

**Report of the  
Comptroller and Auditor General of India  
for the year ended March 2016**



**Union Government (Defence Services)  
Navy and Coast Guard  
Report No. 20 of 2017**

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

**for the year ended March 2016**

**Presented in Lok Sabha on:**

**Laid in Rajya Sabha on:**

**Union Government (Defence Services)  
Navy and Coast Guard  
Report No. 20 of 2017**



# CONTENTS

	Paragraph	Page
<b>Preface</b>		<b>iii</b>
<b>Glossary of Terms</b>		<b>v</b>
<b>Overview</b>		<b>ix</b>
<b>CHAPTER I: INTRODUCTION</b>		
Profile of the audited entities	1.1	1
Authority for audit	1.2	3
Audit methodology and procedure	1.3	3
Defence Budget	1.4	3
Budget and Expenditure of Navy	1.5	4
Budget and Expenditure of Coast Guard	1.6	8
Receipts of the Navy and Coast Guard	1.7	10
Response to Audit	1.8	11
About the Report	1.9	12
<b>CHAPTER II: PERFORMANCE AUDIT ON THE INVENTORY MANAGEMENT OF NAVAL STORES, EQUIPMENT AND SPARE PARTS IN INDIAN NAVY</b>		
Background	2.1	13
Provisioning	2.3	23
Procurement	2.4	33
Demand Compliance	2.5	40
Inventory Holding	2.6	45
Integrated Logistics Management System	2.7	56
Conclusion	2.8	61

<b>CHAPTER III: MINISTRY OF DEFENCE- INDIAN NAVY</b>		
Accidents of ships and submarines in Indian Navy	3.1	63
Functioning of Marine Gas Turbine Overhaul facility	3.2	90
Operation and Maintenance of UH-3H helicopters	3.3	108
Risky exploitation of Sindhughosh class submarines due to delay in installation of periscopes	3.4	116
Non-installation of a mandatory system compromising the flight safety of aircraft	3.5	119
Fleet tankers rendered vulnerable due to delay in fructification of offset obligation	3.6	122
Deficient small arms practice firing by Naval Officers in Delhi Area	3.7	124
Unwarranted procurement of aero-engines for a helicopter fleet	3.8	127
Avoidable procurement and installation of Mobile Satellite Service Terminal for an aircraft	3.9	130
Procurement of weather radars for Dornier aircraft	3.10	131
Avoidable expenditure on procurement of rice	3.11	133
<b>CHAPTER IV: MINISTRY OF DEFENCE- INDIAN COAST GUARD</b>		
Irregular payment of ₹5.23 crore as Foreign Exchange Rate Variation to a shipyard	4.1	135
<b>ANNEXURE</b>		
Annexure-I		137
Annexure-II		138
Annexure-III		139
Annexure-IV		140
Annexure-V		142
Annexure-VI		144
Annexure-VII		145
Annexure-VIII		146

## **PREFACE**

*This Report for the year ended March 2016 has been prepared for submission to the President of India under Article 151 of the Constitution of India.*

*The Report contains significant results of the Audit of the Union Government (Defence Services)- Indian Navy and Indian Coast Guard.*

*The instances mentioned in this Report are those, which came to notice in the course of test audit for the period 2015-16 as well as those which came to notice in earlier years, but could not be reported in the previous Audit Reports; instances relating to the period subsequent to 2015-16 have also been included, wherever necessary.*

*The audit has been conducted in conformity with the Auditing Standards issued by the Comptroller and Auditor General of India.*



***GLOSSARY  
OF  
TERMS***





<b>Glossary of Terms</b>	
AAFDS	Addressable Automatic Fire Detection System
ABC	Always Better Control
ABER	Anticipated Beyond Economical Repair
ACL	Annual Consumption level
AFT	Annual Flying Task
ALH	Advanced Light Helicopter
AoG	Aircraft on Ground
APA	Annual Practice Allowance
ARD	Annual Review of Demands
ARP	Annual Review Programme
ARS	Automatic Replenishment System
ASPA	Aircraft Service Period Adjustment
ATN	Action Taken Note
B&D Spares	Base and Depot Spares
BER	Beyond Economical Repair
BoI	Board of Inquiry
CAAT	Computer Assisted Audit Techniques
CAGAC	Collision and Grounding Analysis Cell
CAT 'A'	Critical Items Category 'A'
CCM	Category Co-efficient for Minimum Stock Level
CCU	Category Co-efficient for Upper Stock Level
CETS	Contractor Engineering Technical Services
CFA	Competent Financial Authority
CGHQ	Coast Guard Headquarters
C-in-C	Commander-in-Chief
CIDS	Chief Integrated Defence Staff
CMP	Controller of Material Planning
CNC	Contract Negotiation Committee
CNO	Confidential Navy Order
COL	Controller of Logistics
COM	Chief of Material
COMCOS(W)	Commodore Commanding Submarines(West)
COMSAT	Command Level Safety Audit Team
CPRO	Controller of Procurement
CTS	Controller of Technical Services

CWH	Controller of Warehousing
DAC	Defence Acquisition Council
DALS	Directorate of Air Logistics Support
DGNO	Director General Naval Operations
DGNP	Director General Naval Projects
DGS&D	Director General of Supplies & Disposal
DNAM	Directorate of Naval Air Material
DPP	Defence Procurement Procedure
DPR	Draft Project Report
DPRO	Directorate of Procurement
DLS	Directorate of Logistics Support
E&SP	Equipment & Spare parts
ECDIS	Electric Chart Integrated Display System
ELBA	Extended Line Breaking Apparatus
ENC	Eastern Naval Command
ERA	Engine Room Artificer
FA	Financial Advisor
FERV	Foreign Exchange Rate Variation
FOC-in-C	Flag Officer Commanding-in-Chief
FOSM	Flag Officer Submarines
FOST	Flag Officer Sea Training
FPQ	Final Procurement Quantity
GTs	Gas Turbine
GTGs	Gas Turbine Generators
GSL	M/s Goa Shipyard Limited
HAL	M/s Hindustan Aeronautics Limited
HAT	Harbour Acceptance Trials
HQNA	Headquarters Naval Aviation
IHQ, MoD	Integrated Headquarters, Ministry of Defence
ICAO	International Civil Aviation Organisation
IFA	Integrated Financial Advisor
ILMS	Integrated Logistics Management System
INAP-2	Indian Navy Air Publication-2
INAS	Indian Naval Air Squadron
INBR	Indian Naval Book of Reference
INCAT	Indian Naval Catalogue of Stores

IDT	Inter Depot Transfer
IRPCS	International Regulations for Prevention of Collision at Sea
LOA	Letter of Offer and Acceptance
LRMR	Long Range Maritime Reconnaissance
LTE	Limited tender Enquiry
LP	Local Purchase
LPD	Landing Platform Dock
LPP	Last Purchase Price
M& S	Machinery and Spares
MGTOC	Marine Gas Turbine Overhaul Centre
MIS	Management Information System
MO	Material Organisation (Previously known as NSD-Naval Store Depots)
MoD	Ministry of Defence
MMM	Material Management Manual
MPM	Material Planning Manual
MRH	Multi-Role Helicopter
MRLS	Manufacturer's Recommended List of Spares
MS	Material Superintendent
MSL	Minimum Stock Level
MSS	Mobile Satellite Service
NA	Not Available
NAC	Non Availability Certificate
NBCD	Nuclear, Biological and Chemical Defence
ND	Naval Dockyard
NI	Not INCATed
NLC	Naval Logistics Committee
NMS	New Management Strategy
NR	Non-Russian
NS	Naval Stores
NSD	Naval Stores Depot
OBS	On Board Spares
OEM	Original Equipment Manufacturer
OFB	Ordnance Factory Board
OPV	Offshore Patrol Vessel
OLSAT	Operational Authority Level Safety Audit Team
OST	Operational Sea Training

OTE	Open Tender Enquiry
PAC	Proprietary Article Certificate
PED	Period End Date
PLB	Personal Locator Beacons
PMA	Programme Management Authority
PO	Purchase Order
POER/POEV	Provisioning Officer's Expert Valuation/Review
PPQ	Provisional Procurement Quantity
PQ	Procurement Quantity
RAQAS	Regional Air Quality Assurance Service
RC	Rate Contract
RFP	Request for Proposal
RIO	Raised In office
RITES	M/s Rail India Technical and Economic Services
RPP	Refit Planning Procedure
RS	Russian Stores
RTD	Repair Technical Document
SAR	Search and Rescue
SAT	Sea Acceptance Trials
SDLM	Standard Depot Level Maintenance
SHOPS	Ships Operating Standards
SK, SSK	Store Keeper, Senior Store keeper
SLMS	Ship's Logistics Management System
SNC	Southern Naval Command
SOP	Standard Operating Procedures
SSS	Surplus Serviceable Stores
SSSDC	Serviceable Surplus Stores Disposal Committee
STE	Single Tender Enquiry
TCAS	Traffic Collision Avoidance System
UE	Unit Establishment
USG	United States Government
USL	Upper Stock Level
VED	Vital, Essential, Desirable
WNC	Western Naval Command

## OVERVIEW

The total expenditure of the Defence Services during the year 2015-16 was ₹2,43,534 crore. Of this, the Navy spent ₹35,196 crore while Coast Guard spent ₹3,034 crore, which constituted approximately 14.45 *per cent* and 1.25 *per cent* respectively of the total Defence Expenditure. The major portion of the expenditure of the Navy is capital in nature, constituting almost 56.47 *per cent* of the total expenditure whereas expenditure of Coast Guard was equally distributed between Capital and Revenue Heads amounting to ₹1,517 crore for each.

This report contains major findings arising from the test audit of transactions of the Indian Navy and the Indian Coast Guard. Some of the major findings included in the Report are discussed below.

### **I Performance Audit on the Inventory Management of Naval Stores, Equipment and Spare Parts in Indian Navy**

Material planning has many areas of responsibility, but the most significant ones are provisioning, inventory management and issue management. Good inventory management is vital to reduce inventory carrying cost. Information technology has a vital role to play in provisioning and continuous improvement in this area through automation in the form of Integrated Logistics Management System, an on-line, data linked computer system supporting the Navy's material planning.

The procurement quantity generated by the system based provisioning formula was on the higher side and was projecting quantities equivalent to three to six years' annual consumption requirements due to an algebraic anomaly in the existing formula. Inventory control mechanism in the Indian Navy is deficient to the extent that it was not following the ABC categorisation norms. This impacts the quality of review provisioning and assessment of maximum and minimum stock levels of inventory. Laid down timeline for processing of indents was not adhered to leading to cascading effect in procurement of stores. Items procured under Proprietary Article Certificate and Single Tender Enquiry were significantly more *vis a vis* items procured under Open Tender

Enquiry and Rate Contracts, which led to reduced competition/monopolistic situation. Procurement of obsolete items worth ₹46.92 crore indicated lack of due diligence while making procurement decisions. Average demand compliance at Material Organisations was around 70 per cent. Inventory worth ₹7359.37 crore was held by Material Organisations above the Upper Stock Level resulting in avoidable liability of inventory carrying cost of ₹588.75 crore per annum with corresponding risk of deterioration and obsolescence of the stores held.

*(Chapter-II)*

## **II Accidents of ships and submarines in Indian Navy**

The loss of a ship/submarine adversely affects the operational preparedness of the Navy, as acquisition of new ships/submarines involves procurement/construction process of more than eight to ten years. It is, therefore, imperative that Navy maintains its assets free from accidents during peacetime evolutions. Between 2007-08 and 2015-16, Indian Navy ships and submarines were involved in 38 accidents, primarily attributable to fire/ explosion/ flooding. The Indian Navy since inception, had no institutionalised framework to deal with safety issues. A dedicated organisation for dealing with safety issues was setup by the Indian Navy only in 2014, however, it awaits Government's sanction.

*(Paragraph 3.1)*

## **III Functioning of Marine Gas Turbine Overhaul facility**

INS Eksila is overhauling the M3E Gas Turbines since 1991, but continued to encounter abnormal delays in completion of the overhaul of the Gas Turbines, *inter alia*, due to non-availability of spares and manpower. The facility required for overhaul of M-15 Gas Turbines was yet to be completed though the facility had been planned to be set up since 1986. Meanwhile, two out of twelve 1241 RE class ships, which employ the M-15 Gas Turbines, had been decommissioned by April 2016. Overhaul facility for M-36 Gas Turbines

planned in 2008, has also been delayed for want of synchronisation between civil works and procurement of equipment. Consequently, Navy continued to depend on Original Equipment Manufacturer (OEM) for overhaul of Gas Turbines, incurring an expenditure of ₹317.77 crore. INS Eksila is grappling with inadequate availability of technical expertise, due to non-retention of manpower for long duration.

*(Paragraph 3.2)*

#### **IV Operation and Maintenance of UH-3H helicopters**

The UH-3H fleet of helicopters, procured as an integral part of Landing Platform Deck, was unable to maintain the desired levels of serviceability in six out of seven years of its operations since commissioning despite reduction of the Unit Establishment of the squadron from four to three helicopters. In absence of clear targets, the deck based flying remained significantly low. Non-existence of dedicated depot level maintenance facilities and non-availability of spares adversely impacted the maintenance of the fleet. Further, Navy continues to be dependent on the foreign repair agency for maintenance, servicing and logistics issues due to lack of training of Naval personnel.

*(Paragraph 3.3)*

#### **V Risky exploitation of Sindhughosh class submarines due to delay in installation of periscopes**

Delay of more than 34 months in according approval by the Ministry for amendment to contract for change in ownership of the seller and delivery period extension, required for supply of the periscopes, led to delay in delivery and installation of periscopes for Sindhughosh class submarines. This resulted in risky exploitation of submarines for 22 to 62 months till next refit.

*(Paragraph 3.4)*



**VI Non-installation of a mandatory system compromising the flight safety of aircraft**

Non-availability of a critical flight safety equipment on board the Indian Navy's and Coast Guard's aircraft, has impacted their safe operation for the past 12 years. The situation would persist for another four years due to asynchronous timelines for delivery of the equipment and its installation on board the aircraft. Further, failure to take cognizance of de-induction of one of the aircraft fleet, resulted in excess procurement of ten equipment worth ₹5.58 crore.

*(Paragraph 3.5)*

**VII Fleet tankers rendered vulnerable due to delay in fructification of offset obligation**

Non-availability of the defence systems onboard the fleet tankers, since their delivery in 2011, rendered them vulnerable to external threats. Further, non-linking of payment with the supply/installation of vital defence systems catered for under offset clauses of the contracts for two fleet tankers, resulted in premature payment of ₹26.73 crore to the foreign vendor.

*(Paragraph 3.6)*

**VIII Deficient small arms practice firing by Naval Officers in Delhi Area**

All Indian Navy personnel are required to have working knowledge of handling all types of small arms. It was noticed that the coverage of Naval officers in practise firing was meagre in Delhi Area creating concerns about their ability to handle small arms.

*(Paragraph 3.7)*

**IX Unwarranted procurement of aero-engines for a helicopter fleet**

Indian Navy, while placing the order for procurement of four aero-engines for two helicopters damaged in an accident, did not take into consideration one helicopter which was declared Beyond Economical Repairs before the conclusion of the contract and 16 aero-engines received post-overhaul. Although, these excess engines were absorbed in subsequent procurement of five helicopters, Beyond Economical Repairs declaration of another helicopter resulted in inventory holding of the aero-engines more than its authorisation and unproductive expenditure of ₹16.62 crore on the procurement of three excess aero-engines.

*(Paragraph 3.8)*

**X Avoidable procurement and installation of Mobile Satellite Service Terminal for an aircraft**

Failure of the Indian Navy to take cognizance of the de-induction plan of Tu-142M aircraft fleet, resulted in procurement of an excess Mobile Satellite Service terminal for an aircraft at ₹0.95 crore. Further, de-induction of another three aircraft by 2017 would render installation of Mobile Satellite Service terminals on these aircraft, largely unfruitful.

*(Paragraph 3.9)*

**XI Procurement of weather radars for Dornier aircraft**

Non-supply of a critical component *viz.*, display units, as part of procurement of weather radars impacts the operational exploitation of the Dornier aircraft fleet.

*(Paragraph 3.10)*

**XII Avoidable expenditure on procurement of rice**

In deviation from the existing policy on provisioning and procurement of dry rations, Indian Navy resorted to local purchase of rice for the naval contingent in Delhi Area, thereby, incurring extra expenditure of ₹0.89 crore in procurement of rice.

*(Paragraph 3.11)*

**XIII Irregular payment of ₹5.23 crore as Foreign Exchange Rate Variation to a shipyard**

Indian Coast Guard authorities made a payment of ₹5.23 crore to M/s Goa Shipyard Limited, Goa as Foreign Exchange Rate Variation due to misinterpretation of contractual provisions.

*(Paragraph 4.1)*

## CHAPTER I: INTRODUCTION

### 1.1 Profile of the audited entities

This report relates to matters arising from the audit of financial transactions of the following organisations under the Ministry of Defence:

#### 1.1.1 Indian Navy

The Indian Navy is headed by the Chief of Naval Staff. Integrated Headquarters Ministry of Defence (Navy) is the apex body and chief management organisation responsible for command, control and administration of the Indian Navy. Operational and maintenance units of Indian Navy primarily consist of warships and submarines, dockyards, naval ship repair yards, armament and weapon equipment depots and material organisations. Indian Navy has an Aviation wing with air stations and allied repair facilities under them. Indian Navy also has warship overseeing teams which monitor the construction of ships and submarines at the concerned shipyards.

The objective of the Navy's military role is deterrence/ dissuasion against any intervention or act which is against our National interests, and the ability to inflict a crushing defeat on the adversary in the event of hostilities. Major contributions<sup>1</sup> of the Indian Navy to the nation during the year 2015-16 were:

- Hosting of International Fleet Review (IFR-16) at Visakhapatnam from February 4<sup>th</sup> to 8<sup>th</sup> February 2016.
- Commissioning of Indian Naval Ship (INS) Kochi, the second ship of the Kolkata class guided missile destroyer.
- Commissioning of INS Astradharini, Torpedo Launch Recovery Vessel (TLRV).
- Commissioning of Training Simulator facility to train personnel in operation of MiG 29K aircraft.

---

<sup>1</sup> Source: Government of India, Ministry of Defence Annual Report 2015-16

- Induction of eight P-8I Long Range Maritime Warfare (LRMRASW) aircraft.
- Commissioning of 13 Immediate Support Vessels (ISVs).

### **1.1.2 Indian Coast Guard**

The Indian Coast Guard was created to protect the country's vast coastline and offshore wealth. The Director General, Coast Guard exercises general superintendence, direction and control of the Coast Guard. The Coast Guard has various types of patrol vessels for patrolling the coastline for illegal activities like smuggling, trespassing into Indian Maritime zones, etc. Coast Guard also has an Aviation wing to patrol the coastal areas and carry out Search and Rescue Mission at sea with fixed and rotary wing aircraft. The aviation wing has Coast Guard Air Stations and Air Enclaves for effectively carrying out its duties in all the coastal areas. Major achievements<sup>2</sup> of the Coast Guard during the year 2015-16 were as follows:

- Commissioning of Offshore Patrol Vessel (OPV) viz., Indian Coast Guard Ship (ICGS) Samarth.
- Induction of Pollution Control Vessel (PCV) viz., ICGS Samudra Pavak.
- Commissioning of seven Fast Patrol Vessels (FPVs).
- Commissioning of 11 Interceptor Boats (IBs).

The report also relates to matters arising from the audit of financial transactions of the following organisations under the Ministry of Defence:

- Defence Research and Development Organisation of Ministry of Defence and its laboratories dedicated primarily to Indian Navy.
- Defence Accounts Department dealing with Indian Navy and Indian Coast Guard.
- Military Engineer Services dealing with Indian Navy and Indian Coast Guard.

---

<sup>2</sup> Source: Government of India, Ministry of Defence Annual Report 2015-16

## **1.2 Authority for audit**

Article 149 of the Constitution of India and the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act 1971 and Regulations of Audit and Accounts 2007, give authority for audit and detailed methodology of audit and its reporting.

Office of the Principal Director of Audit, Navy, New Delhi, and its three branch offices at Mumbai, Visakhapatnam and Kochi are responsible for audit of Indian Navy, Indian Coast Guard and other related organisations.

## **1.3 Audit methodology and procedure**

Audit is prioritised through an analysis and evaluation of risks so as to assess their criticality in key operating units. Expenditure incurred, operational significance, past audit results and strength of internal control are amongst the main factors which determine the severity of the risks. An annual audit plan is formulated to conduct audit on the basis of risk assessment.

Audit findings of an audited entity are communicated through Local Test Audit Report/Statement of Cases. The response from the audited entity is considered which may result in either settlement of the audit observation or referral to the next audit cycle for compliance. Serious irregularities are processed as draft paragraphs for inclusion in the Audit Reports which are submitted to the President of India under Article 151 of the Constitution of India, for laying them before each House of Parliament. Performance Audits are done through structured exercise by defining scope of audit, holding entry conference, sampling of units, exit conference, inclusion of feedback on draft report and issuance of final report.

## **1.4 Defence Budget**

The Defence budget is broadly categorised under Revenue and Capital expenditure. While Revenue expenditure includes pay and allowances, stores, transportation and works services, etc., Capital expenditure covers expenditure on acquisition of new ships, submarines, weapons, ammunition and replacement of obsolete stores, construction works, etc. Details of Defence expenditure during 2011-12 to 2015-16 is reflected in the table below:

**Table-1.1: Total Defence Budget allocation and Actual expenditure**

(₹ in crore)

Description	Year				
	2011-12	2012-13	2013-14	2014-15	2015-16
<b>Budget allocation</b>	1,78,891	1,98,526	2,17,649	2,54,000	2,64,142
<b>Actual expenditure</b>	1,75,898	1,87,469	2,09,789	2,37,394	2,43,534

Source: Year-wise Appropriation Accounts of Defence Services

The Defence expenditure in the previous five years registered an increase of 38.45 per cent from ₹1,75,898 crore in 2011-12 to ₹2,43,534 crore in 2015-16. As compared to previous year, the Defence expenditure increased by 2.59 per cent i.e., from ₹2,37,394 crore in 2014-15 to ₹2,43,534 crore in 2015-16. The share of Indian Navy in the total expenditure on Defence Services in 2015-16 was ₹35,196 crore i.e., 14.45 per cent.

### 1.5 Budget and Expenditure of Navy

The summarised position of appropriation and expenditure from 2011-12 to 2015-16 in respect of Indian Navy is reflected in the table below:

**Table-1.2: Appropriation and Expenditure**

(₹ in crore)

Description		Year				
		2011-12	2012-13	2013-14	2014-15	2015-16
<b>Final Grant</b>	<b>Capital</b>	17,922	17,066	19,386	21,807	19,757
	<b>Revenue</b>	12,347	12,755	13,364	14,536	16,126
	<b>Total</b>	<b>30,269</b>	<b>29,821</b>	<b>32,750</b>	<b>36,343</b>	<b>35,883</b>
<b>Actual Expenditure</b>	<b>Capital</b>	19,211	17,760	20,359	22,270	19,875
	<b>Revenue</b>	12,059	12,119	13,472	14,352	15,321
	<b>Total</b>	<b>31,270</b>	<b>29,879</b>	<b>33,831</b>	<b>36,622</b>	<b>35,196</b>
<b>Total Excess/ Savings (+)/(-)</b>	<b>Capital</b>	(+)1,290	(+)694	(+)973	(+)463	(+)118
	<b>Revenue</b>	(-)288	(-)636	(+)108	(-)184	(-)805
	<b>Total</b>	<b>(+)1,002</b>	<b>(+)58</b>	<b>(+)1,081</b>	<b>(+)279</b>	<b>(-)687</b>

Source: Year-wise Appropriation Accounts of Defence Services

An analysis of the Appropriation Accounts, Defence Services for each of the five years had been included in the Report of the Comptroller and Auditor General of India for the relevant years, Union Government– Accounts of the Union Government.

