88	33.15	34.28
Excess Rejections (in MT)	184.88	100.29	33.13	14.85	59.73
Cost per MT (in ₹)	99,970.00	96370.00	1,01,360.00	1,11,340.00	1,03,160.00
Value of Excess Rejections (₹ in crore)	1.85	0.97	0.34	0.16	0.62
Less: Rejected Materials purchased by VIL at a rate of ₹30,000.00 per MT and reprocessed (₹ in crore)	0.55	0.30	0.10	0.04	0.18
Value of Rejections after allowing for Scrap (₹ in crore)	1.30	0.67	0.24	0.12	0.44

As could be seen from the above, customer rejections ranged from 2.17 per cent to 6.62 per cent and was above the industry norm of 1.5 per cent in all the five years from 2011-12 to 2015-16. The rejected castings are re-melted for producing new castings. The total value of rejections over and above the industry norm after allowing for reprocessing worked out to ₹ 2.77 crore.

Loss due to abnormal rejections was pointed out in Report No. 12 of the Comptroller & Auditor General of India for the year 2006. In response, the BEML had stated (January 2007) that Magnaflex Detector machine was supplied (October 2006) by BEML for detecting minute defects and to bring down the rejections. Ministry had further stated that rejections were steadily coming down ever since VIL took corrective action and the Ministry had further advised VIL to bring down the rejections within the industry norms. However, no effective corrective measures were taken as promised by the

Management/Ministry as evident from the loss being more than the industry norm even after nine years.

Management replied (November 2016) that:

- a) The manufacturing process, machinery and technology at VIL remained the same since last 10 years. The technology and manufacturing process are largely manual and less automated leading to manual errors and rejections more than the best automated steel foundries. Hence the automated industrial norm of 1.5 *per cent* may not be feasible for VIL conditions.
- b) VIL procured and installed (September 2009) Fast Loop Molding System for ₹ 8.95 crore and because of this the rejections has come down from 6.62 *per cent* during 2011-12 to 4.11 *per cent* during 2015-16.
- c) During 2016-17, VIL has taken up repair, reconditioning and procurement action to increase the quantity of production, to get standard quality of products and to avoid production loss in case of rain. Board approval has been taken for modernization and up gradation of existing machinery in a planned manner (most critical facilities directly having likely impact on the quality of castings) during the year 2016-17 and 2017-18.

The reply is not convincing due to the following:

Rejections at customer's end should be minimum and a rejection of upto 6.62 *per cent* indicates laxity in quality control mechanism. Old machinery or manufacturing process might lead to excessive internal rejections but rejections by customers have nothing to do with old machinery/manufacturing process. These reflect that VIL neither cares to value its own credibility/goodwill nor does it show sense of commitment towards its customers.

VIL needs to investigate how the defective goods could be cleared for delivery to the customers and take action against the persons responsible for such carelessness. VIL also need to study how the customers could detect those deficiencies and should strengthen the pre-delivery quality checks.

Thus, failure to carry out effective quality checks before okaying the goods for delivery to customers resulted in a loss of ₹ 2.77 crore by way of customer rejections during the last five years period ending 2015-16.

The matter was reported to Ministry (November 2016); their replies were awaited (March 2017).

CHAPTER IV

4.1 Follow up on Audit Reports

Audit Reports of the CAG represent the culmination of the process of scrutiny of accounts and records maintained in various offices and departments of CPSEs. It is, therefore, necessary that appropriate and timely response is received from the executive on the audit findings included in the Audit Reports.

The Lok Sabha Secretariat requested (July 1985) all the Ministries to furnish notes (duly vetted by Audit) indicating remedial/corrective action taken by them on various paragraphs/appraisals contained in the Audit Reports (Commercial) of the CAG as laid on the table of both the Houses of Parliament. Such notes were required to be submitted even in respect of paragraphs/appraisals which were not selected by the Committee on Public Sector Undertakings (COPU) for detailed examination. The COPU in its Second Report (1998-99-Twelfth Lok Sabha), while reiterating the above instructions, recommended:

- setting up of a monitoring cell in each Ministry for monitoring the submission of Action Taken Notes (ATNs) in respect of Audit Reports (Commercial) on individual Public Sector Undertakings (PSUs);
- setting up of a monitoring cell in Department of Public Enterprises (DPE) for monitoring the submission of ATNs in respect of Reports containing paras relating to a number of PSUs under different Ministries; and
- submission to the Committee, within six months from the date of presentation of the relevant Audit Reports, the follow up ATNs duly vetted by Audit in respect of all Reports of the CAG presented to Parliament.