### 1.5.1 Navy Expenditure

A broad summary of expenditure of Indian Navy is given in the table below:

**Table-1.3: Expenditure of Indian Navy**

(₹ in crore)

Description	Year				
	2011-12	2012-13	2013-14	2014-15	2015-16
<b>Total Defence Expenditure</b>	1,75,898	1,87,469	2,09,789	2,37,394	2,43,534
<b>Total Expenditure of Navy</b>	31,270	29,879	33,831	36,622	35,196
<b>Percentage change over previous year</b>	(+)14.61	(-) 4.45	(+)13.23	(+)8.25	(-)3.89
<b>As a percentage of total Defence Expenditure</b>	17.78	15.94	16.13	15.43	14.45
<b>Revenue Expenditure</b>	12,059	12,119	13,472	14,352	15,321
<b>Capital Expenditure</b>	19,211	17,760	20,359	22,270	19,875

Source: Year-wise Appropriation Accounts of Defence Services

The total expenditure incurred by the Indian Navy during 2011-12 to 2015-16 ranged between 14.45 and 17.78 *per cent* of the total Defence expenditure. In the year 2015-16, the expenditure of Indian Navy decreased by 3.89 *per cent* from ₹36,622 crore to ₹35,196 crore as compared to the previous year.

### 1.5.2 Capital Expenditure

The average annual distribution of expenditure over different categories for the last five years (2011-12 to 2015-16) for Indian Navy is depicted in the table below:



**Table-1.4: Capital Expenditure of Indian Navy**

(₹ in crore)

Head	Year				
	2011-12	2012-13	2013-14	2014-15	2015-16
Naval Fleet	10,320 (54%)	11,074 (62%)	8,151 (40%)	13,355 (60%)	10,765 (54%)
Naval Dockyard	648 (3%)	752 (4%)	633 (3%)	635 (3%)	778 (4%)
Aircraft and Aero-Engine	4,336 (23%)	1,695 (10%)	7,746 (38%)	3,248 (15%)	4,183 (21%)
Construction Works	515 (3%)	527 (3%)	516 (3%)	646 (3%)	680 (4%)
Other Equipment <sup>3</sup>	2,583 (13%)	2,773 (16%)	2,630 (13%)	3,654 (16%)	2,656 (13%)
Others	809 (4%)	939 (5%)	683 (3%)	731 (3%)	813 (4%)
<b>Total</b>	<b>19,211</b>	<b>17,760</b>	<b>20,359</b>	<b>22,270</b>	<b>19,875</b>

Source: Year-wise Appropriation Accounts of Defence Services

The Capital expenditure of the Indian Navy rose from ₹19,211 crore to ₹19,875 crore *i.e.*, by 3.46 *per cent* during five-year period from 2011-12 to 2015-16. As compared to previous year, the Capital expenditure of the Indian Navy decreased by 10.75 *per cent i.e.*, from ₹22,270 crore in 2014-15 to ₹19,875 crore in 2015-16. During the year 2015-16, a significant portion (54 *per cent*) of Capital expenditure was incurred on naval fleet, 21 *per cent* and 13 *per cent* was spent on aircraft and aero-engine and other equipment respectively and 4 *per cent* was spent each on naval dockyard, construction works and others.

### 1.5.3 Revenue Expenditure

The distribution of expenditure over different categories of Revenue expenditure for the last five years is depicted below:

<sup>3</sup> Other equipment includes Electrical/Electronics, Weapon, Space and Satellite, Electronic Warfare, etc.

**Table-1.5: Revenue Expenditure of Indian Navy***(₹ in crore)*

Head	Year				
	2011-12	2012-13	2013-14	2014-15	2015-16
Pay and allowances	4,508 (37%)	4,697 (39%)	5,085 (38%)	5,788 (40%)	6,190 (40%)
Stores	4,173 (35%)	3,982 (33%)	4,619 (34%)	4,151 (29%)	4,166 (27%)
Works	763 (6%)	760 (6%)	1,031 (8%)	1,124 (8%)	1,309 (9%)
Transport	353 (3%)	380 (3%)	347 (3%)	355 (3%)	412 (3%)
Repairs & Refits	768 (6%)	654 (5%)	593 (4%)	863 (6%)	776 (5%)
Others	1,494 (12%)	1,646 (14%)	1,797 (13%)	2,071 (14%)	2,468 (16%)
<b>Total</b>	<b>12,059</b>	<b>12,119</b>	<b>13,472</b>	<b>14,352</b>	<b>15,321</b>

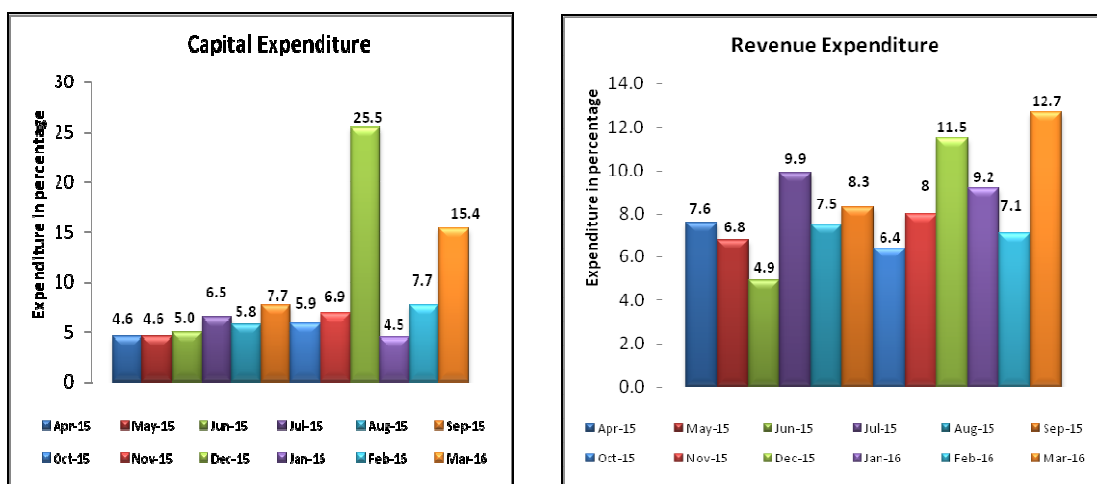
Source: Year-wise Appropriation Accounts of Defence Services

Revenue expenditure of the Indian Navy increased by 27 per cent from ₹12,059 crore to ₹15,321 crore during five-year period from 2011-12 to 2015-16. As compared to previous year, the Revenue expenditure of the Indian Navy increased by 6.75 per cent i.e., from ₹14,352 crore in 2014-15 to ₹15,321 crore in 2015-16. The Revenue expenditure of the Indian Navy was mainly incurred on pay and allowances and stores contributing 40 per cent and 27 per cent respectively.

#### 1.5.4 Pattern of Expenditure of Indian Navy during the year

The pattern of Capital and Revenue expenditure during 2015-16 is indicated below:

**Figure-1.1: Pattern of Expenditure of Indian Navy during 2015-16**



Source: Information provided by Ministry of Defence (Finance) Budget-I Section.

Scrutiny of flow of expenditure revealed that Indian Navy incurred about 15.40 per cent of Capital expenditure in the month of March 2016 and about 27.60 per cent in the last quarter of the financial year, which was within the limit of 15 per cent for the month of March and 33 per cent for the last quarter as prescribed by the Ministry of Finance. The Revenue expenditure of Indian Navy was also within the limits prescribed by Ministry of Finance.

## 1.6 Budget and Expenditure of Coast Guard

Budget of the Coast Guard forms part of the Miscellaneous Grant of the Ministry of Defence. The amount provided for revenue and capital are under the Major Head 2037- 'Customs (Preventive and other functions- Coast Guard Organisation)' and 4047- 'Capital Outlay of Fiscal Services, Customs (Coast Guard Organisation)' respectively. Separate Major heads for Coast Guard expenditure under Ministry of Defence have not been opened.

### 1.6.1 Expenditure of Coast Guard

A broad summary of allotment and expenditure is given in the table below:

**Table-1.6: Expenditure of Coast Guard***(₹ in crore)*

Description		Year				
		2011-12	2012-13	2013-14	2014-15	2015-16
<b>Final Grant/ Appropriation</b>	Capital	1,600	1,565	1,060	1,140	1,500
	Revenue	933	960	1,018	1,295	1,548
	<b>Total</b>	<b>2,533</b>	<b>2,525</b>	<b>2,078</b>	<b>2,435</b>	<b>3,048</b>
<b>Expenditure</b>	Capital	1,575	1,565	1,070	1,142	1,517
	Revenue	926	945	1,048	1,286	1,517
	<b>Total</b>	<b>2,501</b>	<b>2,510</b>	<b>2,118</b>	<b>2,428</b>	<b>3,034</b>

*Source: Information provided by Coast Guard Headquarters*

The total expenditure of Coast Guard ranged between ₹2,118 crore and ₹3,034 crore during the five-year period from 2011-12 to 2015-16. The expenditure increased by 24.96 *per cent* in 2015-16 as compared to the previous year. In absolute terms the expenditure of Coast Guard increased from ₹2,428 crore in 2014-15 to ₹3,034 crore in 2015-16.

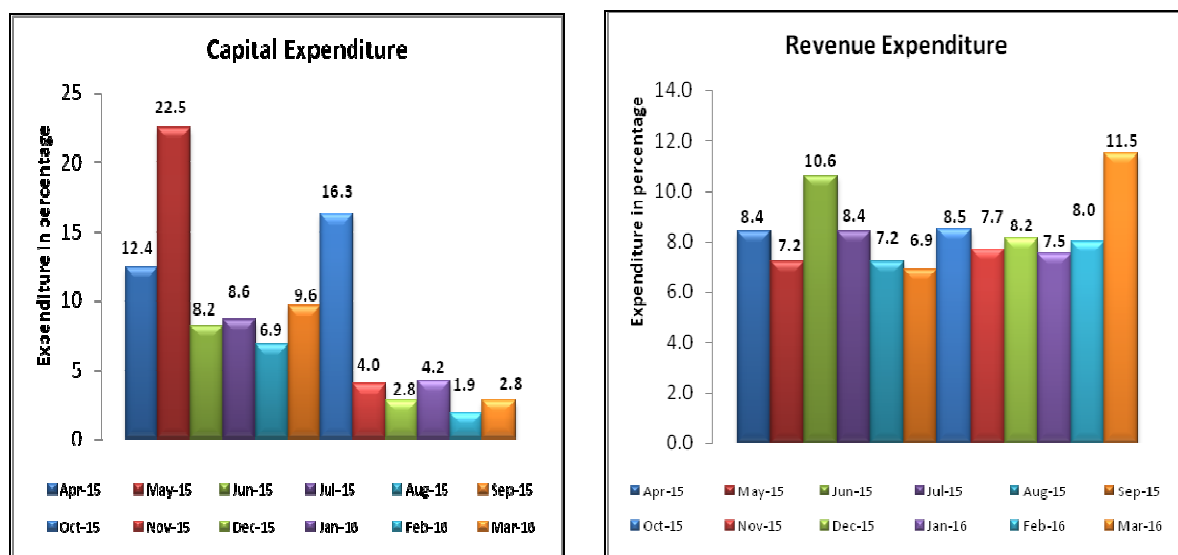
The Capital expenditure of Coast Guard ranged between ₹1,070 crore and ₹1,575 crore during the five-year period from 2011-12 to 2015-16, whereas the Revenue expenditure of Coast Guard has shown an increase of 63.82 *per cent* during the five-year period from 2011-12 to 2015-16 *i.e.*, from ₹926 crore in 2011-12 to ₹1,517 crore in 2015-16.

The Capital expenditure of Coast Guard increased by nearly 32.84 *per cent* from ₹1,142 crore to ₹1,517 crore in the year 2015-16 as compared to the previous year. The Revenue expenditure of Coast Guard increased by nearly 17.96 *per cent* from ₹1,286 crore to ₹1,517 crore in the year 2015-16 as compared to the previous year.

### **1.6.2 Pattern of Expenditure during the year**

Audit examined pattern of Capital and Revenue expenditure during the year 2015-16, which is indicated below:

Figure-1.2: Pattern of Expenditure of Coast Guard during 2015-16



Source: Information provided by Coast Guard Headquarters

Scrutiny of expenditure revealed that Coast Guard incurred about 2.80 per cent of the Capital expenditure in the month of March 2016 and about 8.90 per cent in the last quarter which were within the limit of 15 per cent for the month of March and 33 per cent for the last quarter as prescribed by the Ministry of Finance. The Revenue expenditure was also within the limits prescribed by the Ministry of Finance.

### 1.7 Receipts of the Navy and Coast Guard

The details of receipts and recoveries pertaining to the Indian Navy and Indian Coast Guard during the last five years from 2011-12 to 2015-16 for the services that they provided to other organisations/departments are given in the table below:

Table-1.7: Revenue Receipt of Indian Navy and Coast Guard

Year	₹ in crore)				
	2011-12	2012-13	2013-14	2014-15	2015-16
Receipt and Recoveries in respect of Navy	154.94	285.07	437.89	673.13	328.77
Receipt and Recoveries in respect of Coast Guard	6.73	34.41	27.19	24.60	31.45

Source: Figures of actual receipts as provided by Ministry of Defence (finance) Budget-I and Coast Guard Headquarters

The receipt and recoveries in respect of Navy ranged between ₹154.94 crore and ₹673.13 crore during the five-year period from 2011-12 to 2015-16, whereas the receipt and recoveries in respect of Coast Guard ranged between ₹6.73 crore and ₹34.41 crore during the five-year period from 2011-12 to 2015-16.

The receipt and recoveries in respect of Navy have shown a decrease of 51.16 *per cent* as compared to previous year *i.e.*, from ₹673.13 crore in 2014-15 to ₹328.77 crore in 2015-16, whereas, the receipts and recoveries in respect of Coast Guard have shown an increase of 27.85 *per cent* from the previous year *i.e.*, from ₹24.60 crore in 2014-15 to ₹31.45 crore in 2015-16.

## **1.8 Response to Audit**

### **1.8.1 Action Taken Note on Audit Paragraphs of earlier Reports**

With a view to enforce accountability of the executive in respect of all issues dealt with, in various Audit Reports, the Public Accounts Committee (PAC) desired that Action Taken Notes (ATNs) on all paragraphs pertaining to the Audit Reports for the year ended 31 March 1996 onwards be submitted to them, duly vetted by audit, within four months from the laying of the Report in Parliament.

Status of outstanding ATNs on Audit paragraphs relating to the Indian Navy and Indian Coast Guard as on 31 March 2017 is shown as under:

**Table 1.8: Status of ATN**

<b>Status of ATN</b>	<b>Navy and Coast Guard</b>
Audit Paragraphs/ Reports on which ATNs have not been submitted by the Ministry even for the first time.	1
Audit Paragraphs/ Reports on which revised ATNs are awaited.	36

### **1.8.2 Response of the Ministry to Draft Audit Paragraphs**

The Ministry of Finance (Department of Expenditure) issued directions to all the Ministries in June 1960 to send their response to the Draft Audit Paragraphs proposed for inclusion in the Report of the Comptroller and Auditor General of India within six weeks.

## *Report No. 20 of 2017 (Navy and Coast Guard)*

Draft Performance Audit on “Inventory Management of Naval Stores, Equipment and Spare Parts in Indian Navy” was forwarded to the Secretary, Ministry of Defence through demi-official letter in November 2016. Similarly, 14 Draft Paragraphs were also forwarded between February and December 2016 drawing attention to the audit findings and requesting a response within six weeks.

Despite the instructions of the Ministry of Finance, no replies to eight Paragraphs out of thirteen Paragraphs including the Performance Audit, included in this Report, were received. Thus, the response of the Ministry could not be included in respect of these Paragraphs.

### **1.9 About the Report**

This report contains a Performance Audit and 12 Audit Paragraphs included in four chapters namely:

- Chapter-II containing a Performance Audit on “Inventory Management of Naval Stores, Equipment and Spare Parts in Indian Navy”
- Chapter-III on issues related to Ministry of Defence- Indian Navy containing eleven Audit Paragraphs.
- Chapter-IV on issues related to Ministry of Defence- Indian Coast Guard containing one Audit Paragraph.

## **CHAPTER II: PERFORMANCE AUDIT ON THE INVENTORY MANAGEMENT OF NAVAL STORES, EQUIPMENT AND SPARE PARTS IN INDIAN NAVY**

### **Executive Summary**

#### **2.1 Background**

Indian Navy holds various types of material inventory at different Material Organisations. During the last decade many new platforms have been added to the fleet of Indian Navy. With the expanding fleet, the responsibility of satisfying the demand for the stores increased manifold and accordingly the size of inventory also increased. In order to provide the stores at the right place, time and cost, Indian Navy had to gear up their capability and needed to be equipped with the resources at the Material Organisations. During the last six years Indian Navy had incurred over ₹6,700 crore towards replenishment of their stores. The management of inventory is presently handled by Indian Navy using a fully automated Integrated Logistics Management System (ILMS).

A review on the inventory management in Indian Navy had appeared in the Audit Report No. 8A of 2002. Deficiencies found in the areas of replenishment provisioning, procurement, demand satisfaction, holding and disposal of inventory and inventory automation were mainly commented upon in the report along with suitable recommendations for improvement. The Ministry, in their ATN (April 2006), assured revamping of replenishment provisioning to make procurement procedure more effective, enhancement of demand satisfaction level, speedy disposal of surplus/non-moving inventory, addressing the deficiencies in ILMS and the connectivity of ILMS to all stake holders. Present Performance Audit was carried out with a view to assess the extent of implementation of the recommendations accepted by the Ministry and to assess the economy, efficiency and effectiveness in the provisioning, procurement, demand satisfaction, inventory holding and automation of material management by Indian Navy during the period from 2010-11 to 2015-16.



### **Audit Approach**

Performance Audit (PA) reviewed four Material Organisations (MOs) on the management of the inventory in respect of Naval stores and Equipment and Spare Parts (E&SP) for the period from 2011 to 2016. Audit examination consisted of scrutiny of documents/ records at the various directorates at Integrated Headquarters of Ministry of Defence (Navy) and Material Organisations at Mumbai, Visakhapatnam, Kochi and Karwar. Audit also examined the data derived from ILMS related to various aspects of material management.

### **Key Findings**

#### **(i) Effectiveness of Provisioning Process and Selective Inventory Control Techniques**

The automated system based replenishment provisioning process followed by Indian Navy in its inventory management had not achieved its desired objective of precise estimation of procurement quantities due to inbuilt error in provisioning formula. This had resulted in intervention by Provisioning Officers' Expert Review (POER) in all cases inevitably, defeating the very purpose of automation. Timelines prescribed for processing of indents were not adhered to leading to consequent delays in procurement. There was lack of efficient inventory control mechanism as Indian Navy failed to adhere to laid down norms of ABC categorisation of inventory management. It had consequent impact on review provisioning and assessment of Maximum and Minimum stock levels of inventory. Exercise of POER by professional officers while recommending procurement lacked justification as 21,497 items valuing ₹499 crore procured after intervention of POER were in stock in excess of the prescribed Upper Stock Level.

*(Paragraphs 2.3.1, 2.3.2.2 and 2.3.3)*

#### **(ii) Efficiency and Effectiveness of Procurement**

Percentage of items procured under Proprietary Article Certificate and Single Tender Enquiry was on higher side as compared to items procured under Tender Enquiry and Rate Contract which had led to reduced competition / monopolistic situation. Items worth ₹46.92 crore were procured after being

declared obsolete, indicating lack of due diligence from the material planners while making procurement decisions. There was abnormal delay in approval of indents by provisioning agencies resulting in cascading effect on placement of purchase orders. There was no substantial increase in the registration of new vendors resulting in poor vendor data base.

*(Paragraphs 2.4.2.1, 2.4.2.2 and 2.4.5)*

**(iii) Demand Compliance**

Only 7.65 to 10.13 *per cent* of total demands received from user units were vetted by material planners within laid down time indicating slow progress in vetting by Material Organisations (MOs) with eventual delay in authorisation and issue to users. Average demand compliance at MOs showed a marginal improvement in spite of automation of Naval inventory. The average compliance rate of Refit Planning Programme (RPP) demands in respect of 20 ships undergoing refit at ND Mumbai was below 60 *per cent* which contributed to delay in the scheduled completion of refits and eventual impact on the operational availability of ships.

*(Paragraphs 2.5.1 and 2.5.3)*

**(iv) Inadequacies in Inventory Holding**

Non-moving inventory held in Material Organisations (MOs) ranged between 54 and 98.29 *per cent*. Further, 30 *per cent* of the total inventory were in obsolete/ obsolescent condition. This indicated excess procurement made by MOs constraining the storage space and unhealthy inventory management. Apart from this, inventory worth ₹7,359.37 crore was held by MOs above the upper stock level which resulted in avoidable liability of inventory carrying cost of ₹588.75 crore per annum besides risk of deterioration and obsolescence of the store held. Large number of items in inventory were held at MOs below minimum stock level, thereby, increasing the risk of stock out situation. Several makes of equipment serving the same purpose and different items serving the same function existed in Naval inventory signifying that no efforts for standardisation of common equipment had been made by Indian Navy. This resulted in holding multiple inventories of similar types of equipment leading to issues relating to its provisioning and stocking.

*(Paragraphs 2.6.1, 2.6.2.1, 2.6.3 and 2.6.7)*

**(v) Effectiveness of ILMS**

There existed lack of adequate control mechanism for ensuring correctness and validation of data at data entry level. Existence of multiple vendor codes in the system caused hindrance to rationalisation of Naval inventory. Resources available in the ILMS were not optimally utilised which resulted in avoidable procurement of stores. Integration of ILMS with all stake holders such as MOs, Naval Dockyards, Technical Directorates at IHQ MoD (Navy), Indian Naval Ship Maintenance Authority, Warship Overseeing Teams and user units was not yet achieved resulting in lack of continuous flow of information and total asset visibility at all levels.

*(Paragraphs 2.7.2, 2.7.4 and 2.7.5)*

**Recommendations**

- ✓ *The provisioning formula adopted by Indian Navy requires modification to ensure more accurate projection of procurement quantity and less manual intervention.*
- ✓ *The high percentage of procurement made by MOs outside ARP should be discouraged and efforts should be made to bring all the procurements within ARP.*
- ✓ *Activities related to provisioning and management of inventory need to be streamlined by adopting effective classification of inventory in terms of their consumption and criticality to accomplish selective inventory controls as envisaged in Material Planning Manual.*
- ✓ *The Annual Consumption Limits and the existing values for A, B and C category of stores need a revision as the present limits were laid down in MPM-1995.*
- ✓ *Procurement activities need to be streamlined to ensure lesser internal lead time and healthy competition.*
- ✓ *While initiating procurement action, mechanism should be in place to ensure that no obsolete items are procured.*

- ✓ *Vendor management needs to be strengthened to increase the vendor base. Action needs to be taken to ensure that vendor registration is done locally by all the MOs in order to encourage competition. Multiple registrations of same vendors be avoided by allocating a unique vendor code.*
- ✓ *Timelines for various stages of demand compliance need to be laid down and to be strictly adhered to.*
- ✓ *Replenishment provisioning needs to be suitably streamlined to avoid over procurement of stores resulting in inflated inventory.*
- ✓ *Minimum stock levels of 'Vital' and 'Essential' items are to be maintained to avoid their stock out situation.*
- ✓ *Suitable controls/validations at all levels need to be incorporated into ILMS to ensure availability of correct data for better decision making.*

## **Introduction**

**2.2** Successful military logistics world over have one aspect in common 'precise inventory and its effective management'. Whether it is scheduled routine or breakdown maintenance, inventory management system should be resilient enough to pool in required spares in a reasonable time to minimise the platform downtime. This needs a concise inventory and a management system that is supported by well-designed forecasting review and provisioning system.

### **Types of Inventory**

Indian Navy (IN) handles various types of inventory viz., Naval stores<sup>1</sup>, Equipment and Spare Parts (E&SP)<sup>2</sup>, fuel and lubricants, clothing and victualling stores, medical stores, armament stores, weapon equipment and spare parts. Weapons and armament stores are stocked at Weapon Equipment

---

<sup>1</sup> Naval Stores- Naval stores include all stores used in the Indian Navy except those specifically listed in Para 2.2. Following are some of the important constituents of Naval stores: Yard materials, Hull and ship fittings, Portable fittings, Office equipment and stationery, Boats and boat stores, Diving stores, Hydrographic and Oceanographic stores, Meteorological and Oceanological stores.

<sup>2</sup> Equipment & Spare Parts (E&SP)- These include all equipment and spare parts manufactured or assembled in India, including those fitted on ships built indigenously and abroad and held in stock. Spare parts connote assemblies, sub-assemblies and components of equipment, excluding those components stocked as Naval stores.

Depots (WEDs) and Naval Armament Depots (NADs). The Naval stores and E&SP which are stocked and supplied by Material Organisations (MOs) were focus area of audit examination.

### **Inventory Management Philosophy**

Inventory management and logistics planning of Indian Navy commence with a review of Naval inventory based on demands from the ships and establishments, forecast from Naval dockyards and requirements raised by directorates at IHQ MoD (Navy). This forms the basis for planning and raising of indents for the procurement of Naval stores, equipment and spare parts. Downtime of ships considerably affects force levels in the Indian Navy. Material support, thus, has the responsibility of ensuring force levels through a well sustained inventory management system that will minimise downtime during peace operations and result in efficient maintenance cycles. As 'stock outs' seriously impair capability, demand satisfaction level is an important criterion. At the same time, ships/submarines by itself constitute a major platform and non-availability of any store may cause downtime of many months which has serious implications.

### **Material Organisation**

All Naval stores and E&SPs are stocked and supplied by MOs earlier known as Naval Stores Depots (NSD) at each Naval command *i.e.*, Western Naval Command, Mumbai {MO (MB)}<sup>3</sup>, Eastern Naval Command, Visakhapatnam {MO (V)}, Southern Naval Command, Kochi {MO (K)}. In addition, there are MOs located at Karwar {MO (KW)} and Port Blair {MO (PB)}<sup>4</sup> to cater to requirements of Indian Navy ships/submarines and shore establishments.

### **Organisational Structure and store provisioning**

At Integrated Headquarters Ministry of Defence (Navy) {IHQ MoD (Navy)}, the Material Branch of Indian Navy is headed by the Chief of Materiel (COM). The Controller of Logistics (COL) in the rank of Vice Admiral functioning under COM is responsible for logistics management in the Indian Navy excluding air stores and weapons equipment, which are managed by

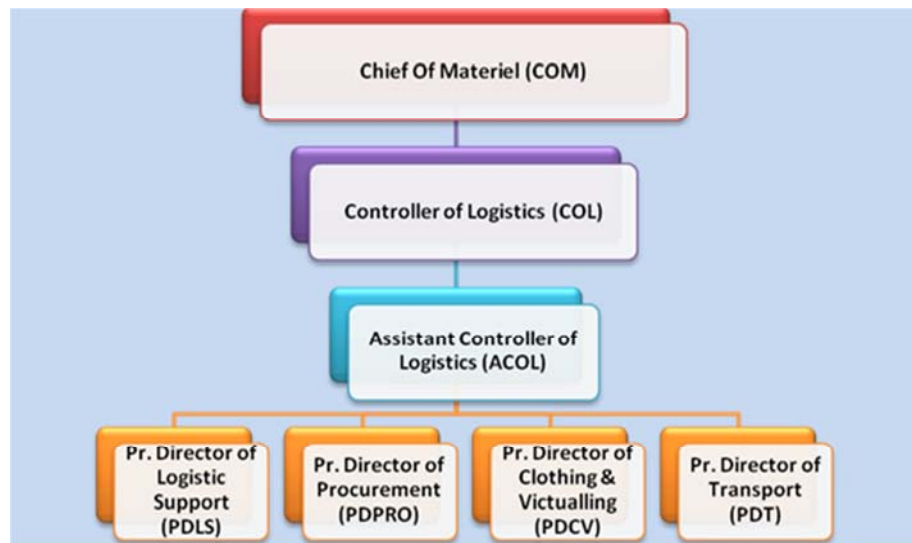
---

<sup>3</sup> MO (MB)- Material Organisation, Mumbai                      MO (K)- Material Organisation, Kochi  
MO (V)- Material Organisation, Vishakhapatnam      MO (KW)- Material Organisation, Karwar  
<sup>4</sup> MO (PB)- A satellite Material Organisation at Port Blair stocks Naval Stores.

Directorate of Aircraft Logistics Support (DALIS) under ACNS (Air Materiel) and Directorate of Weapon Equipment (DWE).

The COL is assisted by an Assistant Controller of Logistics (ACOL) in the rank of Rear Admiral, as indicated in the figure below:

**Figure 2.1: Organisational Structure at IHQ MoD (Navy)**

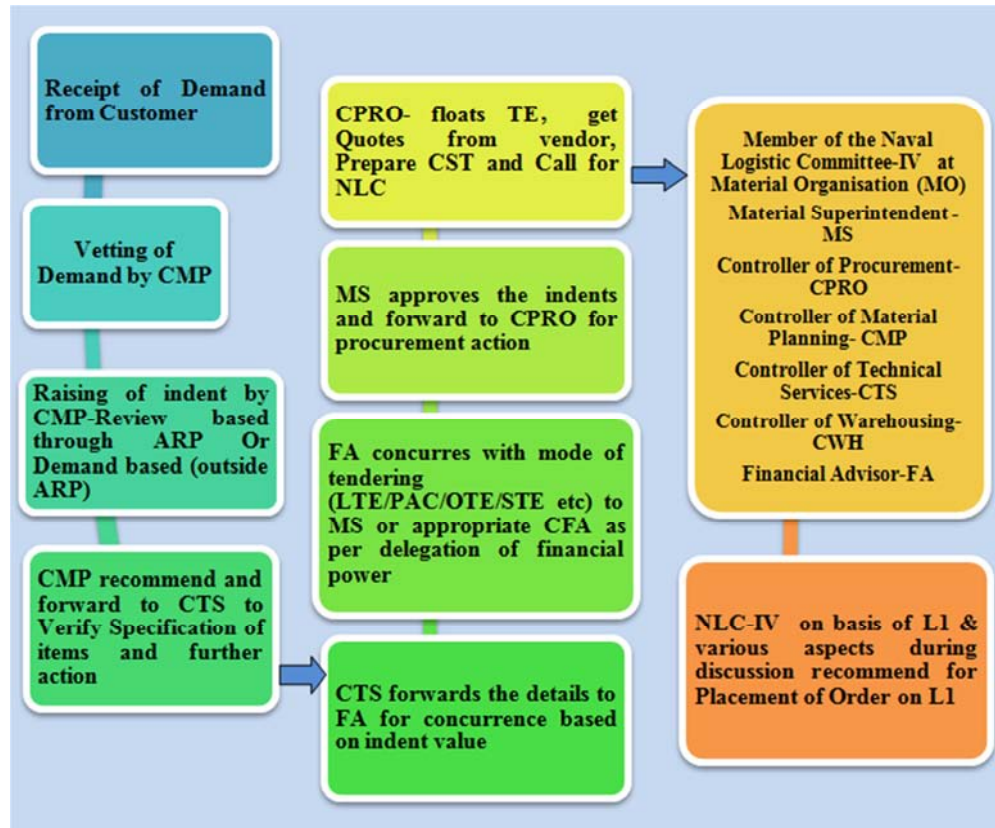


At Command Headquarters, the MOs are headed by Material Superintendents (MS) and are assisted by four Controller *viz.*, (i) Controller of Materiel Planning (CMP), responsible for overall materiel planning based on the automatic replenishment and demand from the users; (ii) Controller of Procurement (CPRO), responsible for procurement activities; (iii) Controller of Warehousing (CWH), is the stockist of all the inventories procured and is also responsible for receipt and issue to the users; and (iv) Controller of Technical Services (CTS), looks into the technical aspects *viz.*, specifications of items and repair of inventory. In addition, a System Administrator (SA), responsible for all aspects related to computerised inventory *i.e.*, Integrated Logistics Management System (ILMS) is posted in some MOs.

Stores provisioning entails working out of the requirement based on the demands and projecting it to various authorities for procurement action. The

flow chart relating to the process of provisioning and procurement finalisation by Naval Logistics Committee<sup>5</sup> is as follows:

**Figure 2.2: Provisioning and Procurement Process Flow Chart**

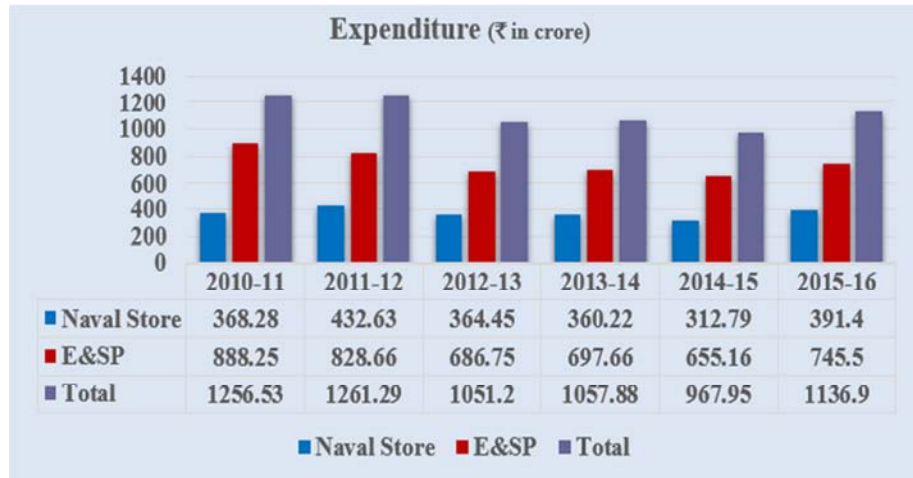


### Financial Status

Total expenditure of ₹6,731.75 crore was incurred by Indian Navy under the Minor Head 110-Stores for the procurement of Naval Stores (NS) and Equipment and Spare Parts (E&SP) during the period from 2010-11 to 2015-16 as given below:

<sup>5</sup> Naval Logistics Committee- The chairmen of NLCs are Controller of Logistics (COL) for Level 1, ACOLOG for Level 2, CLOGO/CSO (P&A) at Command Level for Level 3 and Material Superintendent (MS) at Material Organisation for Level 4. The members of NLCs are: Financial Advisor (FA), Procurer (DPRO/CPRO), Technical member (CTS) and Indentor (CMP). The chairman takes procurement decisions normally with the concurrence of the members of the NLC. However, in case of difference of opinion between the Chairman and other members of the NLCs, the decision of the Chairman is final.

Figure 2.3: Expenditure Details



Source: Information provided by DLS/IHQ MoD (Navy)

### Audit objectives

The Performance Audit was taken up with the following audit objectives:

- Whether the remedial action agreed in the Ministry's Action Taken Notes (ATNs) (April 2006) on the Audit Report No. 8A of 2002 have been implemented in so far as the scope covered in the current audit?
- Whether the procedures for provisioning of spares have been streamlined?
- Whether the existing procurement procedure is effective?
- Whether the demand satisfaction level is optimum?
- Whether management of inventory holding is satisfactory?
- To assess the adequacy of the Integrated Logistics Management System (ILMS).

### Scope of Audit

The present Performance Audit (PA) covered the period 2010-11 to 2015-16 on management of inventory related to Naval stores, Equipment and Spare Parts with focus on the provisioning under revenue procurement. An audit review on the Inventory Management of Indian Navy was included in the CAG's Audit Report No. 8A of 2002. The status of recommendations made in the ATN on Report No. 8A of 2002 have been covered in the present PA. All MOs, except MO (PB), being newly created, were selected for audit.



The Directorate of Logistics Support (DLS) and Directorate of Procurement (DPRO) at IHQ MoD (Navy) involved in the planning and procurement of Naval inventory were also selected.

**Audit Criteria**

- The Ministry's ATN (April 2006) on the Audit Report No. 8A of 2002.
- Orders/guidelines on provisioning, procurement and holding of Naval stores/equipment.
- Defence Procurement Manual (DPM)-2009 and relevant Defence Procurement Procedures (DPPs).
- Material Planning Manual (MPM)-1995.
- Integrated Logistics Management System Manual.
- Material Management Manual and Procurement Manual.
- The Navy Instruction- NI 1/S/2006.
- Guidelines on Ranging and Scaling of Base & Depot (B&D) spares-2005, (INBR-622)
- Confidential Navy Order on Ops-cum-Refit cycles of Indian Navy ships and submarines
- INBR-12 (Naval Stores)

**Audit Methodology**

An Entry conference was held on 10 July 2015 with officials of the Ministry of Defence (MoD) and IHQ MoD (Navy). The scope, objectives and methodology of audit was discussed and criteria were agreed upon.

The introduction of the automated management of inventory *i.e.*, Integrated Logistics Management System (ILMS) at all MOs was examined in detail with reference to data on total inventory/stock position, purchase orders, indents raised, annual reviews and demand compliance. Apart from this, a direct access to the front window of ILMS was also provided to the audit team for examination and verification. The data was analysed using Computer Assisted

Audit Techniques (CAATs) viz., MS Excel, IDEA and Tableau<sup>6</sup> for arriving at audit conclusions.

Field audit was carried out in the MOs between June 2015 and October 2016 to evaluate the performance against the audit criteria by way of examination of records, collection of information through issue of audit memos and questionnaires. Audit also analysed data extracted from the computerised packages used at the MOs. The Ministry's reply as well as the Exit Conference was still pending (March 2017).

### **Acknowledgement**

We acknowledge the support extended by Integrated Headquarters of Ministry of Defence (Navy), Material Organisations at Mumbai, Visakhapatnam, Kochi and Karwar in furnishing the requisite documents, information and replies to the Audit queries raised during the course of the Performance Audit.

## **Audit Findings**

### **2.3 Provisioning**

The term 'Provisioning' in the Naval material management context, stands for the authorisation to acquire an item through indenting; Initial Provisioning is a process aimed at catering to the needs of ships On Board Spares (OBS) and Base and Depot (B&D) spares (for five years) at the time of commissioning, which are basically covered under capital procurement. Replenishment provisioning is a process for determining requirements for the ships and establishments on a year-to-year basis to maintain three years' average consumption as stock. Audit focused on the Replenishment Provisioning dealt under the revenue procurement.

Under the Replenishment Provisioning, a review process of Naval inventory on annual basis, as per approved Annual Review Programme (ARP), is initiated, taking into account various parameters such as stock available, Dues-in<sup>7</sup>, Dues-out<sup>8</sup>, Annual Consumption Level (ACL), Consumption

---

<sup>6</sup> MS Excel-Microsoft Excel for data analysis;

IDEA-Interactive Data Extraction and Analysis used as Audit tool;

Tableau- An advanced tool used for better graphical representation of data analysis

<sup>7</sup> Dues-in: Expected supplies against earlier purchase orders.

<sup>8</sup> Dues-out: Pending demands from customer/users yet to materialise.

Forecast, criticality of the item, value of the item, Lead Time<sup>9</sup> and shelf life, while arriving at Procurement Quantity (PQ) of any given item. After the review is processed on system, the requirements are finalised and the Provisioning Officer (PO) raises a request for procurement called “Indent”. The policy for system based reviews is promulgated by DLS, IHQ MoD (Navy) in the form of Annual Review Programme (ARP).

### **2.3.1 Analysis of Provisioning formula**

In Replenishment Provisioning, the determination of requirement is carried out through an automated formula based process, *i.e.*, through ILMS. Thereafter, additions or subtractions are made based on the Provisioning Officer’s Expert Reviews (POER) on how the future consumption is likely to differ from past consumption. The formula for working out the requirement as Provisional Procurement Quantity (PPQ) and Final Procurement Quantity (FPQ) is explained in Annexure-I.

Audit observed that the procurement quantity generated by the system based provisioning formula was on the higher side and was projecting quantities equivalent to three to six years’ annual consumption requirements due to an algebraic anomaly in the existing formula as explained in Annexure-II.

Thus, instead of maintaining the levels of stock between minimum and upper stock, the system generated excess procurement quantities in contravention to the provisions of Material Planning Manual-1995, which stipulates that FPQ should not normally exceed three years’ annual consumption except in exceptional cases where provisioning officers have to record reasons for catering to more than three years’ annual consumption requirements.

Modification of PPQ to FPQ by adding or subtracting POER is a deliberate step which must be recorded by the Provisioning Officer using the relevant codes *i.e.*, R, F, N, O<sup>10</sup> wherein POERs enhance the quantities using codes- R, F and N while only code- O has been provided to reduce the quantity. Any other type of reduction in PPQ by the Planning Officers is not authorised as

---

<sup>9</sup> Lead time represents the estimated average period, in months, which elapses between the date of placing of demand by the provisioning authority and the physical receipt of stores in the consignee establishment.

<sup>10</sup> R-Refit Forecast that is considered reasonable, F-scheduled future routines, N-New items and O-Obsolescence anticipation

per Material Planning Manual (MPM)-1995. Audit observed that POERs were exercising a large degree of manual intervention to reduce the system generated PPQ to arrive at FPQ as enumerated in succeeding para.

MPM-1995 provides that  $FPQ = PPQ + POER$ , where POER is applied by EV and EV Consolidator<sup>11</sup>. EV is the evaluation code for enhancing or reducing the PPQ. Thus, addition/deletion in PPQ is being carried out by POER in two stages; at first stage the quantity EV is enhanced or reduced by the PO, *i.e.*, the Controller of Material Planning (CMP) at MOs and thereafter at the second stage, change made is put up to the CFA for final approval *i.e.*, MS at MOs or Director of Logistics Support (DLS), IHQ MoD (Navy).

Audit analysed (September 2015/January 2016) one review from each MOs and it was noticed that PPQs were either reduced or enhanced at first and second stages by applying EV and EV Consolidator as explained in Annexure-III.

The data of review carried out on ILMS for replenishment provisioning during the calendar years 2009 to 2014<sup>12</sup> was analysed in Audit and the summary of percentage of culmination of PPQ in FPQ (inventory type-wise) is tabulated below:

**Table 2.1: Summary of culmination of PPQ into FPQ**

Name of MO	Range of percentage of PPQ culminated into FPQ		
	Naval Stores (NS)	E&SP <sup>13</sup> (Non-Russian)	E&SP (Russian)
MO (MB)	3.43 to 48.40	4.85 to 25.44	0.39 to 42.60
MO (V)	1.13 to 30.37	6.83 to 23.67	0.22 to 34.32
MO (K)	0.02 to 36.11	2.52 to 28.71	Nil
MO (KW)	5.80 to 80.21	5.63 to 51.47	Nil

*Source: ILMS data provided by IHQ MoD (Navy)*

Lower percentage of culmination of system generated PPQ into FPQ, as evident from the table above, indicates that the ILMS based on Annual

<sup>11</sup> Expert Valuer (EV), in this case is Controller of Material Planning (CMP)  
EV Consolidator- the Competent Financial Authority (CFA) in this case is Material Superintendent (MS) at MO and DLS, IHQ MoD (Navy), who consolidate the final provisioning requirements.

<sup>12</sup> The reviews carried out in a year take time for materialisation. With this consideration, the ARPs *vis à vis* the years 2009-10 to 2014-15 were reviewed so as to reconcile with the period covered in this PA.

<sup>13</sup> E&SP- Equipment and Spare Parts

Review Programmes (ARPs) were not serving as an effective tool for accurate estimation of provisioning requirements and effectiveness of automatic Replenishment Provisioning system was unsatisfactory.

Automated system based replenishment provisioning process which was liable to generate more precise requirements of procurement, warranting minimum intervention of POERs, had not achieved its desired purpose due to inbuilt error in provisioning formula which works out to three to six years' annual requirements, thereby making the intervention by POER in all cases inevitable and hence defeating the very purpose of computerisation and automation. Further, in absence of guidelines/lack of any policy for full manual intervention, no accountability of the PO could be fixed and the data generated in ILMS is on the conscious call of POERs.

In response to the audit findings, IHQ MoD (Navy) accepted (September 2016) the high degree of manual intervention/existence of error in the present PQ formula and agreed for revision of the existing provisioning formula. Hence, provisions of MPM-1995 needs a fresh look and amendments thereof.

### **2.3.2 Replenishment Provisioning through Annual Review Programme**

Annual Review Programme (ARP) is the mainstay of the replenishment provisioning. In order to establish its effectiveness and efficiency, Audit examined the quantum of procurement made within and outside ARP and the time taken to translate reviewed items into indents. Details are discussed in the succeeding paragraphs.

#### **2.3.2.1 Procurement within and outside the ARP<sup>14</sup>**

Procurement outside ARP are carried out by MOs/IHQ MoD (Navy) by raising indents based on specific demands received from customers, B-Form<sup>15</sup> and forecast based demands.

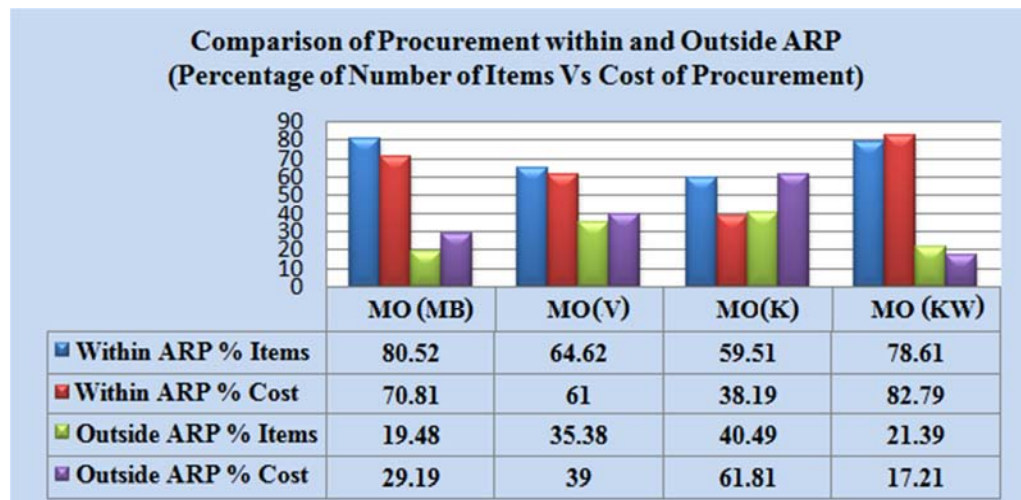
---

<sup>14</sup> This para needs to be read in conjunction with the excess inventory held above USL at MOs (Para 2.6.2.1) as Audit had restricted access to the ILMS system to ascertain the linkage between excess inventory held *vis à vis* quantum of procurement made outside ARP.

<sup>15</sup> B-Form are initiated by professional directorates for procurement of equipment and spare parts.

Audit, in its Report of 2002 had commented on the appreciable procurement being made outside the ARP, wherein quantum of procurement (*i.e.*, volume of items) outside ARP for MO (MB) and MO (V) was 44 *per cent* and 28 *per cent* respectively during the period 1998-99 to 2000-01. In response, Indian Navy had then stated that as a result of progressive data refinement on the ILMS, steps have been taken to reduce procurements outside the ARP. However, ATN of Ministry (2006) was silent on the issue. Audit analysed (December 2015/November 2016) the quantum of procurement (*i.e.*, volume and cost of items) within and outside ARP by MOs from 2010-11 to 2015-16 as enumerated below:

**Figure-2.4: Comparison of procurement within and outside ARP**



*Source: ILMS data provided by IHQ MoD (Navy)*

A comparison of data in Figure-2.4 *vis à vis* the Audit Report of 2002 reveals that MO (MB) had reduced (19.48 *per cent*) procurement outside ARP, whereas MO (V) had contrarily increased (35.38 *per cent*). Further, procurement outside ARP by MO (K) was higher (40.49 *per cent*) whereas the performance of MO (KW) was relatively better (21.39 *per cent*).