In the meeting of the Committee of Secretaries (June 2010) it was decided to make special efforts to clear the pending ATNs/ATRs on CAG Audit Paras and PAC recommendations within the following three months. While conveying this decision (July 2010), the Ministry of Finance recommended institutional mechanism to expedite action in the future.

While reviewing the follow up action taken by the Government on the above recommendations, the COPU in its First Report (1999-2000-Thirteenth Lok Sabha) reiterated its earlier recommendations that the DPE should set up a separate monitoring cell in the DPE itself to monitor the follow-up action taken by various Ministries/Departments on the observations contained in the Audit Reports (Commercial) on individual undertakings. DPE informed

(March 2015) that a separate monitoring cell had been set up to monitor the follow up on submission of ATNs by the concerned administrative Ministries/Department. DPE also informed that they had also requested all the concerned departments having jurisdiction over CPSEs to set up Monitoring Cells in their department.

A review in Audit revealed that ATNs in respect of 15 paragraphs pertaining to Defence PSUs were pending as of March 2017 (**Annexure IV**) of which ATNs for 4 paragraphs were not received at all (**Annexure V**).

New Delhi
Dated : 29 May 2017


(NAND KISHORE)
Deputy Comptroller and Auditor General

Countersigned

New Delhi
Dated : 29 May 2017


(SHASHI KANT SHARMA)
Comptroller and Auditor General of India

ANNEXURE - I

(Para No. 2.1.2.2)

Statement showing original dates; revised dates with no. of times revised and achieved dates

(Delay in months')

Major events	3017				3018				3019				3020			
	Original	Revised (no. of revisions)	Actuals	Delay	Original	Revised (no. of revisions)	Actuals	Delay	Original	Revised (no. of revisions)	Actuals	Delay	Original	Revised (no. of revisions)	Actuals	Delay
Start production	June 2004	March 2006 (3)	March 2006	21	March 2007	---	March 2007	-	March 2008	--	March 2008	-	September 2009	--	September 2009	-
Keel laying	February 2005	November 2006 (3)	November 2006	21	September 2007	---	September 2007	-	September 2008	August 2010 (2)	August 2010	22	January 2011	January 2012 (1)	January 2012	12
Launching	August 2006	April 2010 (6)	April 2010	44	May 2009	October 2011 (3)	October 2011	29	January 2010	March 2013(3)	March 2013	38	January 2013	May 2015 (7)	May 2015	28
Delivery	August 2008	October 2014(6)	July 2014	74	March 2011	July 2013 (3)	November 2015	24	September 2011	November 2016 (3)	ND*	62	January 2015	November 2017 (2)	ND*	34

(Note : ND* = Not delivered)

ANNEXURE - II

(Para No. 2.1.2.4)

Statement showing list of SOTRs for major weapons and sensors

Sl.No	Weapons & Sensors	Date of approval	Date of Amendments	No of Amendments	Time gap between LOI and approval	Time gap between LOI and latest amendment
1.	Lynx	14.06.2004	07.06.2006	1	14 months	38 months
2.	AK 630	15.07.2005	10.05.2006	1	27 months	37 months
3.	Active Towed Array Sonar(ATAS) – Nagan	08.05.2006	22.11.2006	1	37 months	43 months
4.	Composite Communication System (CCS)	25.10.2005	18.11.2005 27.11.2006	2	30 months	43 months
5.	Combat Management System(CMS)	07.02.2006	18.09.2006 28.09.2006 16.11.2006 31.01.2007 11.06.2009	5	34 months	74 months
6.	Hull Mounted Sonar (HUMSA)	06.07.2005	21.11.2006	1	27 months	43 months
7.	IACMOD-C	02.07.2005	09.12.2006 20.12.2006	2	27 months	44 months
8.	Integrated Platform Management System (IPMS)	30.5.2007	17.08.2007 15.11.2007 26.12.2007	3	49 months	56 months
9.	Indigenous Anti-submarine Rocket Launcher (IRL)	20.05.2004	06.12.2005	1	13 months	32 months