While agreeing to the Audit findings, MO (MB) stated (December 2016) that general/low cost items were procured on the basis of review/ACL/MSL<sup>16</sup> quantity. However, high value items are procured against demand and hence

<sup>16</sup> ACL- Annual Consumption Limit; MSL-Minimum Stock Level below which the stock of an item should not fall.

percentage cost of procurements outside ARP is high. MO (K) accepted the audit findings and stated (January 2016) that high value nature items are provisioned to materialise the existing Dues-out and to maintain the ACL/MSL. Further, MO (K) undertook ad hoc procurements outside review like ABER<sup>17</sup>, FCL, critical spares as directed by administrative authorities and provisioned against demand based indents outside ARP which cannot be performed within the ARP. As these items are generally of high value nature, they constitute for 64.50 *per cent* of total procurement cost. However, the fact remains that the trend adopted by the MO (K) to procure the items outside ARP is not a healthy practice.

The replies of other two MOs were awaited (March 2017).

### **2.3.2.2 Time taken for completion of indenting**

ARP calendar lays down specific timeline of one month for completion of indenting from date of consolidation. Considering the size of the Naval inventory, the reviews are undertaken in groups, in a staggered manner, with prescribed frequency. As per ARP calendar, four reviews for Naval Stores, two reviews for Non-Russian Stores (NR) and one review for Russian Stores (RS) with some exception for additional special reviews are carried out on ILMS system every year along with the date of completion for consolidation and indenting of the items reviewed under ARP.

Audit analysed (July 2016) the Annual Review Calendar promulgated by DLS/ IHQ MoD (Navy) for review of Naval inventory on ILMS, in the form of ARP *vis à vis* its actual implementation furnished by the MOs. The details are as discussed below:

- **MO (KW):** Though the ARP calendar stipulates 30 days, the time taken for raising of indent ranged from 3 to 18 months.
- **MO (MB):** There was a delay of more than two months in each case with respect to the timelines laid down in ARP.

Thus, timelines prescribed in the ARP for raising of indents were not adhered to, leading to consequent delays in procurement. In respect of MO (V) and MO (K), response was awaited (March 2017).

---

<sup>17</sup> ABER-Anticipated Beyond Economical Repairs.

### 2.3.3 Enhancement of procurement quantity in excess of requirement

As per provisions contained in MPM-1995, POER is a deliberate step to be exercised by the Provisioning Officer (PO) to change the PPQ and change must be recorded by POER using the specific evaluation code (EV code) in an indent.

Audit observed (September 2015 to January 2016)<sup>18</sup> that items valuing ₹499.19 crore were procured by MOs after enhancement of PPQ by adding POER and these items were held in stock in excess of USL. Out of these, items valuing ₹184 crore were procured after adding POER without recording specific EV codes as detailed in Table-2.2 below:

**Table-2.2: Enhancement of procurement quantity by POERs**

Name of MO	Items procured from 01 April 10 to 31 March 16 and lying in stock in excess of USL as on November 2016		Procurements made against Reviews carried out from 2010-11 to 2014-15 <sup>19</sup> after adding POER and lying in stock in excess of USL (November 2016)		Out of Column 4, procurement made after adding POER without indicating EV code and held in stock in excess of USL	
	No. of items	Value (₹ in crore)	No. of items	Value (₹ in crore)	No. of items	Value (₹ in crore)
1	2	3	4	5	6	7
MO (MB)	28,091	1,221.84	9,350	348.23	1,049	65.97
MO (V)	34,907	3,041.34	5,793	95.25	892	10.33
MO (K)	11,052	99.24	1,752	13.77	4,575	79.74
MO (KW)	10,309	118.35	4,602	41.94	2,595	27.97
<b>Total</b>	<b>84,359</b>	<b>4,480.76</b>	<b>21,497</b>	<b>499.19</b>	<b>9,111</b>	<b>184.00</b>

Source: ILMS data provided IHQ MoD (Navy)

In response to the audit observation, MO (K) stated (November 2015) that EV code was recorded wherever possible. MO (KW) stated (December 2015) that EV codes were used only for E&SP and their use for Naval stores was not completely applicable. Contention of MOs is not tenable since as per IHQ MoD (Navy)'s directives issued in February 2001, it is mandatory to exercise EV codes whenever there is a change in PPQ made through professional evaluation, moreover, EV codes are also to be exercised in respect of Naval stores as per MPM-1995. At MO (MB) modification of PPQ to FPQ was done

<sup>18</sup> Procurement details updated up to 31 March 2016 and stock position updated as on November 2016 after the issue of audit observation.

<sup>19</sup> Cases of Reviews carried out during 2015-16 not taken into account as their indenting and provisioning requires time therefore being at premature stage to comment upon.



(August 2016) by professional officer and where EV codes were not mentioned, remarks had been updated in 'Remark Local Field' in ILMS. The reply is not tenable being in deviation from the laid down procedure.

The procurement of items by applying POER lacks justification since 21,497 items were still lying in stock (November 2016) in excess of USL. Further, in violation of the laid down norms, no EV code was indicated in respect of inventory worth ₹184 crore which were held in stock.

#### **2.3.4 Lack of selective Inventory Control Mechanism**

The classification of Naval inventory into ABC/VED category forms the basis for provisioning and procurement. ABC is a system of inventory classification based on annual consumption whereas VED is a system of inventory classification based on criticality of items *i.e.*, Vital (V), Essential (E) and Desirable (D). ABC analysis (Selective Inventory Control) is an inventory categorisation technique for identifying stock that requires stringent control on high value items thereby impacting overall inventory cost. In inventory analysis, the criteria which make a significant level of control important for any item is based on two factors (i) usage rate *i.e.*, Annual Consumption Limit and (ii) unit value. These two factors can be multiplied to give total Annual Consumption Value.

The classification of ABC in Naval inventory as per MPM-1995 is as under:

- A- annual consumption value above ₹5 lakh;
- B- annual consumption value between ₹0.5 lakh and ₹5 lakh; and
- C- annual consumption value below ₹0.5 lakh

##### **2.3.4.1 Non-revision of ABC classification**

Audit analysed (September 2015/August 2016) serviceable moving inventory where last purchase prices as well as the three years' average consumption value were available across the MOs. The details of ABC categorisation of inventory at MOs are given in Annexure-IV. The summary of items not falling in their respective ABC category and breaching into other categories based on

annual consumption, as per norms laid down in MPM-1995, is given in the Table-2.3 below:

**Table-2.3: Status of ABC categorisation of Naval inventory**

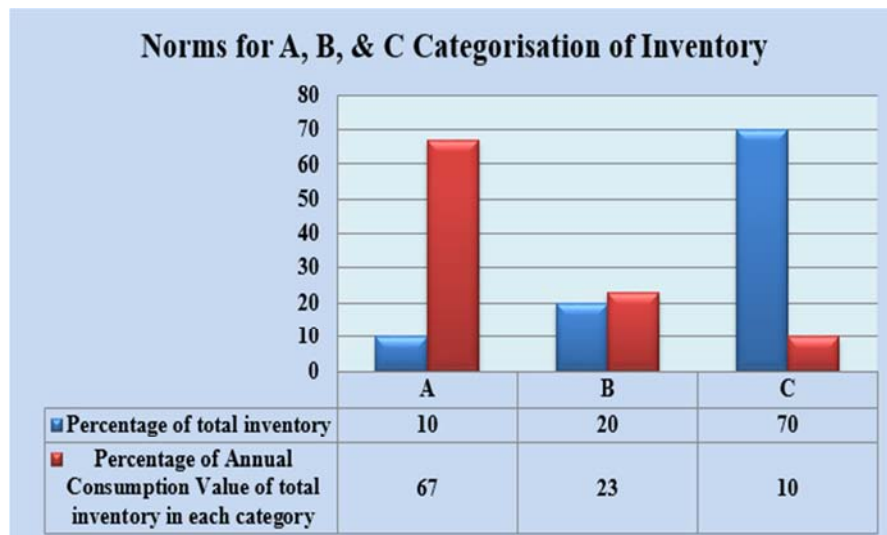
MO	No. of Cat A items breaching into other categories		No. of Cat B items breaching into other categories		No. of Cat C items breaching into other categories	
	Cat B	Cat C	Cat A	Cat C	Cat A	Cat B
MO (MB)	1,087	1,188	195	4,708	1,531	5,784
MO (V)	650	983	482	7,195	3,009	9,482
MO (K)	304	333	32	1,565	369	1,821
MO (KW)	400	973	218	1,928	406	2,301

Source: ILMS data provided by IHQ MoD (Navy)

Above Table-2.3 reveals that items which should have been in category A are spread out in category B and C and *vice versa*. This is indicative of the fact that a dynamic review of categorisation of inventory into A, B and C categories was not as per the laid down norms and, therefore, depicts an incorrect portrait of the inventory holding.

Further, IHQ MoD (Navy) issued (July 2010/January 2011) guidelines for classifying the items into A, B and C categories in terms of percentage of total inventory *vis à vis* the Annual Consumption Value.

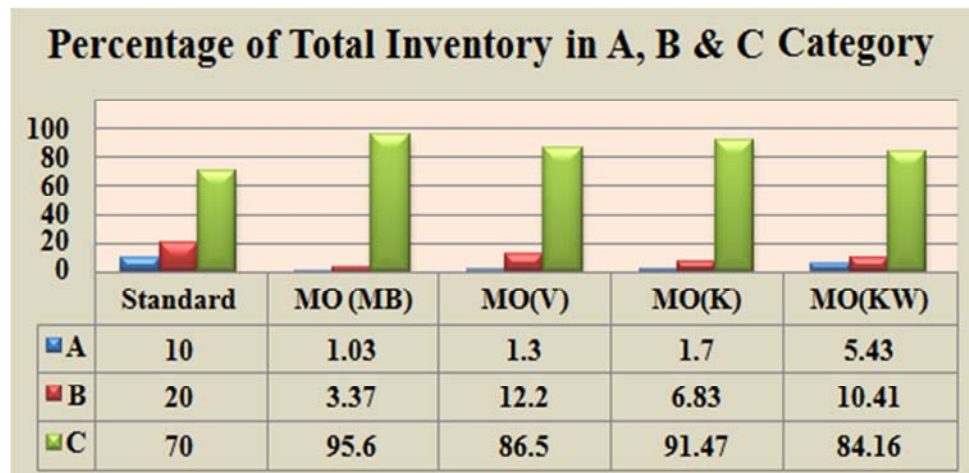
**Figure-2.5: Norms of ABC categorisation**



Source: Information provided by IHQ MoD (Navy)

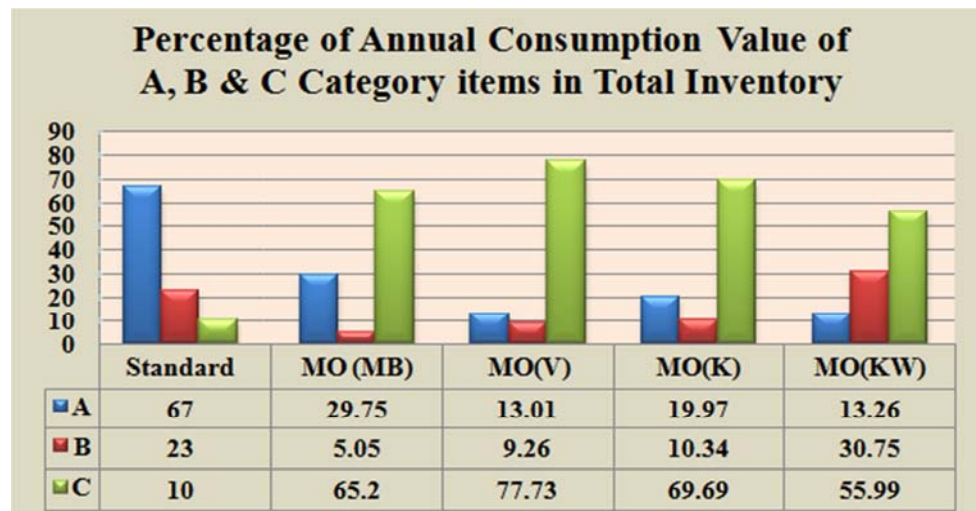
An analysis (August 2016) of the total inventory held in A, B and C categories against the prescribed norms is given in Annexure-V and the same is summarised below:

**Figure-2.6: Percentage of total inventory in ABC category as on 31 July 2016**



Source: ILMS data provided by IHQ MoD (Navy)

**Figure-2.7: Percentage of annual consumption in ABC category from August 2015 to August 2016**



Source: ILMS data provided by IHQ MoD (Navy)

The above facts indicate that in MOs, the laid down percentage of holding of items in A, B and C categories with reference to the total serviceable inventory *vis à vis* the annual consumption value was not adhered to and it showed abnormal pattern of ABC categorisation.

Thus, there was lack of selective inventory control mechanism impacting other aspects of inventory control viz., PPQ through review provisioning, Minimum Stock Level (MSL) and Upper Stock Level (USL) as referred in Annexure-I.

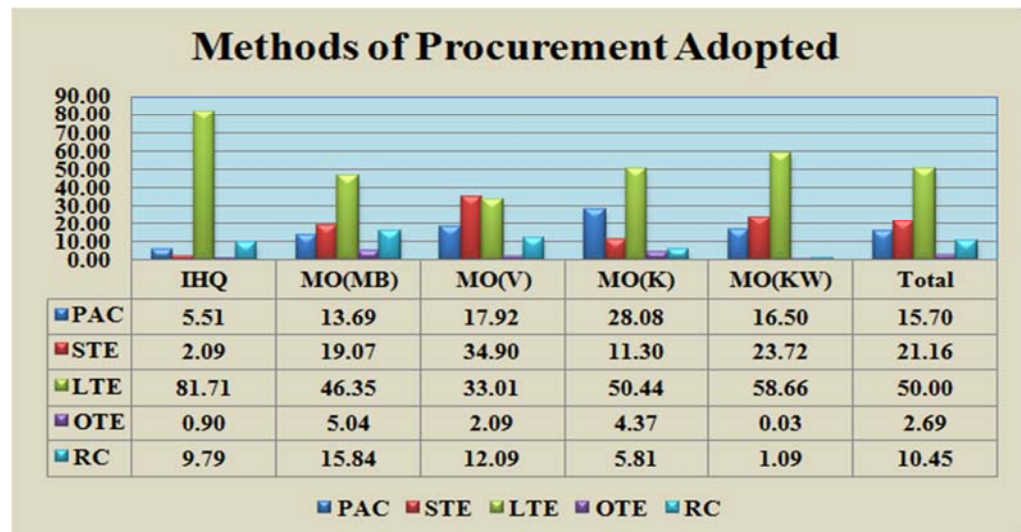
## 2.4 Procurement

Audit examined various aspects relating to procurement such as its method, adherence to internal lead time, procurement of obsolete items, reasonabilities of accepted rates and vendor management. The details are discussed in the succeeding paragraph.

### 2.4.1 Methods of procurement followed by MOs

Audit examined (March 2016)<sup>20</sup> the purchase orders placed between 2010-11 and 2015-16 with reference to the methods of procurement adopted by the IHQ MoD (Navy) and MOs as given below:

Figure-2.8: Methods of procurement



Source: ILMS data provided by IHQ MoD (Navy)

It was seen that percentage of purchase orders concluded on PAC, STE and LTE<sup>21</sup> basis were 15.70, 21.16 and 50.00 respectively whereas the percentage of purchase orders concluded on OTE and RC<sup>22</sup> were only 2.69 and 10.45

<sup>20</sup> Figures updated as on 31 March 2016

<sup>21</sup> PAC- Proprietary Article Certificate      STE-Single Tender Enquiry

LTE- Limited Tender Enquiry

<sup>22</sup> OTE-Open Tender Enquiry      RC-Rate Contract

respectively. Procurement based on PAC, STE and LTE leads to reduced competition/monopolistic situation and resultant higher rates.

Indian Navy cited (August 2016) the limited source of supply, specific requirement for Indian Navy, non-disclosure of part numbers by Russians etc. as reasons for resorting to PAC/LTE. The contention of Indian Navy is not agreed to, as PAC and LTE methods were resorted to for procurement of the same item, which indicates granting of PAC status to a particular firm lacked rationale.

#### 2.4.2 Internal Lead Time<sup>23</sup> from indent to procurement

As per Defence Procurement Manual (DPM-2009), the time prescribed for procurement under single and two bid systems, for activities starting from vetting and registration of indents up to placement of purchase orders (Internal Lead Time) is 19 and 23 weeks respectively. Audit observed that there were delays in approval of indents from the vetting and registration stage. Besides, delays were also observed in placement of the purchase order after approval of the indents.

##### 2.4.2.1 Delay in approval of indents

The DPM prescribes one week for vetting and registration of indent. However, Audit found that there was considerable delay in approval of indents by IHQ MoD (Navy)/MOs as indicated below:

**Table-2.4: Time taken for approval of indents**

Time taken for approval of indents	Indents raised from 01-04-2010 to 31-03-2015 <sup>24</sup>						Percentage of Total indents
	MO (MB)	MO (V)	MO (K)	MO (KW)	IHQ, MoD	Total	
within 1 week	434	1,146	506	692	28	2,806	18.08
2 to 23 weeks	3,550	4,181	1,140	1,476	160	10,507	67.68
Beyond 23 weeks	635	325	182	36	25	1,203	7.75
Yet to be approved	245	599	126	13	24	1,007	6.49
<b>Total</b>	<b>4,864</b>	<b>6,251</b>	<b>1,954</b>	<b>2,217</b>	<b>237</b>	<b>15,523</b>	

Source: ILMS data provided by IHQ MoD (Navy)

Only 18.08 per cent indents were approved within the prescribed time limit of one week, whereas 7.75 per cent indents were approved after 23 weeks, which

<sup>23</sup> Internal Lead Time is the time taken between date of indent and date of purchase order

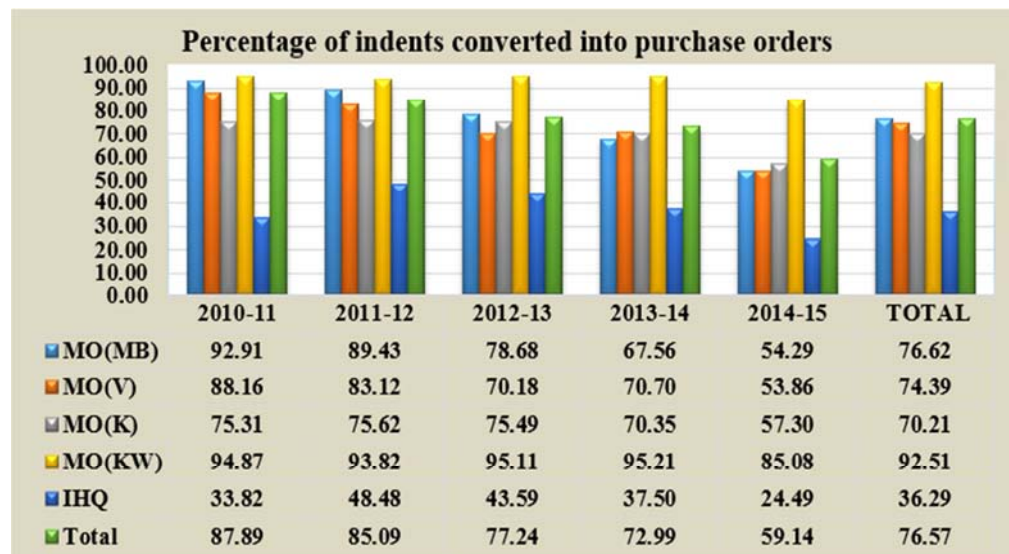
<sup>24</sup> Indents raised during 2015-16 not taken into account as its approvals will be delayed beyond the year 2015-16

is actually the time prescribed for completion of all activities till placement of order. Thus, excessive delays in approval of indents by the provisioning agencies resulted in consequent delays in placement of purchase order. Audit observations (September 2015/December 2015) on the issue were not addressed by MO (MB)/IHQ MoD (Navy) in their reply (October 2015/August 2016).

**2.4.2.2 Delay in placement of purchase orders**

Audit observed (September 2015 to December 2015) that out of 15,523 indents raised by IHQ MoD (Navy)/MOs from April 2010 to March 2015<sup>25</sup>, only 11,886 (76.57 per cent) indents could be converted into purchase orders till 31 March 2016 as given below:

**Figure-2.9: Total indents conversion into purchase orders (in percentage)**



Source: ILMS data provided by IHQ MoD (Navy)

From the above, it is evident that as on March 2016, out of total indents approved during the year 2014-15, the conversion of indents into purchase orders ranged from 24.50 to 85.00 per cent whereas during the year 2010-11, conversion of indents into purchase orders ranged from 33.80 to

<sup>25</sup> Cases/indents initiated in 2015-16 not taken into account as its conversion to purchase orders require time.

94.90 *per cent*. This indicates that in subsequent years, more time was taken to convert indents into purchase orders.

Delay in conversion of indents into purchase orders placed as on 31 March 2016 by IHQ MoD (Navy)/MOs *vis à vis* 11,886 indents is tabulated below:

**Table-2.5: Delay in conversion of indents into purchase orders**

Period within which indents were converted into purchase orders	Indents raised from 1 April 2010 to 31 March 2015						Percentage of Total indents
	IHQ MoD (Navy)	MO (MB)	MO (V)	MO (K)	MO (KW)	Total	
Within 23 weeks	17	1,145	2,054	423	1,112	4,751	39.97
24 weeks to above 3 years	69	2,582	2,596	949	939	7,135	60.03
<b>Total</b>	<b>86</b>	<b>3,727</b>	<b>4,650</b>	<b>1,372</b>	<b>2,051</b>	<b>11,886</b>	

*Source: ILMS data provided by IHQ MoD (Navy)*

The above table reveals that 60.03 *per cent* of the indents were converted into purchase orders after the prescribed time limit of 23 weeks, which indicates that indents raised with definite purposes were unable to meet the indented objective due to weakness in procurement system. In response to audit query, MO (MB)/IHQ MoD (Navy) acknowledged the delays and stated (October 2015/August 2016) that the actual materialisation within 23 weeks was 42.19 *per cent*. Further, IHQ MoD (Navy) attributed the delays to cancellation of indents, difficulty in sourcing from Russian firms, exaggerated pricing, expiry of Proprietary Article Certificate (PAC) etc. and stated that adhering to the timelines provided in DPM was not feasible.

The reply is not acceptable as the status worked out by Indian Navy is as of August 2016 whereas the status worked out by Audit is as of March 2016. The fact remains that timelines for procurement activities are prescribed in the DPM and are thus sanguine and Indian Navy's inability to meet the prescribed timeliness is indicative of adverse impact on meeting the requirements timely.



### **2.4.3 Procurement of common use items of Naval store**

Ministry of Defence, in its ATN (April 2006) had stated that OTE was being progressively adopted for common use items<sup>26</sup> having general specifications. Audit noticed (November 2016) that out of 497 cases for procurement of common use items by MOs, only 11 cases were processed under OTE and 189 cases under RC. This indicates that the quantum of procurement of common use items made on OTE and RC basis was only 40.24 *per cent* which shows that assurance made in the ATN had not been implemented.

### **2.4.4 Procurement of obsolete<sup>27</sup> items**

An equipment/store for which approval has been given for its withdrawal from service is referred to as obsolete whereas the equipment/store, for which no further provision will be made but the existing stocks, if any, will be used till these are exhausted are considered as obsolescent. Anticipation and appropriate response to Naval inventory becoming obsolete/obsolescent<sup>28</sup> is a major responsibility of material planners, so that obsolete/obsolescent stock is kept to the minimum. The obsolete/obsolescent equipment are to be appropriately flagged on ILMS so that no further review is undertaken and all procurement activities are discontinued.

Audit found (November 2016) that:

- An item convertor was declared obsolete in the year 1999. An import indent was raised by MO (V) in June 2008 for the convertor. Contract was concluded (May 2010) by CPRO (V) with M/s SME, Russia costing \$66,244.50 (₹1.19 crore) for procurement of four convertors which were held in stock as of October 2016.
- An indent raised by MO (V) in June 2008 contained three items *viz.*, set of bushes for motor HP pump, ball bearing and V ring, which were subsequently declared obsolete between June 2009 and January 2010.

---

<sup>26</sup> Example of common use items are soaps (toilet/laundry), varnish paints, Soda ash, various types of paints, polythene bags, computer papers, bleaching powder, acids, naphthalene balls, scrubbing brush, cotton rags etc.

<sup>27</sup> Obsolete- an equipment/store for which approval has been given for its withdrawal from service.

<sup>28</sup> Obsolescent- An equipment/store, for which no further provision will be made but the existing stocks, if any, will be used till these are exhausted.



However, the purchase order was placed in April 2010 by MO (V) at a total cost of ₹75.49 lakh. These items were lying in stock (November 2016) without issue.

Further, Audit examination revealed that from 2010-11 to 2015-16, 1,463 items were purchased at a cost of ₹46.92 crore after being declared obsolete as tabulated below:

**Table-2.6: Details of procurement of obsolete items**

MO/IHQ	No. of items	Value (₹ in crore)
IHQ	539	19.94
MO (MB)	260	7.56
MO (V)	354	12.65
MO (K)	167	4.95
MO (KW)	143	1.82
<b>Total</b>	<b>1,463</b>	<b>46.92</b>

*Source: ILMS data provided by IHQ MoD (Navy)*

The procurement is indicative of lack of due diligence from the material planners while making procurement decisions. In response, Indian Navy accepted the Audit's view stating that suitable provisions/remedies will be adopted to minimise the above situation in the ILMS version 2.0<sup>29</sup>.

#### **2.4.5 Vendor management**

Developing adequate vendor data base is significant in procurement process of inventory because of its peculiarity. Audit had recommended in its previous report that vendor base needs improvement and a time bound plan be implemented to link all the items in the inventory with the vendors. Though Indian Navy agreed that the system needed to be strengthened, the Ministry's ATN (April 2006) was silent on the issue.

An analysis of vendor database and year-wise registration of vendors (December 2015) maintained by MOs and IHQ MoD (Navy) is tabulated below:

---

<sup>29</sup> Integrated Logistics Management System (ILMs) presently being used by Indian Navy is Version 1. Indian Navy is planning to upgrade it to ILMS Version 2.0 in order to bring all the stakeholders viz., Naval Dockyard, Ships, WOTs etc. on to a single platform in order to bring total asset visibility.

Table 2.7: Details of vendor registration

Year	Origin of vendor registered		Total	MO wise vendor Registration Figures				
	Indigenous	Foreign		IHQ MoD (Navy)	MO (MB)	MO (V)	MO (K)	MO (KW)
2009	323	28	351	0	331	0	1	19
2010	308	18	326	0	322	0	0	4
2011	183	69	252	0	252	0	0	0
2012	159	22	181	0	181	0	0	0
2013	98	29	127	1	126	0	0	0
2014	120	6	126	0	126	0	0	0
2015	59	1	60	0	60	0	0	0

Source: ILMS data provided by IHQ MoD (Navy)

It is evident from the above that the process of vendor registration is showing a decreasing trend indicating that process of widening the vendor database is slow. This may lead to delay in finding out eligible vendors and converting of indents to tenders, since vendors had to be identified through *ad hoc* methods. Among the four MOs, more than 99 per cent of the vendor registration done from 2009 onwards has been done by MO (MB). Audit further noticed that out of 17,524 vendors existing in ILMS, 13,575 vendors were approved prior to the year 2000 and 10,061 vendor were classified<sup>30</sup> as class 'F', 56 vendors as class 'M', 5,990 vendors as class 'E' 1,303 vendors as class 'D', 11 vendors as class 'B' and 56 vendors as class 'A'. Only 7,463 vendors were, therefore available in business category with MOs, out of which many vendors had multiple registration with Indian Navy.

In response, Indian Navy stated (February 2016) that prior to migration to ILMS single server, each MO had its own vendor database. Indian Navy further stated (February 2016) that ILMS did not have an option to allocate unique vendor code with multiple address option for local area identification and that the issues brought out by audit were noted for implementation under version-2.0 of ILMS.

The system of vendor management therefore allowed the same vendor to get registered with different procurement agencies *i.e.*, MOs and IHQ MoD (Navy) as a result of which, the same vendor existed in the vendor database

<sup>30</sup> Class of Vendor: Class 'F'- Unsuitable vendors, Class 'M'- Manufacturers, Class 'E'- New Traders, Class 'D'-New OEM/Distributers, Class 'B'-OEMs/Distributers and Class 'A'- OEMs/Distributers self-certified OK.

under multiple vendor codes. Further, flaw in ILMS post migration to ILMS single server relating to non-allocation of unique vendor code irrespective of different addresses still persists (March 2017).

## **2.5 Demand Compliance**

Demand compliance is defined as the percentage of demands against which issues could be made within that year. Demands raised by ships, establishments, repair agencies and other Naval formation are vetted before the issue of stores. Thereafter, stores for issue is authorised by CMP.

Demands are broadly categorised in two parts as mentioned below:

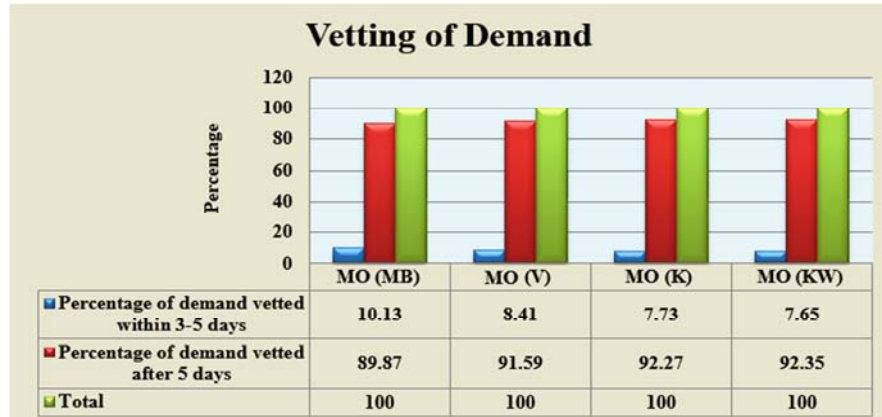
- 1) User Raised Demand: these demands are raised by user units, in the form of
  - Normal Demand- are raised to fulfill the requirement against the laid down allowances for user.
  - Urgent Demand- are raised to meet genuine urgency.
  - Operational Demand-are raised to meet an operational requirement of ships.
  - Refit Planning Procedure (RPP) Demand are raised by repair agency (Naval dockyards) 58 weeks and 30 weeks for Medium Refit (MR)/Normal Refit (NR) and Short Refit (SR) respectively, before commencement of refit, to be activated during the refit.
- 2) Raised in Office (RIO) Demand: these demands are raised by MOs to meet requirements viz., operational turn around, automatic replenishment, initial issue and Inter Depot Transfer (IDT).

Audit had recommended in the previous Audit Report (2002) that standards for demand satisfaction should be clearly laid down, time in which demands are to be met should also be prescribed as an indicator. The Ministry in its ATN (April 2006) had stated that it was not practical to set standard for demand satisfaction, however, demand compliance within a specified period for the available stores/spares had been prescribed. Audit observed that no such time limit had been prescribed. However, Audit assessed the time taken in various processes of demand compliance which are discussed in succeeding paragraphs.

**2.5.1 Time taken in Vetting of Demands and Issue Authorisation**

As per Material Planning Manual-1995, Demands are to be vetted within five days of receipt with vetting remarks by CMP. Audit analysed (October 2015) the time taken for vetting of demand which are indicated below:

**Figure-2.10: Vetting of Demands for the period 2011 to 2015**

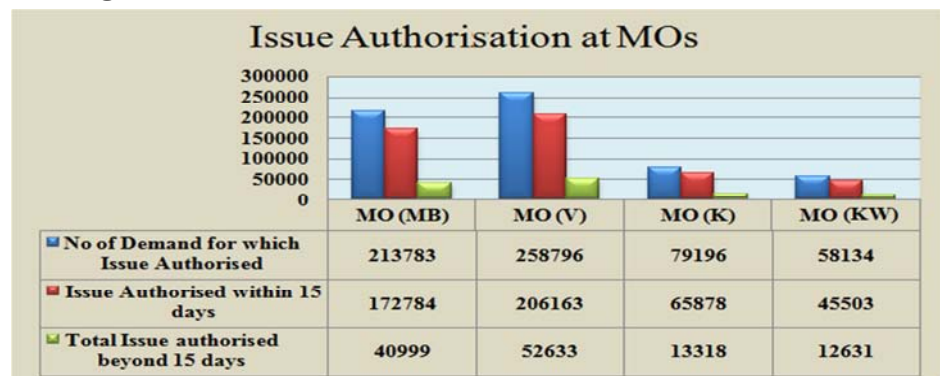


Source: ILMS data provided by IHQ MoD (Navy)

From the above, it is evident that only 7.65 to 10.13 per cent of demands were vetted at MOs within laid down timeline indicating slow progress in vetting by CMP.

Since norms have not been laid down for the time frame within which authorisation should be issued or an item delivered, audit could not figure out the delays in the process. However, audit analysed (August 2016) the time taken for issue of authorisation by the CMP as indicated below:

**Figure-2.11: Issue authorisation status as on 31 March 2016**



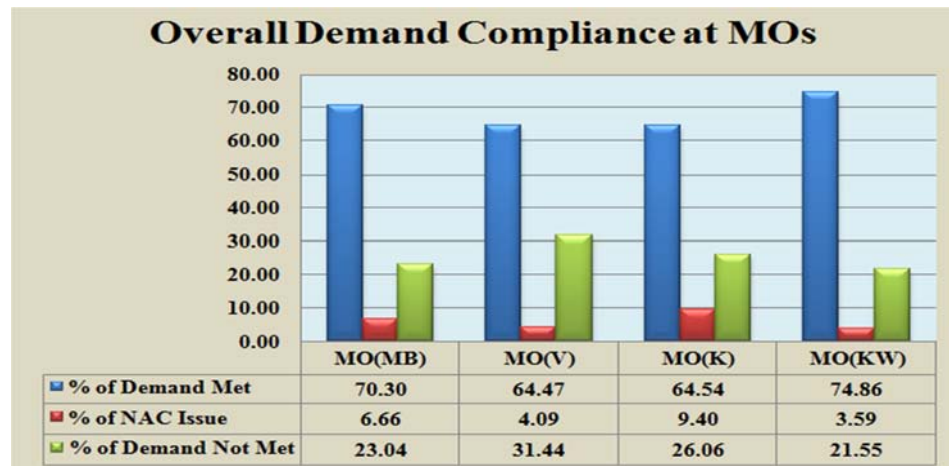
Source: ILMS data provided by IHQ MoD (Navy)

From the above it is clear that 21.73 per cent issues were authorised beyond 15 days.

### 2.5.2 Overall Demand Compliance

Audit Report of 2002 pointed out that the average demand satisfaction was 60 per cent in all the MOs. The ATN (2006) was silent on the issue. The results of audit examination (August 2016) of demand compliance from 2010-11 to 2015-16 at MOs is given below:

**Figure-2.12: Overall demand compliance as on 31 March 2016**



Source: ILMS data provided by IHQ MoD (Navy)

From the above, it is evident that demand compliance at MOs averaged at 70 per cent.

Audit further analysed the demand satisfaction with reference to different categories of stores and the details are given below:

**Figure-2.13: Category-wise demand compliance as on 31 March 2016**



Source: ILMS data provided by IHQ MoD (Navy)

From the above, it may be seen that the demand compliance in respect of Equipment and Spare Parts (E&SP) stores which is a critical factor<sup>31</sup> invariably ranged from 53.63 to 69.35 *per cent* for non-Russian stores and from 48.39 to 96.01 *per cent* in case of Russian stores. This affects the availability of ships/submarines, eventually impacting operational preparedness of the Indian Navy.

### **2.5.3 Refit Forecast Compliance**

Forecast List (FCL)<sup>32</sup> demand satisfaction signifies the quantity of spares supplied by the MOs in response to demands for spares placed by the refitting yards in FCL. It is an important indicator of performance of the agency that procures spares and is vital for timely completion of all refits. For ensuring timely availability of spares, Refit Planning Programme (RPP) stipulates that the refitting yards have to forward Standard Forecast List (FCL) of spares, determined on the basis of standard work package, to MOs 58 weeks and 30 weeks before the MR/NR and SR<sup>33</sup> respectively. In case of MR/NR, the MOs have to intimate the yards regarding the expected date of supply (EDS) of items and also a list of items which are not likely to be available before 20 weeks of Dockyard Starting Date (DSD<sup>34</sup>). Thereafter, the refitting yards forward 18 weeks in advance, the firm demands to MOs. Similarly, the list of Post Defectation Demands (PDDs)<sup>35</sup> for defects other than of routine type are forwarded to MOs 13 weeks and eight weeks before commencement of MR/NR and SR respectively. The ratio of 'Demanded Spares' available and issued to 'valid Forecast Compliance List (FCL) demands' is the basis on which percentage of compliance of FCL demand is calculated by MOs.

---

<sup>31</sup> E&SP are critical since non-availability of this can affect the operational capability of the ships as compared to Naval store.

<sup>32</sup> Forecast List (FCL): This includes spares required for refit of ship based on forecast approved by Naval Dockyard

<sup>33</sup> MR- Medium Refit, NR- Normal Refit, SR- Short Refit

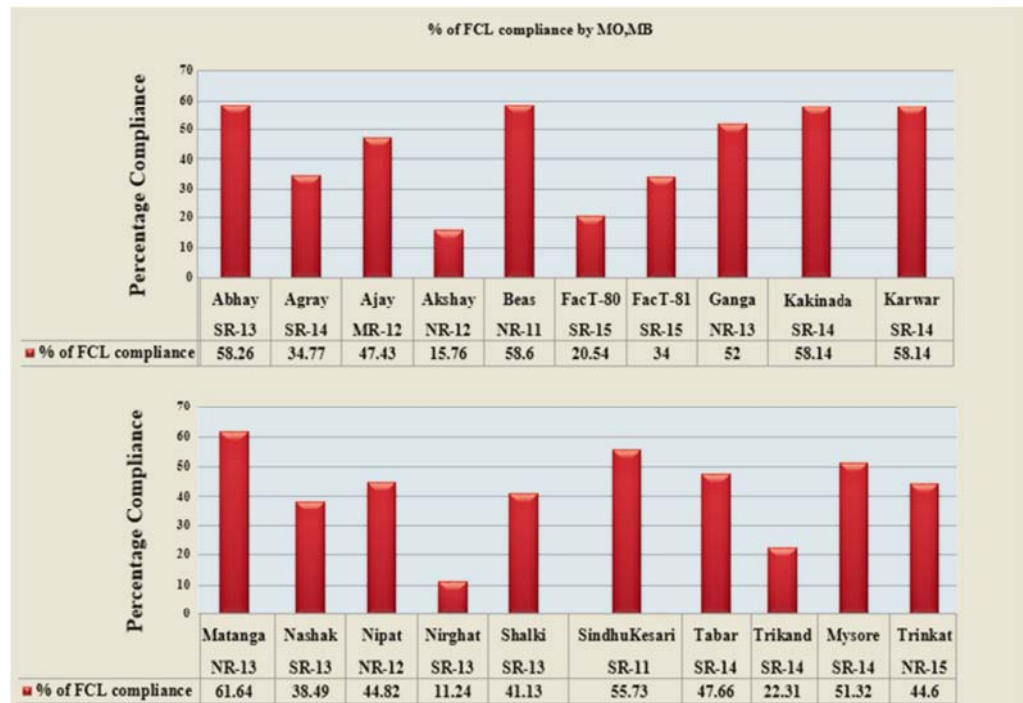
<sup>34</sup> DSD (Dockyard Starting Date)- the date indicating commencement of refit.

<sup>35</sup> Post Defectation Demand- Spares required for refit, need for which is evident only after opening of equipment/systems.

Audit Report (2002) had highlighted that compliance rate for supply of equipment and spares had been abysmally low, with overall compliance for ships refitted at Naval Dockyard, Mumbai from 1997 to 2000 ranging between 44 and 51 *per cent* only. The Ministry's ATN (April 2006) was silent on the issue.

Audit observed (July 2016) that percentage of refit forecast compliance of selected ships undertaken at Naval Dockyard (ND), Mumbai from 2010-11 to 2014-15<sup>36</sup> is as follows:

**Figure-2.14: Refit FCL Compliance**



Source: ILMS data provided by Naval Dockyard (MB)

The figure: 2.14 above reveals that percentage of FCL compliance in respect of refits of 20 ships was below 60 *per cent*. In case of four Naval Ships, audit observed that the refit forecast compliance was around 20 *per cent*. Low compliance affects completion of refits/routines which in turn impacts the operational availability of ships/submarines and defence preparedness of Indian Navy.

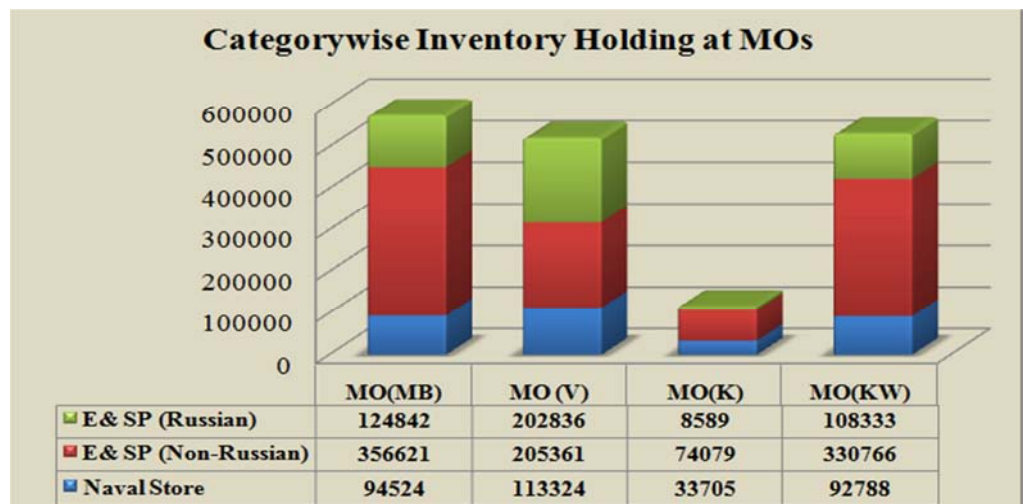
<sup>36</sup> Refits of 20 ships were selected for detailed audit, 2015-16 was not taken into account as it would be premature to comment before the commencement and completion of refits.

In response, Indian Navy [MO (MB)] stated (September 2016) that ratio of ‘Demanded Spares’ which had been issued and available to ‘Total number of valid uncanceled FCL demands’ is the basis on which percentage of compliance of FCL demands is reckoned and it ranged between 71 and 97 per cent. Contention of Indian Navy is not tenable as it was not supported with documentary evidence.

## 2.6 Inventory Holding

Inventory in the Indian Navy is accounted for in terms of number of items without any reference to the value, volume or weight of the inventories held<sup>37</sup>. Status of moving and non-moving items at MOs as of March 2016 is indicated below.

**Figure-2.15: Inventory Holding at MOs as on 31 March 2016**



Source: ILMS data provided by IHQ MoD (Navy)

<sup>37</sup> The above mentioned inventory data, though stated to be in number of items, actually referred to number of ledger pages (number of records in the item table in ILMS) for the following reasons:

- (I) A Large number of items have no stock, and also, have had no transaction for long periods and are hence, notional.
- (II) Many items shown in the inventory belong to decommissioned ships/aircraft but are awaiting action for segregation and disposal
- (III) Many of the items surveyed back to the depots as repairable/scraps etc., are lying without further action.

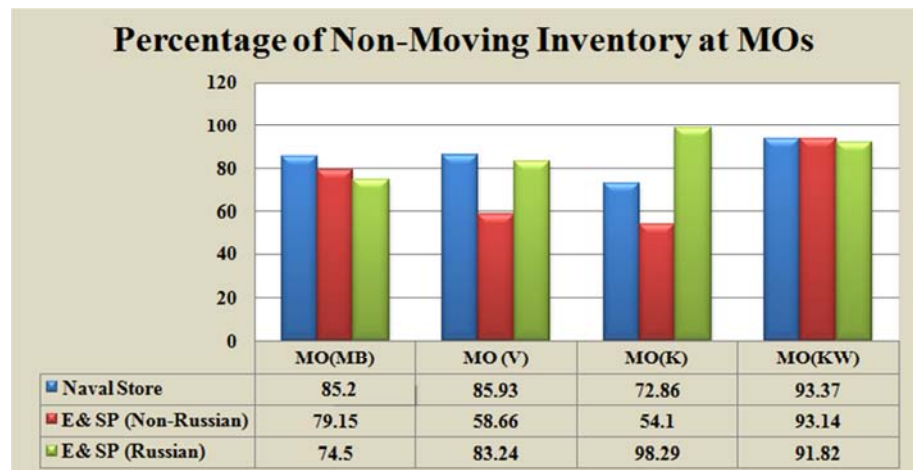


### 2.6.1 Analysis of Moving and non-moving Inventory

The inventories are classified as moving<sup>38</sup> (which includes fast moving and slow moving items) and non-moving inventory<sup>39</sup>. Audit Report (2002) had highlighted large non-moving inventory at over 65 per cent and recommended that its reduction must be a ‘high focus area’. The Ministry in its ATN (April 2006) had stated that segregation of surplus stores was continuously being progressed.

Audit noticed (October 2015/August 2016) that non-moving inventory across all MOs varied from 72.86 to 93.87 per cent (Naval Stores), 54 to 93 per cent (E&SP non-Russian) and 74.50 to 98.29 per cent (Russian) as reflected in the chart below:

**Figure-2.16: Non-moving inventory at MOs as on 31 March 2016**



Source: ILMS data provided by IHQ MoD (Navy)

The response of Indian Navy to the audit observation (August 2016) was awaited (March 2017).

Thus, the level of percentage of non-moving inventory has increased *vis à vis* its holding observed in the Audit Report (2002). This is indicative of surplus procurement constraining the storage space and unhealthy inventory management.

<sup>38</sup> Fast moving item means movement of stores within last two years; slow moving item means movement of stores within last 2 to 5 years.

<sup>39</sup> Non-moving means non-movement of stores within last 5 years.

## **2.6.2 Serviceable Surplus Stores (SSS<sup>40</sup>)**

A large number of Serviceable Surplus Stores (SSS) has been accumulated in the Indian Navy today principally because of inadequate disposal rate in the past. Serviceable Stores Surplus are unavoidable because of the need to maintain insurance stocks<sup>41</sup> and war reserves<sup>42</sup> in a fighting service and the inability to forecast their obsolescence adequately in advance. Stores also become surplus due to excessive initial provisioning, excessive projections in user-compiled lists, wrong Annual Consumption Limit (ACL) calculation, multiple accounting and stocking, and use of faulty provisioning formula.