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10.	Indigenous Twin-tube Torpedo Launcher (ITTL)	22.06.2005	12.12.2005	1	26 months	32 months
11.	KAVACH MOD-II	13.08.2005	13.06.2006	1	28 months	38 months
12.	REVATHI	30.07.2005	14.09.2005 23.02.2006 18.11.2008	3	27 months	67 months
13.	Shipwide Data Network (SDN) 28	22.06.2005	07.07.2005 31.08.2006 18.12.2008	3	26 months	68 months
14.	Super Rapid Gun Mount (SRGM)	24.08.2004	17.03.2005	1	16 months	23 months

ANNEXURE - III

(Para no. 2.1.2.7)

Statement showing extension and delays in delivery of the major equipment by indigenous vendors for ASW Corvette

Sl. No	Equipment	Name of the vendor/s	Tender	PO No.	PO Date	PO value (₹. In crore)	Range of schedule delivery	No. of Amendments	Delivery extended upto	Supplies completed on	Extended period	Delay in supply
											In Month	
A	B	C	D	E	F	G	H	I	J*	K	L (H-J)	M (H-K)
1	CCS MK III	BEL, Bangalore	S	4500010741-44	26.12.06	115.00	Dec. 08 - Jun. 11	06-12	Sep.11 - May 12	Nov. 11 - Sept. 14	09-41	17-69
		3017		4500010741	26.12.06	30.08	Dec-08	12	May-12	Sep-14	41	69
		3018		4500010742	26.12.06	27.89	Dec-09	10	Sep-12	Oct-12	33	34
		3019		4500010743	26.12.06	28.17	Jun-10	06	Sep-11	Nov-11	15	17
		3020		4500010744	26.12.06	28.86	Jun-11	07	Mar-12	Apr-13	09	22
2	SDN-28	BEL, Bangalore	S	4500009825-28	18.09.06	111.00	Aug.08 - Feb.11	06-08	Aug. 12	Sept.11 - Apr.12	18-48	14-37
		3017		4500009825	18.09.06	28.67	Aug-08	08	Aug-12	Sep-11	48	37
		3018		4500009826	18.09.06	26.92	Aug-09	08	Aug-12	Mar-12	36	31
		3019		4500009827	18.09.06	27.31	Feb-10	06	Aug-12	Jan-12	30	23
		3020		4500009828	18.09.06	28.09	Feb-11	06	Aug-12	Apr-12	18	14
3	Link II	BEL, Bangalore	S	4700003153-56	02.11.11	30.60	Aug.12-Oct.12	02	Apr-14	Aug.13 - Sept.15	18-20	10-37
		3017		4700003153	02.11.11	7.69	Oct-12	02	Apr-14	Aug-13	18	10
		3018		4700003154	02.11.11	7.64	Aug-12	02	Apr-14	Sep-15	20	37
		3019		4700003155	02.11.11	7.64	Aug-12	02	Apr-14	Sep-15	20	37
		3020		4700003156	02.11.11	7.64	Aug-12	02	Apr-14	Sep-14	20	25