The MPM stipulates that stock of an item should be between Minimum Stock Level (MSL) and Upper Stock Level (USL), as per the category of the item and its ACL.

The analysis of stock level of items at the MOs revealed that MPM's stipulations were not adhered to and a sizeable number of moving items were above USL and below MSL as discussed in the subsequent paragraph.

### **2.6.2.1 Inventory held as surplus**

Material Planning Manual-1995 stipulates saving in material management through maintaining lean inventories as with calculation of cost of money at 16 *per cent* and inflation at 8 *per cent* per year, e.g., net annual carrying cost of inventory worth ₹1,000 crore is ₹80 crore.

Audit observed (October 2015/August 2016) that there was accumulation of large quantum of items in MOs in excess of USL contributing towards serviceable surplus stores worth ₹7,359.37 crore as indicated in Table 2.8 below:

---

<sup>40</sup> Serviceable Surplus Stores-These are materiel in serviceable condition for which there is no foreseeable requirement in the Indian Navy. Even if an item is still in use, that quantity of it which cannot be used in the Navy within its shelf-life and non-insurance item, cannot be within the next 7 years may be treated as surplus.

<sup>41</sup> Insurance Stock- These are the stock required to maintain and repair a ship during the first five years of commission as a part of base and depot spares. Insurance spares are to be procured as B&D spares.

<sup>42</sup> War Reserve- These are stocks of materiel which an MO is required to maintain to meet the needs of operations. These are to be held additional to MSL.

**Table-2.8: Total Inventory<sup>43</sup> above USL as on 31 March 2016**

Name of Stock holding Authority	Stocked Inventory Held (by type)	No of serviceable items having Positive Stock balance	Total No of Item above USL out of column 3	Cost of the quantity held in excess of USL (₹ in crore)	% age of the item in excess of USL (%age of Column 4 wrt Column 3)
1	2	3	4	5	6
MO (MB)	4,77,899	2,74,446	2,51,755	3,925.21	91.73
MO (V)	3,42,992	2,09,464	1,85,299	2,886.59	88.46
MO (K)	77,316	47,846	42,984	216.86	89.84
MO (KW)	47,073	28,653	23,001	330.71	80.27
<b>Total</b>				<b>7,359.37</b>	

Source: ILMS data provided by IHQ MoD (Navy)

For the excess inventory above USL worth ₹7,359.37 crore, the inventory carrying cost works out to ₹588.75 crore per annum. Out of the above, moving inventory worth ₹2,100.7 crore were held above the prescribed USL as indicated in Table 2.9 below:

**Table-2.9: Moving Inventory above USL as on 31 March 2016**

Sl. No.	Name of MO	Total Inventory (No of Item by Type)	Total Moving Inventory	Moving Inventory Over and Above USL	% age of Excess moving Inventory Over and above USL with respect to total moving Inventory	Cost of Moving Inventory over and Above USL (₹ in Crore)
1	MO (MB)	4,77,899	93,135	26,762	28.74	1,006.08
2	MO (V)	3,42,992	93,814	26,952	28.73	973.63
3	MO (K)	77,316	20,909	6,885	32.93	61.12
4	MO (KW)	47,073	24,584	5,904	24.02	59.87
<b>Total</b>						<b>2,100.70</b>

Source: ILMS data provided by IHQ MoD (Navy)

A large inventory requires more storage space, more staff, additional transportation and handling costs as well as high risk of deterioration and obsolescence of the stock held. This creates extra burden on exchequer in management of inventory.

An analysis of items held above USL at MOs revealed that at current ACL, the existing stock would be utilised over a period of more than 100 years as indicated in the Table 2.10 below:

<sup>43</sup> This includes both moving and non-moving inventory

**Table-2.10: Utilisation of inventory above USL as on 31 March 2016**

Years to Last	No of Items at MO (MB)	Total cost (₹ in crore)	No of Items at MO (V)	Total cost (₹ in crore)	No of Items at MO (K)	Total cost (₹ in crore)	No of Items at MO (KW)	Total cost (₹ in crore)
more than 100 years	2,641	1,47.2	1631	363.61	258	5.68	164	<b>4.60</b>
50 to 100 years	2,347	90.16	1,902	62.37	407	4.35	191	<b>7.05</b>
5 to 50 years	14,641	491.36	14,502	404.2	3,891	37.91	2,819	<b>32.67</b>
up to 5 years	8,617	110.72	10,635	143.45	3,017	15.26	2,761	<b>15.55</b>
<b>Total</b>	<b>28,246</b>	<b>839.44</b>	<b>28,670</b>	<b>973.63</b>	<b>7,573</b>	<b>63.2</b>	<b>5,935</b>	<b>59.87</b>

Source: ILMS data provided by IHQ MoD (Navy)

Holding of huge inventory with no potential utilisation in near future, constrains the storage space with the MOs apart from the liability of inventory carrying cost<sup>44</sup>.

MO (V) accepted (January 2016) the audit finding and stated that 1.75 lakh items worth ₹3,003 crore were held above USL and are accounted as B&D spares. MO (MB) stated (August 2016) that the inventory accumulated was inclusive of B&D spares received for the ships (including ships that had been decommissioned/transferred to other commands) and confirmed the existence of ground stock of 2,35,149 items worth ₹5,526 crore above USL, of which 1,79,363 items worth ₹3,364 crore were B&D spares. MO (MB) further added that procurement of spares for the equipment being phased out, change of base port of ships, transfer to other MOs, items projected by Naval Dockyards without raising demand etc., contributed to the above scenario.

The accumulation of moving inventory worth ₹2,100.70 crore indicates lack of diligence in ranging and scaling of stores at the time of initial provisioning; excess projection in user complied list<sup>45</sup> of spares coupled with flaw in the provisioning methodology/error prone PQ formula applied by the Indian Navy in inventory automation.

<sup>44</sup> Inventory Carrying Cost- It is the financial cost incurred from the time payment is made to the supplier to the time the item is issued or disposed off. This is primarily the cost of blocked money.

<sup>45</sup> User complied list- It consists of forecast demands for mandatory and anticipatory spares for ships under refit projected by Naval dockyards to Material organisations

### 2.6.3 Non-maintenance of Minimum Stock Level

Minimum Stock Level (MSL) is the level beyond which stock of any items should not be allowed to fall. Audit observed (September/November 2015) that stock level of large number of items pertaining to the part of moving inventory *i.e.* (ACL>0) were below MSL as indicated below:

**Table-2.11: Detail of inventory below MSL as on 30 November 2015**

Name of MO	Total Inventory (No. of Item by Type)	Total Moving Inventory	No. of Items below MSL			
			Vital (V)	Essential (E)	Desirable (D)	Total
MO (MB)	4,77,899	93,135	6,098	13,140	12,008	31,246
MO (V)	3,42,992	93,814	3,955	9,825	16,981	30,761
MO (K)	77,316	20,909	1,623	2,149	4,506	8,278
MO (KW)	47,073	24,584	2,955	4,923	4,659	12,537

*Source: ILMS data provided by IHQ MoD (Navy)*

Items stocked below MSL means that necessary safety stock is not being maintained and chances of stock out are higher, which is a cause of concern for the inventory management. The fact remains that non-maintenance of MSL defeats its very purpose besides being indicative of a lack of systematic control of inventory management.

### 2.6.4 Status of Obsolete/Obsolescent<sup>46</sup> Inventory

As per guidelines, obsolete/obsolescent stock is to be kept down to minimum and such equipment are to be appropriately flagged on ILMS so that no further review is undertaken and all procurement activities are to be discontinued as mentioned in Para 2.4.4 of this report.

Audit noticed (November 2016) that a substantial part of stock held by all MOs was either in obsolete or obsolescent condition as given below:

<sup>46</sup> Obsolete- These are items of Naval stores and spares which can no longer be used for any cost-effective purpose in the Indian Navy.

Obsolescent- Naval stores become obsolescent when their function disappears or when they are substituted by new items. Spares, both equipment and spare parts, become obsolescent when it is decided to phase out that equipment for which no further provision will be made but the existing stocks, if any, will be used till these are exhausted.

**Table-2.12: Details of holding of Obsolete/Obsolescent items as on 31 March 2016**

Details of Inventory		Name of Material Organisation				Total
		MO (MB)	MO (V)	MO (K)	MO (KW)	
Total serviceable Inventory with net stock (stock held + dues in – dues out )>0	1	2,61,626	1,98,256	44,814	30,525	5,35,221
Out of 1 above, total Inventory which are either obsolete or obsolescent (INCAT-N) (Nos)	2	91,447	59,478	7,352	2,877	1,61,154
Percentage of INCAT N Inventory to total Inventory {Sl.NO.(2/1)*100}	3	34.95	30.00	16.41	9.43	30.11
Out of 2 above, Number of item which are obsolete	4	10,171	16,501	2,914	686	30,272
Percentage of obsolete Inventory to total Inventory- {(4/1)*100}	5	3.89	8.32	6.50	2.25	5.66

Source: ILMS data provided by IHQ MoD (Navy)

It is evident from the Table 2.12 that the percentage of obsolete/obsolescent items lying in stock at all MOs was almost 30 *per cent* of the total inventory. Out of this, 5.60 *per cent* are obsolete occupying scarce space despite utility value being negligible. Indian Navy accepted the contention and agreed for the adoption of suitable provision/remedies to minimise the above scenario.

### 2.6.5 Holding of Shelf Life Expired Items

Material Planning Manual stipulates avoidance of shelf life expired items. Audit observed (August 2016) that MOs were holding shelf life expired items as of June 2016 as mentioned below:

**Table-2.13: Status of Life expired items as on 30 June 2016**

Name of MO	No. of life expired item (By type)	Cost of life expired items (₹ in crore)
MO (MB)	391	3.70
MO (V)	95	3.75
MO (K)	891	7.83
MO (KW)	114	1.49
<b>Total</b>	<b>1,491</b>	<b>16.77</b>

Source: ILMS data provided by IHQ MoD (Navy)

Audit observed that the life expired items though to be disposed off expeditiously were lying as non-moving without segregation awaiting disposal. The response from Indian Navy addressing these issues was awaited (March 2017).

### 2.6.6 Disposal of Inventory

Inventory identification and weeding out of unnecessary items as Serviceable Surplus Stores (SSS) is of prime importance to maintain a lean inventory. The origin of problem of non-moving inventory lies in the ineffective functioning of these processes viz., Identification and Disposal of SSS items.

The Audit Report of 2002 had highlighted that disposal of all categories of disposable items was low and recommended setting up of an empowered organisation on the lines of Special Surplus Stores Disposal Committee (SSSDC) in the Army for expeditious disposal actions. Ministry, in their ATN (April 2006), intimated that a proposal for creation of SSSDC under the Chief of Integrated Defence Staff (CIDS) was under the consideration of the Ministry. In response to audit questionnaire (July 2015), IHQ MoD (Navy) intimated (December 2015) that no committee had been formed, however, Serviceable Surplus Stores were being identified and would be disposed of as per IHQ MoD (Navy)'s policy letters in vogue.

Disposal of stores from 2010-11 to 2015-16 as intimated by MO (MB) and MO (V) is indicated in the table below:

**Table-2.14: Status of Disposal as on 31 March 2016**

Year	MO (MB) <sup>47</sup>		MO (V) <sup>48</sup>	
	No of Items Disposed off	Value realised (₹ in Lakh)	No of Items Disposed Off	Value realised (₹ in Lakh)
2010-11	6,480	50.32	2,781	1,477.86
2011-12	3,239	71.76	1,400	1,325.16
2012-13	9,928	32.75	25,579	1,301.53
2013-14	8,402	131.85	7,826	1,351.06
2014-15	1,872	79.11	50,538	725.83
2015-16	35	4.00	1,240	1,012.81

Source: Information provided by MOs

<sup>47</sup> In respect of MO (MB), disposed off items contains only 'SS' i.e., Surplus Serviceable items.

<sup>48</sup> In respect of MO (V), disposed off items contained 'SS' i.e., Surplus Serviceable, BER, contaminated Lub/Sullage Oil.

MO (K) intimated (August 2016) audit no disposal of surplus items identified (*i.e.*, 830 items since 2010) was carried out between 2010-11 and 2015-16.

From Table 2.14, it is clear that in respect of MO (MB) and MO (V) disposal activities were regularly being carried out, whereas MO (K) lagged behind in disposal action.

### **2.6.7 Standardisation of Equipment**

Material Planning Manual stipulates that there are many ‘stand-alone’ equipment, particularly of Indian Origin which serve identical purpose and the multiplicity of which causes problems in provisioning and procurement. Many of these equipment can be standardised without causing unaffordable redundancy of existing stocks. Proposals for such standardisation must emerge from MOs.

Audit in its Report (2002) had pointed out wide diversity in equipment fit on board in case of very common items even with respect to ships of the same class, recommending that policies for systematic equipment selection and standardisation need to be evolved and implemented particularly in indigenous shipbuilding projects. The Ministry’s ATN (April 2006) was silent on the issue.

Audit noticed that the Logistics Management committee in its report (2010) had pointed out that absence of a clear policy in the Indian Navy as the main reason for lack of standardisation. In response to audit query (July 2015) regarding the efforts made by Indian Navy towards standardisation carried out since 2002, IHQ MoD (Navy) furnished (December 2015) a list of 22 equipment/ assemblies/sub-assemblies that were stated to be standardised.

Audit however, observed (August 2016) from ILMS that Indian Navy still had a wide diversity in very common items onboard for instance in 39 type of HP Air Compressor, 16 types of Fresh and Feed Water Pump, eight types of Fire Pump, 30 types of Heat Exchanger, three types of Water Desalination RO Plants, 38 types of Sea Water Pump, 62 types of Pump, 19 types of Compressor, seven types of Servo Air Compressor, six types of Domestic Fresh Water Pump etc.



There were several makes of equipment which serve the same purpose and different items serving the same function. As a result, MOs continues to face difficulties in managing the inventories. The response of the IHQ MoD (Navy) was awaited (March 2017).

### **2.6.8 Stock Verification**

Stock verification of inventory facilitates reconciliation of differences between store held on ground and the ledger balances so as to detect short and excess holdings, identify wrongly accounted items, confirm physical locations, rationalisation of storage, identification of items needing preservation, noting change in conditions and identification of disposable stores. In the existing system, the stock verifier generates verification pick up list of stock quantity which consists of mandatory basis information of an item. Then the quantity of stock is physically verified with the pick list quantity. The details of discrepancies are then recorded.

General Financial Rules (GFR)-2005, prescribes that physical verification of all the consumable goods and material should be undertaken at least once in a year and discrepancies, if any, should be recorded in the stock register for appropriate action by the competent authority. Valuable and attractive items shall be mustered once a quarter and their correctness should be ensured.

The discrepancies found between physical and ledger balance at MO (MB), MO (V) and MO (K) except MO (KW) from 2010-11 to 2015-16 are given below:

**Table-2.15: Status of Stock Verification at MOs during the period 2010-11 to 2015-16**

Name of MO	Category of Stores	Total inventory	Period (cycle) as on Mar 16	Total discrepancies	No. of discrepancies settled (mismatch)	Balance discrepancies yet to be settled
MO (MB)	NS	1,00,110	2015-16	0	0	0
	E&SP (NR)	1,34,534	2014-16	326	0	326
	E&SP(R)	1,86,724	2014-16	6,056	0	6,056
MO (V)	NS	35,102	2016-17	193	65	128
	E&SP (NR)	1,32,364	2015-17	516	42	474
	E&SP(R)	1,00,504	2015-17 <sup>49</sup>	450	53	397
MO (K)	NS	21,415	2015-16	0	0	0
	E&SP (NR)	38,510	2014-16	905	120	785

*Source: Stock verification report of MOs*

**Note-** There is no uniformity in cycle of verification of stock, hence figures taken as available in report/return etc.

It is evident from the above table that the number of items with discrepancies in E&SP (R) category at MO (MB) was considerably higher and no appreciable progress had been achieved to reconcile the same. The progress of settling discrepancies at MOs were not satisfactory in Equipment and Spare Parts (E&SP) as compared to Naval Stores. Further, it was also noticed that there was no uniformity in the cycles of verification of stock across all the MOs and the quantum of stock to be verified during the particular period differed. Thus, annual stock verification, which is an effective tool of inventory management, is not applied effectively in the MOs.

In response to audit observation (July 2016), Indian Navy stated (August 2016) that settlement of mismatch was still in progress, however, it was consuming long time for reconciliation of transaction being of vintage. The Indian Navy also stated that since last two years approximately 1800 mismatch cases were physically verified which were being linked and were under process.

<sup>49</sup> Since no uniform cycle for stock verification has been promulgated across all the MOs. Hence each MO do it independently as per the cycle of that MO only. The updated position of stock verification was mentioned, therefore 2017 comes in case of MO (V) for 2015-17 cycle.

This strengthens the audit contention that there were discrepancies/mismatch between physical balance and ledger balance thereby affecting the status of stock balance.

#### **2.6.8.1 Discrepancy in Stock Verification**

Audit observed (November 2014/ August 2016) discrepancy in cyclic stock verification which is illustrated by way of an instance as discussed below:

Two pumps received at the MO (MB) in January 2013 based on an order placed in January 2012 were not issued to INS Viraat and had been lying in the stock since then. Further, four pumps received in March 1995 were held in stock of MO (MB), which identified (December 2012) these pumps as circulating type and took them on charge under a specific item code. Two of these pumps were issued (December 2012) to INS Viraat and remaining two pumps were in stock in January 2013, when additional two pumps costing ₹1.68 crore were received by MO (MB) under a purchase order placed in January 2012. In all, four pumps were lying in stock (August 2016). MO (MB) stated (December 2014) that the pumps received in March 1995 as Sea Water Pump for distilling plant module had NIL pattern number and thus, could not be accounted for in ILMS introduced in 1997 due to incorrect description. These pumps were later identified in December 2012 as pump circulating type and were accounted against the same item code of the later purchase and taken on charge.

Thus, inability of the Indian Navy to identify the item despite cyclic stock verification of the stores held in their store depot, resulted in the item costing ₹1.68 crore remaining in stock for 17 years.

#### **2.7 Integrated Logistics Management System**

Integrated Logistics Management System (ILMS) was introduced in 1993 to integrate and rationalise the provisioning procedures in Inventory Management System in Indian Navy. It assists in reducing the inventory holding and also the carrying cost of inventory. ILMS envisages reduction in manual interventions, which are “time consuming” and “error prone” by appropriate re-engineering of processes. Thus, smooth functioning of ILMS is

of critical importance for effective delivery of logistics support to ships/submarines and establishments of Indian Navy.

The Ministry in its ATN (April 2006) had stated that efforts were a foot to address the deficiency in the data base. Significant progress had been made in data refinement. Further, issues such as better hardware, improved connectivity between the depots as well as with the ships etc., were being addressed so as to make the system more robust for efficient and cost effective inventory management. Audit, however, noticed (November 2015) infirmities in ILMS as discussed in succeeding paragraphs.

### **2.7.1 Weakness in ILMS**

Audit observed (November 2015) instances of mismatch of data, existence of multiple item codes for same items and multiple vendor code for same vendor etc., which are indicative of lacuna/flaws in the present version of ILMS as mentioned below:

**Table-2.16: Discrepancy in ILMS as on 31 March 2016**

<b>Sl. No.</b>	<b>Nature of problem</b>	<b>Impact</b>
1	The purchase quantity and rate indicated in the purchase order file and that as per ILMS was different.	Incorrect data is allowed to be entered in ILMS
2	The stock values indicated in a module {indent item transaction for IFA (Navy)} of ILMS are different from the actual stock balance	Incorrectness of ILMS data due to non-updating of transactions in ILMS.
3	Multiple vendor codes exists for the same vendor in ILMS and same items being procured from different vendors exists in ILMS under different item codes.	Vendor code is an integral part of item code allocated to the items. The flaw in the vendor registration will lead to duplication of inventory, multiple accounting and stocking and hence notional increase in size of inventory holding.

MO (MB) stated (February 2016) that the details of quantity and rate indicated in the system may be disregarded as these are available in the purchase orders kept in the file, which is authentic. This substantiates the audit finding that incorrect data was allowed to enter in the ILMS.

As regards the query raised relating to multiple vendor codes for the same vendor, MO (MB) stated (February 2016) that items had been introduced at different intervals against various authorities wherein some of them were obsolete and having substitute linkage also. The contention of Indian Navy is not tenable since existence of multiple vendor code and same item under different item codes indicate inflated inventory thereby causing hindrance in rationalisation of Naval Inventory. As regards query relating to stock values indicated in a module, the response was awaited (March 2017).

### **2.7.2 Inadequacy of Control Mechanism in ILMS**

Relational Database Management System (RDBMS) on which ILMS is based, envisages the need to ensure correctness and completeness from the stage of data preparation itself. No system based control can check against the entering of meaningless data in the system. The refinement at the time of entry itself is very critical. Inadequacies of central mechanism are discussed below:

(A) The basis on which an indent is raised is indicated as 'indent choice' in ILMS, under various codes. Audit noticed (September 2015) that out of 5729 indents raised by MO (MB) during the period from 2010-11 to 2015-16, the indent choice was not indicated in 345 indents. In response, MO (MB) stated (February 2016) that certain types of indent do not fall under promulgated 'indent choice' category e.g. indents raised against RC, PAC, Repeat Order (RO) and Option Clause (OC). This is not agreed to as RC, PAC, RO and OC etc. are only methods of procurements whereas the choice of indents reflects the basis of the type of demand raised by customers/users. Hence, indication of 'indent choice' code in ILMS is indispensable. Further, as per MPM, no procurement can be initiated without an indent.

The acceptance of indents without ascertaining the 'indent choice' code i.e. the basis on which demands are raised by customers, is indicative of lack of control mechanism at data entry level in the ILMS.

- (B) Specific codes are provided in ILMS to indicate the condition of items in stock. Audit observed (September 2015) that codes not provided were also entered in ILMS as condition codes. Moreover, codes were entered in any number of combinations of capital and small letters *e.g.*, code "New" as per ILMS system was entered in the formats NEW and New, code 'Uns' was entered as 'uns', 'Uns' and 'UNS'. Even special characters such as apostrophes were entered as condition code.

In response, MO (MB) stated (October 2015) that five codes had been filled between 2006 and 2009 during the pre-migration phase and post-migration these checks had been incorporated in the system for a better appreciation of the data.

Contention of Indian Navy is not tenable as wrong codes were still existing which is indicative of a lack of control mechanism in ILMS at data entry level.

- (C) Specific codes are provided in ILMS to indicating the basis of modification of PPQ by POER. However, Audit found (September 2015 to January 2016) that modifications made in PPQ without indicating EV codes, were also accepted in ILMS, indicating lack of controls in input of data in ILMS.

### **2.7.3 Holding of items with multiple specifications**

It was highlighted in the previous Audit Report (2002) that progress of having the items specifications on the system was tardy. Indian Navy while agreeing to recommendation made by audit stated (2002) that items' specifications were being progressively compiled by interaction with various agencies and making them available on the ILMS. The Ministry's ATN (April 2006) was silent on the issue.

Audit observed (September 2015/March 2016) that Controller of Logistics (COL) had directed (January 2012) action towards reducing the multiple

specifications in respect of 12,464 items obtained through the ILMS. Further, though Indian Navy attempted to resolve the issue since January 2012, the progress achieved in this regard was not made available to audit (March 2017).

#### **2.7.4 Sub-optimal utilisation of a resource available in ILMS**

(A) ILMS provides the material planner a window of free (i.e., available for issue against fresh demands) stock position of a particular item across all the MOs, where planner can ascertain whether the existing stock position at some other MOs are available in surplus/excess and that can be gainfully utilised through Inter-Depot Transfer (IDT) in place of going in for a fresh procurement.