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Sl. No	Equipment	Name of the vendor/s	Tender	PO No.	PO Date	PO value (₹. In crore)	Range of schedule delivery	No. of Amendments	Delivery extended upto	Supplies completed on	Extended period	Delay in supply
											In Month	
A	B	C	D	E	F	G	H	I	J*	K	L (H-J)	M (H-K)
4	ESM SANKET	BEL, Bangalore	S	4500010757-60	26.12.06	87.00	Aug.08 - Feb.11	04-07	Mar.12 - Oct.12	Jan.13 - Oct.15	13-43	23-86
		3017		4500010757	26.12.06	21.75	Aug-08	04	Mar-12	Oct-15	43	86
		3018		4500010758	26.12.06	21.75	Aug-09	07	Mar-12	Oct-15	31	74
		3019		4500010759	26.12.06	21.75	Feb-10	05	Oct-12	Apr-13	32	38
		3020		4500010760	26.12.06	21.75	Feb-11	05	Mar-12	Jan-13	13	23
5	ATM SWITCH	BEL, Bangalore	S	4500012760-63	04.07.07	19.64	Feb.09 - Aug.11	04-07	Sep.11 - Feb.12	Nov.11 - Dec.12	06-31	7-40
		3017		4500012760	04.07.07	5.21	Feb-09	07	Sep-11	Jun-12	31	40
		3018		4500012761	04.07.07	4.70	Dec-09	05	Sep-11	Nov-11	21	23
		3019		4500012762	04.07.07	4.79	Aug-10	05	Sep-11	Dec-12 (Supply yet to be completed)	13	28
		3020		4500012763	04.07.07	4.93	Aug-11	04	Feb-12	Mar-12	06	7
6	FCS IAC (MOD- C)	BEL, Bangalore	S	4500010753-56	26.12.06	50.58	Dec.08 - Jun.11	06-10	Apr-13	Apr.12 - Aug.13	22-52	25-42
		3017		4500010753	26.12.06	12.91	Dec-08	10	Apr-13	Jun-12	52	42
		3018		4500010754	26.12.06	12.33	Dec-09	07	Apr-13	Apr-12	40	28
		3019		4500010755	26.12.06	12.50	Jun-10	06	Apr-13	Jul-12	34	25
		3020		4500010756	26.12.06	12.84	Jun-11	06	Apr-13	Aug-13	22	26
7	HUMSANG	BEL, Bangalore	S	4500010745-48	26.12.06	98.80	Dec.08 - Jul.11	07-11	May-13	Apr.13 - Mar.15	22-53	44-52
		3017		4500010745	26.12.06	25.24	Dec-08	11	May-13	Apr-13	53	52
		3018		4500010746	26.12.06	24.06	Dec-09	07	May-13	Sep-13	41	45
		3019		4500010747	26.12.06	24.40	Jul-10	07	May-13	Mar-14	34	44
		3020		4500010748	26.12.06	25.10	Jul-11	07	May-13	Mar-15	22	44

Sl. No	Equipment	Name of the vendor/s	Tender	PO No.	PO Date	PO value (₹. In crore)	Range of schedule delivery	No. of Amendments	Delivery extended upto	Supplies completed on	Extended period	Delay in supply
											In Month	
A	B	C	D	E	F	G	H	I	J*	K	L (H-J)	M (H-K)
8	CMS-28	BEL, Bangalore	S	4500011060-63	07.02.07	30.04	Jan.09 - Jul.11	04-13	May-12	Mar.12 - Aug.13	10-40	25-53
		3017		4500011060	07.02.07	8.27	Jan-09	13	May-12	Jun-13	40	53
		3018		4500011061	07.02.07	7.26	Nov-09	08	Mar-12	Mar-12	28	28
		3019		4500011062	07.02.07	7.26	Jul-10	06	May-12	Jun-13	22	35
		3020		4500011063	07.02.07	7.26	Jul-11	04	May-12	Aug-13	10	25
9	FCS LYNX U1	BEL, Bangalore	S	4500008990-93	28.06.06	400.00	Jan.09 - Jul.11	08-13	Jun 12 - Mar 16	Jul.12- Apr.16	41-56	42-68
		3017		4500008990	28.06.06	103.89	Jan-09	13	Jun-12	Jul-12	41	42
		3018		4500008991	28.06.06	96.75	Jan-10	08	Jun-12	Oct-13	45	45
		3019		4500008992	28.06.06	98.20	Jul-10	09	Mar-14	Mar-16	44	68
		3020		4500008993	28.06.06	101.15	Jul-11	13	Mar-16	Apr-16	56	57
10	V/UHF DF ELK 7036	BEL, Bangalore	S	4500012902-05	14.07.07	24.76	Sept.08 - Mar. 11	No Data available		Sept. 11 - Aug.16		12-77
		3017		4500012902	14.07.07	8.49	Sep-08			Sep-11		36
		3018		4500012903	14.07.07	5.43	Sep-09			Feb-12		29
		3019		4500012904	14.07.07	5.43	Mar-10			Aug-16		77
		3020		4500012905	14.07.07	5.43	Mar-11			Mar-12		12
11	Revati Radar	BEL, Ghaziabad	S	4500007789-92 4700002842-43	10.03.06 27.09.11	213.84	Oct.08 - Aug.14	03-10	Jun 12 - Mar 16	Apr.14 -Aug.16	22-67	24-67
		3017		4500007789	10.03.06	48.29	Oct-08	07	Jun-12	May-14	67	67
		3018		4500007790	10.03.06	46.78	Mar-09	10	Jun-12	Apr-14	33	61
		3019		4700002842	27.09.11	59.38	Sep-13	04	Mar-16	Mar-16	30	30
		3020		4700002843	27.09.11	59.38	Aug-14	03	Jun-16	Aug-16	22	24