Audit found (October 2016) that 12 Magnetrons were held in stock at MO (MB) since August 2010. Further, four Magnetrons were procured (October 2011) by MO (V) at ₹3 crore. The stock at MO (MB) was subsequently transferred (April 2012) to MO (V) and 16 Magnetrons were held in stock (October 2016) at MO (V). Even though Magnetrons were held in stock at MO (MB), MO (V) failed to gainfully utilise the resources available in ILMS and procured the item at ₹3 crore which could have been avoided.

In reply, MO (V) stated that IDT was not sought prior placement of order as the subject equipment was still in service at Western Naval Command (WNC). This is not tenable in audit as the WNC could not assess the requirement of this item at the appropriate time resulting in the procurement of the item by MO (V). Had this item been transferred to the MO (V), procurement of this item worth ₹3 crore could have been avoided.

(B) ILMS as an automated inventory management system is supposed to provide meaningful and reliable information to the managers and users.

Audit found (November 2016) that IHQ MoD (Navy) was concluding contracts and purchase orders were placed manually and the details of these purchase orders were entered into the ILMS at a later date at the

time of receipt of the item. As a result of not entering such details into the ILMS, vital information such as 'Dues-In', Last Purchase Price (LPP), etc., which is crucial for making provisioning and procurement decision was not available in the system.

### **2.7.5 Non-integration of users, MOs and other agencies**

Integration of ILMS with all stake holders ensures seamless flow of information and total asset visibility at all levels. Audit had highlighted in its previous Audit Report of 2002 that there was no linkage between MOs, users, other agencies and systems within the Indian Navy, in ILMS. In its ATN (April 2006), the Ministry stated that the planned upgradation of ILMS would be undertaken with wider consultation on all concerns. As a starter, web based connectivity had been given to Dockyards and Command Headquarters. Connectivity to ships was also on the anvil. Audit found (July 2015/December 2015) that the integration of ILMS with all Commands, Dockyards, Technical Directorates, Indian Naval Ship Maintenance Authority (INSMA), Warship Overseeing Teams (WOTs) and user units was not yet achieved by the Indian Navy.

## **2.8 Conclusion**

An appropriate inventory management system supported by well-designed forecasting, provisioning, review system is required for effective inventory management and to minimise downtime and stock out situations. An amount of ₹6,731.75 crore was incurred by Indian Navy for procurement of Naval Stores, Equipment and Spare Parts from 2010-11 to 2015-16 *i.e.*, the period covered in the PA. The ILMS based replenishment provisioning followed by Indian Navy is expected to generate more precise requirement projections with minimum manual intervention. However, the provisioning formula presently followed by the Indian Navy generated excess provisioning quantity due to an inbuilt error, thereby necessitating full manual intervention. Indian Navy was not following the selective inventory control methods in conformity with the laid down norms. The procurement methods followed were not in conformity with the assurance made by the Ministry in its ATN (April 2006). Indian Navy



routinely resorted to procurement of obsolete items against laid down guidelines. There were considerable delays at various stages of procurement *vis à vis* the lead time prescribed. No time limits were prescribed for assessment of demand compliance and various demand related activities. Huge quantities of non-moving inventory were held in stock across all MOs, adding to the inventory carrying cost. On the other hand, minimum required stock levels of vital and essential stores were not being maintained by all the MOs. Errors and omissions continued to afflict the stock verifications being conducted at MOs. The Integrated Logistics Management System (ILMS) which was introduced in 1993 has been running with data integrity issues, master data cleaning requirement and lack of networking across MOs and users.

The matter was referred to the Ministry (November 2016); their reply was awaited (March 2017).

## CHAPTER III: MINISTRY OF DEFENCE- INDIAN NAVY

### 3.1 Accidents of ships and submarines in Indian Navy

The loss of a ship/submarine adversely affects the operational preparedness of the Indian Navy, as acquisition of new ships/submarines involves procurement/ construction process of more than eight to ten years. It is, therefore, imperative that Indian Navy maintains its assets free from accidents during peacetime evolutions. Between 2007-08 and 2015-16, Indian Navy Ships and Submarines were involved in 38 accidents, primarily attributable to fire/explosion/flooding. These accidents led to a loss of two Naval Ships and one Submarine in addition to loss of precious lives. The Indian Navy since inception, has no institutionalised framework to deal with safety issues. A dedicated organisation for dealing with safety issues was setup by the Indian Navy only in 2014, however, it awaits Government's sanction.

#### 3.1.1 Introduction

3.1.1.1 The principle of safe working practices is particularly relevant to a fighting force, such as the Indian Navy, where men and material are very often employed in hazardous and stressful environments. The existence of inflammable material, running machinery, high-voltage equipment and explosives, apart from the fact that the ship is a constantly moving platform subject to conditions such as weather, collision and grounding contribute to a hazardous environment. Any chain of mishaps could lead to a major catastrophe. Besides, both naval personnel and naval equipment are difficult and expensive to replace, as acquisition of new ships/submarines involves procurement/construction process of more than eight to ten years, and therefore, accident prevention is a very important aspect of the organisational setup. In view of the recent spate of ship and submarine accidents, the audit of Naval Ship and Submarines accidents was taken up with the following Audit Objectives:

- (i) To assess whether measures for preventing accidents of Naval Ships and Submarines are adequate?
- (ii) To assess whether accidents are investigated by competent Board of Officers to assess the reasons for the accidents and whether the recommendations of the boards are implemented effectively in time?
- (iii) To assess whether rescue and salvage operations were expeditious?
- (iv) To assess whether losses due to accidents have been assessed and regularised in time?

#### **Sources of Audit Criteria**

- Regulations for the Navy, Part-II Statutory
- Relevant Navy Orders *i.e.*, Policy on Board of Inquiry (BoI), Nuclear, Biological and Chemical Defence (NBCD) Policy for surface ships etc.
- Integrated Headquarters Ministry of Defence (Navy) {IHQ MoD (Navy)} Policy Letters on safety issues
- Financial Regulations Part-I

#### **Scope and methodology of Audit**

The audit covered the Naval Ship and Submarine accidents which occurred between 2007-08<sup>1</sup> and 2015-16. The audit scope, objectives and criteria were discussed with the Principal Director (Naval Operations), Principal Director (Personnel Services) and other concerned authorities at IHQ MoD (Navy) in an entry conference held in May 2016.

The audit examination was carried out between May and August 2016 and consisted of scrutiny of the Board of Inquiry Reports pertaining to Ships/Submarine accidents. This was followed up by audit scrutiny of relevant records at IHQ MoD (Navy) (DGNO)<sup>2</sup> and three Naval Commands at Mumbai, Visakhapatnam and Kochi. The records of Safety Class Authorities

---

<sup>1</sup> The details of accidents of Naval Ships/Submarines during each year of the 11<sup>th</sup> Plan and first three years of 12<sup>th</sup> Plan as provided by Ministry of Defence to the Parliamentary Standing Committee on Defence (2014-15) and those accidents which occurred thereafter till March 2016 were selected by Audit for detailed study.

<sup>2</sup> DGNO – Director General Naval Operations.

of ships (FOST<sup>3</sup>, Kochi) and submarines (FOSM<sup>4</sup>, Visakhapatnam) were also selected for detailed audit scrutiny.

### **3.1.1.2 Organisational structure**

Prior to October 2012, the Indian Navy had no centralised and institutionalised framework for tackling safety issues but had a rather fragmented and compartmentalized setup to deal with these issues. Although, the Indian Navy Safety Organisation was promulgated in October 2012, yet it was setup in February 2014. The present setup involves multiple agencies at IHQ MoD (Navy), Naval Commands, Fleet, Flotilla, Squadron and onboard ships and submarines as indicated in paragraph 3.1.3.

### **3.1.1.3 Genesis of Accidents**

During the period from 2007-08 to 2015-16<sup>5</sup>, a total number of 38 accidents occurred, which led to a loss of 33 lives<sup>6</sup> of service officers/sailors as given in the Table-3.1 below:

**Table-3.1: Year-wise accidents of Indian Navy Ships/Submarines**

<b>Year</b>	<b>Number of Accidents</b>	<b>Loss of Life (Officers)</b>	<b>Loss of Life (Sailors)</b>
<b>2007-08</b>	06	01	05
<b>2008-09</b>	04	-	-
<b>2009-10</b>	04	-	01
<b>2010-11</b>	03	-	-
<b>2011-12</b>	02	-	-
<b>2012-13</b>	02	-	-
<b>2013-14</b>	12	06	15
<b>2014-15</b>	05	01	04
<b>2015-16</b>	-	-	-

<sup>3</sup> FOST – Flag Officer Sea Training who conducts operational sea training through three teams located at Kochi, Mumbai and Visakhapatnam.

<sup>4</sup> FOSM – Flag Officer Submarines who is also the Assistant Chief of Naval Staff (Submarines) based at IHQ MoD (Navy), New Delhi and is responsible for overseeing all submarine related issues.

<sup>5</sup> Status of accidents occurred subsequent to March 2016 and BoIs thereof has been called for and is awaited (March 2017)

<sup>6</sup> Loss of civilian lives in Naval Ship accidents was enquired, the information is awaited (March 2017)

Indian Navy lost two naval ships (INS Vindhyagiri and TRV A-72) and one submarine (INS Sindhurakshak) in these accidents. Of these accidents, the maximum number, viz., 12 occurred during 2013-14 followed by six in 2007-08, five in 2014-15 and four each in 2008-09 and 2009-10. The nature of accidents is as given in the Table 3.2 below:

**Table-3.2: Nature of accidents**

Year	Collision		Fire/explosion/flooding		Touching of bottom/grounding		Others		Total		Grand Total
	Ships	Subs	Ships	Subs	Ships	Subs	Ships	Subs	Ships	Subs	
2007-08	-	01	-	-	03	-	02	-	05	01	06
2008-09	-	-	-	01	02	-	01	-	03	01	04
2009-10	01	-	01	01	-	-	01	-	03	01	04
2010-11	02	-	01	-	-	-	-	-	03	-	03
2011-12	-	-	02	-	-	-	-	-	02	-	02
2012-13	-	-	01	01	-	-	-	-	01	01	02
2013-14	01	-	03	02	-	-	05	01	09	03	12
2014-15	01	-	02	-	01	-	01	-	05	-	05
2015-16	-	-	-	-	-	-	-	-	-	-	-
<b>Total</b>	<b>05</b>	<b>01</b>	<b>10</b>	<b>05</b>	<b>06</b>	<b>-</b>	<b>10</b>	<b>01</b>	<b>31</b>	<b>07</b>	<b>38</b>

*Subs-Submarines*

Out of 38 accidents, 15 (39 per cent) occurred due to fire/explosion/flooding, six cases (16 per cent) of vessels touching the bottom, another six accidents (16 per cent) were caused by collision of vessels and remaining 11 (29 per cent) were of miscellaneous nature which included accidental stranding and suspended movements, venting of poisonous gas, damages to sonar while docking and damage to aircraft hangar onboard the vessel, etc.

#### **3.1.1.4 Causes of accidents**

Naval accidents were mainly attributable to the following causes by the Indian Navy:

- **Crew error/non-compliance of Standard Operating Procedure**

Crew error includes non-compliance of Standard Operating Procedure (SOP)<sup>7</sup> and organisational/system failure,<sup>8</sup> errors in basics of navigation and ship

<sup>7</sup> Every evolution/activity of ship operations is governed by laid down SOPs, which are quite comprehensive and voluminous in nature. The total number of SOPs in force in Indian Navy relating to various activities of ship handling and handling of weapons, equipment, ammunition, etc. has been called for from IHQ MoD (Navy) and is awaited (March 2017).

<sup>8</sup> Ship Organisation- A group of dedicated Officers/personnel onboard a ship tasked to perform a specific duty.

handling such as not maintaining planned track in pilotage waters<sup>9</sup>, non-selection of appropriate head marks, failure to maintain a proper look out by radar and other means, not using all available means for risk assessment, over reliance on technology by relegating the time-tested methods of maintaining a good visual watch of ships and objects, etc.

- **Material failure**

Material failure is a state or condition of not meeting the desirable objective of a material or equipment. It includes poor fatigue strength of the hull due to vintage of the vessel, failure of steering gear, non-functional battery monitoring system, non-functional fire and flood alarm systems, unreliable AIS<sup>10</sup> Interface, limitations of Radar Interface with ECDIS<sup>11</sup> etc.

- **Electrical short circuit/Electrical fire**

An electrical short circuit is an abnormal connection between two nodes of an electric circuit intended to be at different voltages. This results in an excessive electric current and potentially causes circuit damage, overheating, fire or explosion.

- **Non-carrying out of dredging**

Dredging is an excavation activity usually carried out underwater, in shallow seas with the purpose of gathering up bottom sediments and disposing them at a different location. This technique is often used to keep waterways navigable.

Indian Navy attributed 27 out of 38 accidents to crew error/non-compliance of SOP/Organisational failure, five accidents on account of material failure, whereas three accidents each due to electrical short circuit and other factors as depicted in the chart below:

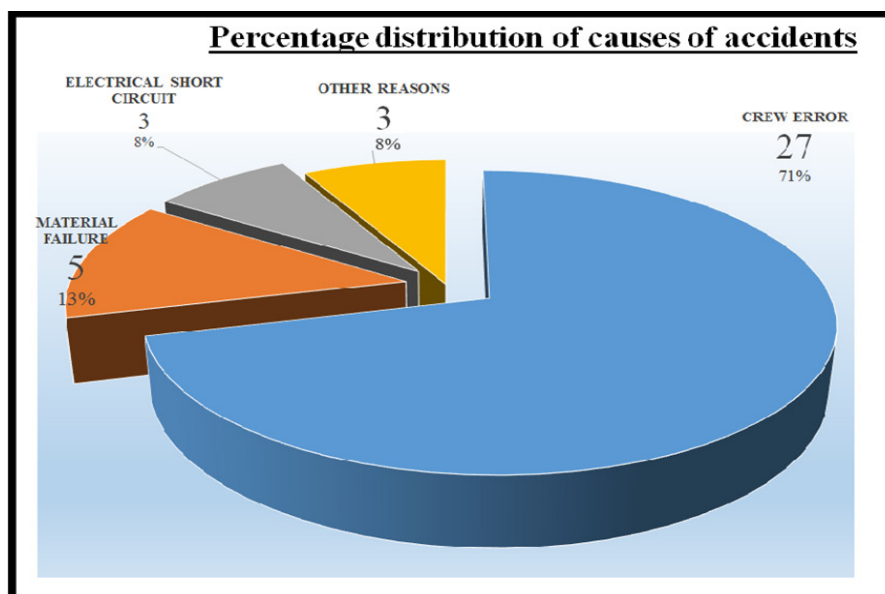
---

<sup>9</sup> Pilotage water is navigating using fixed points of reference on the sea usually with reference to a nautical chart to obtain the position of the vessel.

<sup>10</sup> AIS – Automatic Identification System

<sup>11</sup> ECDIS – Electronic Chart Integrated Display System

Figure 3.1: Distribution of causes of accidents in percentage



### 3.1.1.5 Major ship accidents

All Naval Ship and Submarine accidents are required to be investigated by convening a Board of Inquiry (BoI). The proceedings of such BoIs are classified as confidential documents. Though Indian Navy has not classified/categorised the ships/submarine accidents as discussed in paragraph 3.1.5.1, yet, some accidents involving loss/severe damages to ships, submarines, equipment and loss of lives are discussed in the succeeding paragraphs:

#### (i) Loss of INS Vindhyagiri

INS Vindhyagiri was a Nilgiri Class Warship (Frigate)<sup>12</sup> of the Indian Navy originally costing ₹71.69 crore and was commissioned in July 1981.

The ship suffered a collision with a merchant ship on 30 January 2011 while entering Mumbai harbour. The catastrophic fire and flooding that ensued caused the ship to submerge and come to rest on the mud bottom at sea. The BoI found that flooding and major fire subsequent to collision, lack of expertise in fire-fighting, non-availing the services of civil fire brigade and

<sup>12</sup> Frigate is a class of warships used to protect other warships and merchant-marine ships, especially as Anti-submarine Warfare combatants for amphibious expeditionary forces, underway replenishment groups and merchant convoys.

lack of coordination between Headquarters Western Naval Command (HQ WNC), Naval Dockyard and ship staff, as the major causes for loss of the ship. After a prolonged salvage operation by Naval Dockyard Mumbai, the ship was refloated and dry docked in July 2011. Subsequent to this, the Board assessed the damage and opined (August 2011) that the ship was beyond technical and economic viability for further operation. The ship was finally decommissioned in July 2012.

HQ WNC intimated to Audit (July 2016) that a large number of old fire tenders had been replaced after the accident and the decision not to seek assistance from outside agencies might have been taken by competent authority depending on the situation at that point in time and cannot be commented upon now.

**(ii) Capsizing of TRV A-72 with loss of lives**

Torpedo Recovery Vessel (TRV) A-72 of the Indian Navy, primarily used for recovery of torpedoes fired from other ships/submarines, with an original cost of ₹1.41 crore and a designed life of 20 years, was commissioned in February 1983. Based on the recommendations of four different Life Extension Boards, the service life of the vessel was progressively extended till 2017 by IHQ MOD (Navy). As of November 2014, the vessel had rendered 31 years of service life and while on the return passage to Visakhapatnam after participating in an exercise involving torpedo firing at sea, the vessel capsized. Five out of 29 personnel onboard could not be rescued.

The Board of Inquiry (November 2014) concluded that the immediate cause of loss was flooding and foundering and that the vessel during her extended service life (155 *per cent* of designed life) could have suffered fatigue failure and the fatigue stresses weakening the hull.

Indian Navy intimated Audit (August 2016) that the proposal for refinement of the material assessment process with greater focus on 'fatigue strength' was under deliberation.



**(iii) Accidental venting of poisonous Gas in INS Jalashwa**

INS Jalashwa, an amphibious landing platform dock<sup>13</sup> originally commissioned as USS Trenton in the US Navy in March 1971, was procured from the USA in 2005 at a cost of MUSD 50.63 (₹202 crore) and commissioned as INS Jalashwa in the Indian Navy in June 2007.

An accidental leakage (February 2008) of hydrogen sulphide gas from the collect-hold-transfer(CHT)/sewage compartment of INS Jalashwa occurred during a naval exercise which led to loss of six personnel. A Board of Inquiry attributed (February 2008) lapses relating to safe working practices, non-compliance of organisational procedures for record keeping, not undertaking essential maintenance routines and not sensitising/training of the crew to the accident.

**(iv) Collision of INS Airavat leading to propeller damage**

INS Airavat, a Shardul Class amphibious vessel of the Indian Navy was commissioned in January 2007. In January 2014, the ship collided with a civil boat and touched bottom, thereby damaging the port propeller. The BoI (February 2014) attributed the accident primarily to poor pilotage, which failed to establish the presence of a boat and assess the '*risk of collision*'. The BoI also found that the mandatory drills ('Work Up') had not been carried out even after two years of the due date (December 2012).

Indian Navy informed Audit (August 2016) that various constraints relating to operational commitments and capacity constraints of 'Work Up' teams precluded the execution of 'Work Up'.

**(v) Loss of INS Sindhurakshak**

INS Sindhurakshak costing ₹404.54 crore was a Russian made EKM submarine<sup>14</sup> commissioned in December 1999. The submarine met with an accident of explosion and subsequent sinking with loss of lives in August 2013.

---

<sup>13</sup> A landing platform dock is a warship that embarks, transports and lands elements of a landing force for expeditionary warfare missions.

<sup>14</sup> The functional role of submarines includes attacking surface and sub-surface vessels, laying offensive mine-fields, blockade of enemy posts, etc.

The BoI which investigated (August 2013) the circumstances leading to the accident initially appreciated various vulnerabilities/causes for likelihood of the accident. The reconvened Board, in February 2014 after scientific analysis and careful consideration, inferred leakage of oxygen from a torpedo as a primary initiator of the incident. The oxygen leak was attributed to material failure of oxygen flask or its associated pipelines.

The BoI proceedings also brought out that the operational deployment of the submarine in August 2013 by Indian Navy was not justified due to the following:

- The laid down Ships Operating Standards (SHOPS) for the submarine had not achieved the requisite Harbour and operational evolutions.
- Complete 'Work Up' of the submarine was not conducted when the submarine was prepared for operational deployment as the 'Work Up' was completed within one week instead of prescribed two weeks.
- The trials and calibration of Navigational aids and sensors should be completed prior to deployment of a submarine for 'Work Up' with any consorts. However, in the case INS Sindhurakshak, the Sea Acceptance Trials of two critical equipment were not completed even at the time of its preparation for operational deployment.
- Submarine authorities concerned did not properly assess the crew fatigue, besides, the submarine was holding ammunition nearing life expiry.

Indian Navy appraised Audit (July 2016) that as the acceptance trials are extremely stringent, the Sonar performance was improved by the combined efforts of the Sonar OEM, yard and ships staff in order to clear the acceptance trials. However, due to advent of monsoon the acceptance trials were not attempted as the sea state was appreciated to be beyond the limits laid down in the protocol. For inadequacies in completion of SHOPS, Indian Navy stated that with the submarine's sound material state, satisfactorily completing Task-II and accomplishing a torpedo firing, the inadequacy of not having completed SHOPS was not overwhelmingly weighing against embark on a deployment.

**(vi) Fire onboard INS Sindhuratna**

INS Sindhuratna is a Russian made EKM submarine commissioned in December 1988.

In February 2014, INS Sindhuratna, while undergoing 'Work Up', met with two incidents of fire leading to loss of life and heavy damage to the submarine. The submarine has not been operationalised so far and is currently under refit (June 2016) at Naval Dockyard, Mumbai.

Board of Inquiry which investigated the accident found the following:

- There was inadequate holding of ISP-60 set, necessary for safety of personnel during damage/fire control. Further, there were significant numbers of lagging cells<sup>15</sup> in the battery pit of the submarine, restricting the main motor propulsion.
- Even though the indicator buoy<sup>16</sup> had partial defects which were brought to the notice of Commodore Commanding Submarines (West) [COMCOS (W)] through the Sea State report, yet the submarine was put to sea with these defects in contravention of the provisions laid down by Indian Navy themselves in August 1996.
- Smoke and fire detectors were not installed in all compartments of the submarine for warning. There were two incidents of fire in the submarine within a span of two hours. The occurrence of two fire incidents in the same compartment of the submarine within a span of about two hours is indicative of the fact that in all likelihood, the first fire in the compartment was not extinguished completely.
- HQ WNC also had held (March 2014) that failure to detect the exact origin of smoke at the first instance coupled with failure of the concerned personnel to take a decision to terminate the ongoing task, *viz.*, 'Work Up' proved fatal and resulted in recurrence of fire and death of two officers.

---

<sup>15</sup> Lagging cells: If only one of the cells in a battery discharges earlier than the other, the efficiency of the battery will be determined by this cell. Such a cell limits the capacity of the battery because, during discharge, its voltage will drop to the final value ahead of any of the other cells and is called a lagging cell.

<sup>16</sup> Indicator buoy: It is a communication equipment (emergency transmitter) which indicates a submarine in distress at a recoverable depth.

The origin of first fire could not be conclusively identified nor the consequences of such a fire were properly appreciated despite the presence of senior officers/submarine experts.

Audit noticed (August 2016) that the relevant Navy Order stipulates that the selected members of a Board of Inquiry should not have any direct or indirect interest in the matter under inquiry. The BoI pertaining to Submarines is to be, *inter alia*, analysed by the Flag Officer Submarines (FOSM) being Class Authority from the professional or technical aspects. However, HQ WNC (February 2014), in violation of extant orders, constituted a BoI to investigate into the circumstances leading to accident of INS Sindhuratna, which consisted of officers linked to the accident in one way or the other. The President of the Board was FOSM himself, the Safety Class Authority of Submarines.

As regards appointment of FOSM as President of the BoI, Indian Navy stated (August 2016) that the same was a considered decision at HQ WNC in accordance with the provisions contained in the Navy Regulations and the members of the BoI had no personal interest in the subject accident.