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Sl. No	Equipment	Name of the vendor/s	Tender	PO No.	PO Date	PO value (₹. In crore)	Range of schedule delivery	No. of Amendments	Delivery extended upto	Supplies completed on	Extended period	Delay in supply
											In Month	
A	B	C	D	E	F	G	H	I	J*	K	L (H-J)	M (H-K)
12	CHAFF / KAVACH - MOD -II	MTPF, Ambernath	S	4500009618-21	01.09.06	15.90	May.08 - Nov.10	05-09	Dec. 13	Aug.13 - Jan.16	35-67	62-74
		3017		4500009618	01.09.06	3.97	May-08	09	Dec-13	Aug-13	67	63
		3018		4500009619	01.09.06	3.97	May-09	05	Dec-13	Jul-15	55	74
		3019		4500009620	01.09.06	3.97	Nov-09	05	Dec-13	Jan-16	47	74
		3020		4500009621	01.09.06	3.97	Nov-10	05	Dec-13	Jan-16	35	62
13	IRL	L&T, MUM-BAI	S	4500007172-87	17-19.12.05	48.30	Feb.08-Oct.10	06-09	Nov.13-Oct.15	Sept.14 - Jun.16	63-72	68-80
		3017		4500007172	17.12.05	11.62	Feb-08	09	Feb-14	Sep-14	72	79
		3018		4500007185	19.12.05	11.98	Feb-09	07	Nov-13	Nov-15	57	79
		3019		4500007186	19.12.05	12.35	Oct-09	06	Oct-15	Jun-16	72	80
		3020		4500007187	19.12.05	12.35	Oct-10	06	Jan-16	Jun-16	63	68
14	SRGM 76/62	BHEL, Haridwar	S	4500007118-21	07.12.05	114.73	May09-Jan.11	02-06	Nov.11-Sept.13	Apr.11-Jun.13	30-42	15-49
		3017		4500007118	07.12.05	29.33	May-08	06	Nov-11	before 2011	42	0
		3018		4500007119	07.12.05	27.90	May-09	05	Nov-11	Jun-13	30	49
		3019		4500007120	07.12.05	28.39	Jan-10	05	Jul-12	Apr-11	30	15
		3020		4500007121	07.12.05	29.11	Jan-11	02	Sep-13	Nov-12	32	22
15	AK 630 M	OFB/GSF, Cossipore	S	4500009571-74	30.08.06	31.52	May08- Jan.11	04-07	May 13-Mar16	Aug.15-Mar.16	48-73	62-87
		3017		4500009571	30.08.06	7.88	May-08	04	Jun-13	Aug-15	61	87
		3018		4500009572	30.08.06	7.88	May-09	05	May-13	Nov-15	48	78
		3019		4500009573	30.08.06	7.88	Jan-10	04	Feb-16	Feb-16	73	73
		3020		4500009574	30.08.06	7.88	Jan-11	07	Mar-16	Mar-16	62	62

Sl. No	Equipment	Name of the vendor/s	Tender	PO No.	PO Date	PO value (₹. In crore)	Range of schedule delivery	No. of Amendments	Delivery extended upto	Supplies completed on	Extended period	Delay in supply
											In Month	
A	B	C	D	E	F	G	H	I	J*	K	L (H-J)	M (H-K)
16	Disel Engine	KOEL	S	4500008296-99	04.05.06	159.36	Oct.07- Apr.09	05-08	Aug.14-Aug.15	May13-Aug.13	76-84	49-70
		3017		4500008296	04.05.06	38.28	Oct-07	06	Aug-14	Aug-13	82	70
		3018		4500008297	04.05.06	39.48	Aug-08	08	Aug-15	May-13	84	57
		3019		4500008298	04.05.06	40.19	Apr-09	05	Aug-15	May-13	76	49
		3020		4500008299	04.05.06	41.41	Apr-09	05	Aug-15	May-13	76	49
17	Directing Gear for Sonar Humsa	BEL, Bangalore	S	4500023891-94	03.09.10	27.54	Nov.11-Jan.14	01-08	Jan.14-Mar.16	Jul.13- Apr.14	0-29	0-20
		3017		4500023891	03.09.10	7.48	Nov-11	08	Apr-14	Jul-13	29	20
		3018		4500023892	03.09.10	6.27	Nov-11	04	Apr-14	Jul-13	29	20
		3019		4500023893	03.09.10	6.90	Jan-14	02	Mar-16	Mar-14	26	02
		3020		4500023894	03.09.10	6.90	Jan-14	01	Jan-14	Apr-14	0	03
18	HVAC	YORK	S	4500013447-50	03.09.07	62.85	Jan.08-Jun.10	07-13	Apr.12-Jul.16	Nov.14- Mar.16	51-90	69-92
		3017		4500013447	03.09.07	14.87	Jan-08	13	Apr-12	Nov-14	51	82
		3018		4500013448	03.09.07	15.98	Sep-08	13	Mar-16	May-16	90	92
		3019		4500013449	03.09.07	14.94	Jun-09	08	Jul-16	Mar-16	85	81
		3020		4500013450	03.09.07	17.06	Jun-10	07	Dec-15	Mar-16	66	69
				TOTAL		1641.46	crore					

Yard	PO value	Extension (Range in Months')	Delay (Range in Months')
3017	413.92	18-82	10-87
3018	394.97	20-90	20-92
3019	411.45	13-85	02-81
3020	421.12	06-66	03-69

* Extended delivery date or date of last amendments.

** Table prepared based on the data generated from SAP.

ANNEXURE - IV

(Para No. 4.1)

Year-wise/Report-wise pending position of ATNs

Sl No	Report No/Year	No. of Reports/paras on which ATNs have not been submitted even for the first time	No. of Reports/paras on which revised ATNs are awaited
(1)	(2)	(3)	(4)
1.	13 of 2013	1	-
2.	13 of 2014	-	2
3.	35 of 2014	-	2
4.	37 of 2015		3
5.	38 of 2015	2	1
6.	44 of 2015	-	3
7.	19 of 2016	1	-
Total		4	11

ANNEXURE - V

(Para No. 4.1)

Details of Reports/paras on which ATNs have not been received even for the first time

Sl. No.	Name of the Ministry/Department.	Report No/Year	Para No.	Title of the Report/Para	Date of laying in the Parliament
1.	Ministry of Defence (Airforce)	13 of 2014	Chapter VII Para 7.1	Irregular encashment of casual leave	1 August 2014
2.	Ministry of Defence (Airforce)	38 of 2015	Chapter IV Para 4.2	Investment in Joint Venture Companies in HAL	18 December 2015
3.			Chapter IV Para 4.3	Acceptance of contract for DARIN-III with fixed delivery schedule led to liquidated damages.	
4.	Ministry of Defence (Army)	19 of 2016	Chapter VIII Para 8.2	Avoidable loss due to non-availing of Customs Duty Exemption	26 July 2016