**3.1.1.6** In the Action Taken Report on the recommendations of the Parliamentary Standing Committee on Defence (2014-2015) (Eighth Report), Ministry had stated (April 2015) that all cases of accidents are investigated by a Board of Inquiry and lessons learnt from the reports of BoIs are implemented appropriately. Further, the Ministry in the Action Taken Report on the recommendations of Parliamentary Standing Committee on Defence (2015-16) (Sixteenth Report) has stated (February 2016) that a number of steps have been taken by the Indian Navy to ensure strict adherence to the laid down SOPs and precautionary measures for various evolutions, which include assessment of adherence to laid down SOPs by Flag Officer Sea Training (FOST)/respective Commanders-in-Chief and inspection of all operational units annually by Operational Authorities.

## **Audit Findings**

The inadequacies noticed by Audit in measures taken by the Indian Navy in prevention of accidents are discussed in the succeeding paragraphs:

### **3.1.2 Inadequacies in implementation of recommendations of Boards of Inquiry**

Most of the recommendations made by the Boards of Inquiry emphasized the need for strict adherence to the existing Standard Operating Procedures. The Boards also made certain generic recommendations such as emphasis to be laid on compliance with the provisions of International Regulations for Prevention of Collision at Sea (IRPCS), regular inspection of Stern Gland<sup>17</sup> for excessive water ingress, adherence to norms of keeping watertight doors and hatches closed, thorough exercises in using volumetric markings during flooding exercises, completion of hull surveys without gaps, incorporation of Personal Locator Beacons (PLB) on lifejackets, issue of cautionary regarding limited sea room available in channels, installation of commercially available Voyage Data Recorder, cultivation of a seaman's eye, etc. in respect of surface ships. As regards submarine accidents, the BoIs broadly recommended conduct of 'Work Up' in a systematic manner with sequential exercises adhering to the laid down duration, ensuring presence of key personnel during conduct of 'Work Up' together with bifurcation of Inspecting Authority from Operational Authority, procurement of sufficient personal breathing apparatus, installation of smoke/ fire detectors, setting up of Damage Control Simulator, fixing of residual life of articles onboard submarines at least three months prior to proceeding on patrol, etc.

There were a total of 382 BoI recommendations in respect of 28 ships and 7 submarine accidents<sup>18</sup> examined by Audit. Audit enquired the status of implementation of these recommendations. However, Indian Navy gave specific reply on the status of implementation of only 124 recommendations in

---

<sup>17</sup> Stern gland is a long shaft known as the propeller shaft used for connecting a ship's engine with the propeller.

<sup>18</sup> The records of BoI recommendations in respect of remaining three accidents were not readily available.

respect of eight ship accidents and two submarine accidents wherein 81 recommendations (*i.e.*, 21 *per cent* of the total recommendations) were fully implemented. This is primarily due to non-existence of an institutionalised mechanism in the Indian Navy for ensuring implementation of recommendations made by various BoIs.

Some of the recommendations which were not implemented are:

- Provision of protective clothing for fire-fighting and filling up of vacancy of Civilian Fire Officer at Naval Dockyard, Mumbai.
- Provision of Aqueous Film Forming Foam <sup>19</sup> to ships through tanks and pipes for fire-fighting in jetties and upgradation of Fire-Fighting Training Units at Naval Dockyards to the level of advanced Navies.
- Revision of authorisation of suction hoses for Drain Discharge pumps in all ships.
- Installation of smoke and fire detectors in all compartments of submarines and procurement of extended line breathing apparatus (ELBA) sets, Carbon composite submarine breathing apparatus (SBA), Light weight breathing sets for submarines.
- Positioning of separate Squadron Anti-Submarine Warfare Officers for each class of submarine at submarine commands.

### **3.1.3 Inadequacies in measures for prevention of accidents**

#### **3.1.3.1 Delayed creation of IN Safety organisation.**

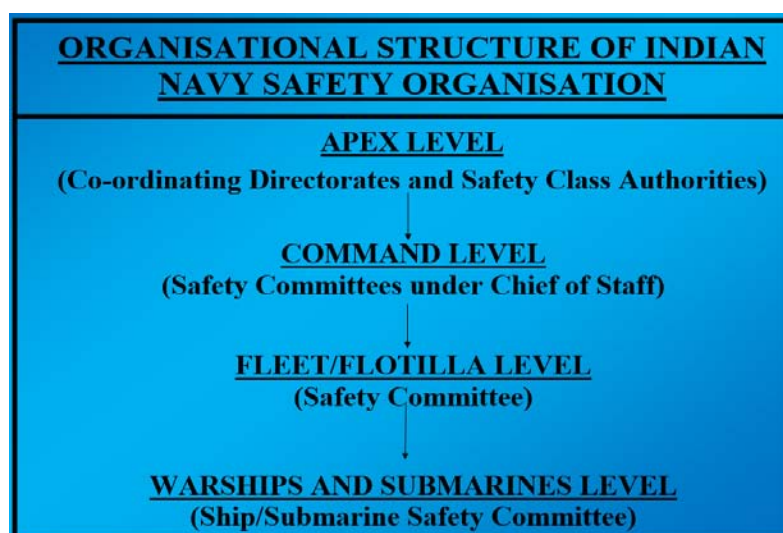
The ambit of safety issues onboard surface ships includes cargo operations, boat/craft operation, rope-work, anchoring, mooring and towing, helicopter operations, working over the side/aloft and in dry dock, electrical safety, shipboard POL safety, weapon/ordnance safety, etc. The US Navy, Royal Australian Navy and Republic of Singapore Navy have separate and dedicated safety organisations. The Indian Air Force has a dedicated Directorate (Directorate of Flight Safety) which formulates flight safety policies and deals with reporting and investigation of accidents. The Indian Navy, however,

---

<sup>19</sup> Aqueous Film Forming Foam is the most common technology currently used in fire-fighting.

since inception, had no centralized and institutionalised framework, but had a rather fragmented and compartmentalized set up, to deal with safety issues. The idea of creating an IN Safety Organisation was mooted in 2006 and ultimately promulgated in October 2012. It was set up in February 2014, although it is yet to be sanctioned by Government. The existing organisational framework is indicated in the chart below:

**Figure 3.2- Organisational structure of Indian Navy safety organisation**



The duties and responsibilities of various authorities and committees of the Safety Organisation were defined and the frequency of the safety meetings to be conducted at Fleet/Flotilla/Squadron level and onboard ships was stipulated. The details are tabulated below:

**Table-3.3: Duties of various authorities of the Safety Organisation**

Authority	Duties and responsibilities	Periodicity of safety meetings
IHQ, MoD (Navy) • Directorate of Naval Operations • Directorate of Submarine Operations	As the apex level authority, to liaise with Safety Class Authorities, viz., FOST and FOSM	Not specified
Three Naval Commands	Single point authority to coordinate safety related aspects with the Safety Class Authorities at the Command level	Not specified
Fleet/Flotilla/Squadron	Conduct Safety Committee meetings at Fleet/Flotilla/Squadron level	Quarterly
Individual Ships	Conduct 'Ship Safety Committee' meetings onboard	Quarterly

Commencing 01 July 2013, Commands and Safety Class Authorities were to forward a half yearly feedback on the effectiveness of the measures implemented for enhancement of safety to IHQ MoD (Navy)/DNO. The feedback was to include recommendations for making the structure more robust with regard to developing 'Safety Culture' in the Indian Navy. Subsequently in February 2014, Command Level Safety Audit Team (COMSAT) and Operational Authority Level Safety Audit Team (OLSAT) were introduced with the stipulation that every ship has to undergo either OLSAT audit or COMSAT audit once in a year.

Audit scrutiny (June 2016 to August 2016) of the implementation of the above institutionalised mechanism of IN safety organisation revealed the following shortcomings:

- There was abnormal delay of two and a half years in institutionalising the Indian Navy Safety Organisation at Headquarters Western Naval Command. The full-fledged Command Safety Committee Meeting to be chaired by the Chief of Staff, scheduled for December 2012 was actually held only in May 2015, without any apparent reasons.
- HQ Southern Naval Command, Kochi was unable to furnish the minutes of the safety committee meetings for audit scrutiny. They, however, stated that even more elaborate and effective methods were also in place. However, in the absence of recorded minutes, Audit does not have any assurance about the adequacy of safety measures taken by the Command.
- While a dedicated Command Safety Officer for Eastern Naval Command was appointed in November 2014; for Southern Naval Command in May 2016, the Western Naval Command continues to function without a dedicated Command Safety Officer so far. The duties of Command Safety Officer at HQ WNC, Mumbai are being performed by the Command Submarine Officer which is in variance with Indian Navy's policy on the issue.
- Though Flag Officer Sea Training (FOST) has been designated (October 2012) as the Safety Class Authority for surface ships and all ships have



been directed to render minutes of Quarterly Safety Meeting to FOST, the ships were not reporting (May 2016) the proceedings of the safety meetings as per the stipulated timeliness. Further, the ships were not reflecting safety infringements, near misses and incidents/accidents in true spirit, thereby, precluding promulgation of Safety Advisories for all ships/concerned units.

- A ship should be cleared for operation at sea with all safeties in place, however, there is no extant system of safety certification in the Indian Navy, in as much as, a ship after being commissioned or after completing her refit does not have a mandatory certification by concerned authorities/trial agencies.
- There is no database of safety related incidents in the Indian Navy to analyse the causes *viz.*, material failure, unsafe practices, bad weather etc. Many a 'Near-Miss' incidents onboard ships go unreported for fear of backlash.

In response to audit queries, Indian Navy stated (June 2016) that like any fledgling organisation, it took a finite time for implementation and settling down, understanding of roles and responsibilities at each level and formalisation of policies, procedures and a rugged framework for executing/monitoring. Indian Navy also stated (October 2016) that there were deliberations at IHQ MoD (Navy) on the issue of creation of a safety organisation in the Indian Navy since 2006 and a consensus was reached (2007) that existing measures were sufficient.

Thus, there was inordinate delay in creation of safety organisation and even after promulgation of policy for the creation of the organisation the same has not been implemented fully.

### **3.1.3.2 Shortcomings in the working of COMSAT/OLSAT**

Based on the promulgation of IN Safety Organisation in October 2012, Command Level Safety Audit Teams (COMSAT) were constituted under the Command operational authorities and Operational Authority Level Safety Audit Team (OLSAT) were constituted under the Fleet operational authorities.

The Presidents of COMSAT and OLSAT are to report their observations to Administrative Authority (Command HQs), keeping IHQ MoD (Navy) informed. Thereafter, the Command HQs are to signal to IHQ MoD (Navy) the way ahead to address these observations resulting in a situation where the auditor (Command HQs) is also effectively the auditee.

Further, the Safety Audits are required to be undertaken by Commands and Operational Authorities from within available manpower resources, which are already stretched, on account of existing shortages.

Audit noticed (July 2016) from the inputs from the field units regarding safety audit that the desired aim of achieving enhanced safety in operations has not been achieved primarily due to non-availability of suitably qualified manpower to conduct the audits. These audits are being conducted with manpower drawn from other ships/establishments under the command/operational authorities and thus an audit by higher authority has been largely reduced to 'peer level' audit.

Indian Navy in their reply stated (October 2016) that as part of streamlining of COMSAT/OLSAT, issues such as conduct of safety audits under the aegis of FOST, type and duration of safety audits and class of ship specific safety audit check lists were under deliberations at IHQ MoD (Navy).

Thus, even after four years of promulgation of IN Safety Organisation, the methodology of conducting the safety audits has not yet been streamlined.

### **3.1.3.3 Lack of manpower/expertise for analysis of accidents/incidents**

Flag Officer Sea Training (FOST) as Safety Class Authority for surface platforms is, *inter alia*, responsible for analysis of incidents, accidents and all safety infringements including 'near misses' for review, formulation and promulgation of acquants for dissemination of lessons learnt and policies with respect to safety in their specific domains after due approval of IHQ MoD (Navy). In October 2012, FOST was designated as the Safety Class Authority for surface ships, by IHQ MoD (Navy).

Audit observed (June 2016) that HQ FOST does not have the requisite

manpower/expertise to analyse all types of safety related accidents/incidents pertaining to various classes of ships. According to HQ FOST, training schools/establishments are best suited to undertake formulation of lessons learnt in view of availability of experienced specialist officers/sailors in almost all classes of equipment. Any rethinking on the role of FOST in this regard is not known, as HQ SNC had not replied convincingly to audit queries.

Audit further noticed (July 2016) that between 2012-13 and 2014-15 even though fifteen Naval Ship accidents took place, yet HQ FOST did neither undertake safety assessment of five<sup>20</sup> ships nor prepared any safety acquaints. FOST also did not promulgate safety BRs, safety orders and periodic safety updates etc.

Indian Navy stated (August 2016) that the manpower constraints have been taken into account by IHQ MoD (Navy) while formulating the policy on IN Safety Organisation. However, the contention is not correct as evident from the fact that the core duty of FOST, *viz.*, conducting 'Work Up', is affected by shortfall of manpower as discussed later. As regards inaction by FOST in preparation of Safety Assessment and Acquaints, Indian Navy stated (August 2016) that out of the five accidents indicated by audit, approved BoIs in respect of three accidents were received by FOST in July 2016 and the same were under detailed study and safety advisories would be issued subsequently. Thus, without addressing the issues of manpower/expertise shortage, designating FOST as the Safety Class Authority for surface ships is considered imprudent.

#### **3.1.3.4 Non-promulgation of safety equipment allowance list**

A need was felt by Indian Navy (2014) that there has to be a standard safety equipment allowance list to be promulgated all over Indian Navy for use onboard ships. Accordingly, HQ Flag Officer Sea Training (March 2014) proposed a Safety Equipment Allowance list indicating various safety equipment to be used onboard ships, however, the standardised safety equipment allowance list across Indian Navy is yet to be promulgated.

---

<sup>20</sup> INS Airavat, INS Talwar, INS Kuthar, INS Kora and INS Cheetah

Besides, the ships were unable to demand the equipment as per the proposed allowance list, as approval of IHQ MoD (Navy) was awaited. Owing to non-promulgation of the safety equipment allowance list, procurement of these safety equipment is being processed by individual ships leading to induction of equipment of various make and quality.

Indian Navy in their reply stated (June 2016) that the approval of the Safety Equipment Allowance List is at final stages at IHQ MoD (Navy) and further directives regarding procurement of the same would be issued at the earliest.

Thus, IHQ MoD (Navy) has not taken a final decision on promulgation of Safety Equipment Allowance List even after two years of projecting the requirements by the Safety Class Authority.

#### **3.1.3.5 Failure to carry out mandatory drills**

The concept of 'Operational Sea Training' (OST) commonly referred to as 'Work Up' has evolved from the requirement to hone the skill of ship's crew to the requisite operational standard. The 'Work Up' of a ship, carried out under the overall supervision of Flag Officer Sea Training (FOST), Kochi ensures a comprehensive and systematic progression of the ship to achieve the prescribed performance standards to undertake the designed role and streamline ship management in totality. Further, the equipment and machinery status is also evaluated during the 'Work Up'. At the end of each 'Work Up' schedule, FOST is required to conduct an operational readiness assessment at sea and certify the ship's operational status highlighting the areas that need continuation training/attention. Timely 'Work Up' of a ship is, therefore, of paramount importance in ensuring crew proficiency and efficient overall ship management.

Extant Navy orders, *inter-alia*, stipulate that a ship is due for 'Work Up' on commissioning (after Part IV<sup>21</sup> trials are completed); after Normal Refit (NR);

---

<sup>21</sup> Part IV trials- Part IV trials are the last phase of trials that happen post acceptance and commissioning of the Ship. Throughout these periods setting to work, testing and tuning of weapon systems, outstanding Harbor Acceptance Trials/Sea Acceptance Trials are completed and accepted by the Navy in the presence of the OEMs.

after Short Refits to ship, which are for any reason extended to a period as long as that of NR for that class of ship and also 24 months after the last ‘Work Up’ of a ship.

There was heavy shortfall *vis à vis* the number of ships due for ‘Work Up’ and actually carried out by FOST, Kochi, in respect of entire naval fleet, from the year 2011-12 onwards. The details of ‘Work Ups’ prior to 2011-12 were not readily available with the Indian Navy. The details are tabulated below:

**Table-3.4: Details of ‘Work Up’ conducted**

<b>Year</b>	<b>‘Work Up’ due</b>	<b>‘Work Up’ conducted</b>	<b>Percentage shortfall</b>
<b>2011-12</b>	86	39	55
<b>2012-13</b>	92	36	61
<b>2013-14</b>	91	34	62
<b>2014-15</b>	98	21	79
<b>2015-16</b>	110	29	74

It can be seen from the table above that there were serious shortfalls in ‘Work Up’ carried out, when compared with the Ships due for ‘Work Up’ and number of ships which underwent ‘Work Up’. Further, there was a downward trend in the number of ‘Work Ups’ carried out by FOST, Kochi between 2011-12 and 2015-16.

Further, 10 ships which were commissioned in the Indian Navy since October 2011 had not undergone the mandatory ‘Work Up’ as of August 2016. These ships include Indian Navy’s only aircraft carrier in operation, *i.e.*, INS Vikramaditya, which was commissioned in November 2013.

Audit observed (August 2016) that out of a total number of 30 ship accidents, which occurred from the year April 2007 to March 2014, ‘‘Work Up’’ was not conducted in due time in respect of 16 ships. The details are given in Annexure-VI.

Indian Navy stated (August 2016) that the primary reason for shortfall in achieving the ‘‘Work Up’’ targets is the existing ‘Work Up’ capacity *vis à vis* the requirements. With the growth of Indian Navy, the operational sea training

(‘Work Up’) requirement has also increased. However, ‘Work Up’ capacity has remained constant.

Thus, there is acute shortage in conducting ‘Work Up’, which is an important mandatory drill ensuring the safety of the crew and ships at sea. Indian Navy has not been able to provide any concrete plans to increase the ‘Work Up’ capacity.

### **3.1.3.6 Ineffective monitoring mechanism for liquidation of material issues**

On completion of OSTs (“Work Up”) the ship staff gives detailed feedback/way ahead to Operational Authority/Command Headquarters for liquidating outstanding observations. The same has to be monitored periodically at Commands till their liquidation.

Audit scrutiny (July 2016) of annual ‘Work Up’ reports prepared by FOST revealed that a large number of material issues are persisting/pending in many ships. Some of the issues which directly impinged safety onboard the ships pending are Harbour Acceptance Trials (HATs)/Sea Acceptance Trials (SATs) of newly fitted/overhauled equipment onboard most ships; sub-optimal performance of emergency communication systems; non-fitment of Flood Sensors and Alarm systems, etc. In response to our queries, HQ Southern Naval Command stated (August 2016) that they were not aware of the status of liquidation of these observations.

It indicates that the monitoring mechanism for liquidation of serious material/equipment failure issues, raised by FOST, was not effective/ efficient. This fact is validated by non-functional flood and fire alarm system onboard INS Agray as discussed below:

The Board of Inquiry which investigated into the circumstances leading to the incident of fire onboard INS Agray in July 2009 found that the Flood and Fire Alarm System onboard the ship was not functioning. HQ WNC, while analysing the BoI proceedings pointed out (April 2010) that from the emergencies that had occurred in the past, the fire and flood alarm systems

onboard ships had not been of any aid in detecting the crisis. It was also pointed out that the Fire Detection System's SOTR,<sup>22</sup> themselves, were not very exhaustive. In response to an Audit query (June 2016) on the review of SOTR and induction of new systems, Indian Navy stated (July 2016) that IHQ MoD (Navy) had issued (February 2011) policy directives for induction of Addressable Automatic Fire Detection System (AAFDS) in lieu of the existing AFDS system. Similarly, policy directives for induction of Addressable Flood Alarm System (AFAS) were issued in April 2012 in lieu of the existing Flood Alarm Systems. Revised SOTRs for AAFDS and AFAS were promulgated in December 2015 and January 2016 respectively. However, the induction of these systems was at the initial stage of procurement.

Thus, there was inordinate delay in induction of critical fire and flood alarm systems impinging on safety onboard ships.

### **3.1.4 Training related issues**

#### **3.1.4.1 Deficient study and analysis of incidents/accidents by Collision and Grounding Analysis Cell**

A Collision and Grounding Analysis Cell (CAGAC) was formed at Navigation and Direction (ND) School, Kochi in 2005 for analysis of navigational incidents and dissemination/incorporation of lessons learnt from the same. On receipt of Board of Inquiry proceedings at IHQ MoD (Navy), the same is examined by the professional directorates there and the cases meriting inclusion as case studies are sent to CAGAC for analysis and further dissemination of lessons learnt from the same. The cell received a compendium of navigational incidents from IHQ MoD (Navy) till early July 2006 which included narrative, analysis and lessons learnt. From the year 2007-08 onwards, a total number of five collision and six grounding accidents of ships took place, however, only one incident relating to the grounding of a ship in early 2008 was received by the cell. The cell had no information about

---

<sup>22</sup> SOTR- Statement of Technical Requirements

remaining cases of collision/grounding by Indian Navy ships/submarines. As CAGAC bears significant potential for assisting improvement of navigational training and safety, it is imperative that the Cell is provided with full Board of Inquiry proceedings of all accidents. In response to an Audit observation (June 2016) relating to non-receipt of BoI extracts by CAGAC, HQ Southern Naval Command stated (June 2016) that IHQ MoD (Navy) forwards the appropriate information for updation of records of CAGAC and that ND School was provided with the latest compendium of BoI/advisories in 2007 which had 30 case studies and another 22 case studies were provided from 2009-15. But no documentary evidence was furnished to Audit for verification.

Similarly, NBCD School, Lonavala which imparts Nuclear, Biological and Chemical Defence (NBCD) training and having a role in NBCD policy formulation, study of NBCD problems, formulation of appropriate NBCD standards, conduct of user trials of NBCD equipment, etc. had received the last incident report from IHQ MoD (Navy) in September 2011.

In reply to audit queries, IHQ MoD (Navy) stated (October 2016) that NBCD Directorate at IHQ has commenced forwarding of BoI extracts to NBCD School. However, the reply was silent on the gap from September 2011 to October 2016. Thus, non-forwarding of BoI extracts/information on BoI proceedings, in time, is indicative of the fact that the lessons learnt from the accidents are not being analysed and disseminated by these cells timely.

#### **3.1.4.2 Need for dedicated survival and rescue training**

It emerged from the lessons learnt from the sinking of Torpedo Recovery Vessel TRV A-72 off Visakhapatnam in 2014 that survival training and abandon ship training is carried out in the Indian Navy as part of Operational Sea Training (OST) and covers only ships undergoing OST and individuals get exposure sporadically during their service life only when being posted to such a ship. An independent school with comprehensive facilities dedicated only to sea survival, rescue/recovery and Search and Rescue (SAR) was



proposed (November 2014) by Flag Officer Commanding Eastern Fleet. The school was envisaged to cover intensive survival training and abandon ship drills in a three to four day for all Indian Navy personnel, however, there is no progress on the issue of creating a dedicated school for survival and rescue training.

#### **3.1.4.3 Inadequate number of NBC Instructors at Indian Naval Academy**

Audit observed (July 2016) that Indian Naval Academy (INA), Ezhimala, the *ab initio* officers training academy of the Indian Navy, functions with a sanctioned strength of only one Nuclear, Biological and Chemical Defence (NBCD) Control Instructor against a projected requirement of two specialist NBCD Officers and five Sailors (Instructors).

Due to shortage of NBCD qualified instructors, NBC classes are conducted by officers engaged in other duties. Any shortage of instructors has direct and proportional impact on training. Lack of dedicated NBCD Officer and NBCD Instructor in training establishment like the INA precludes any enhancement of training material which adversely affects the revamped curriculum and training output.

In their reply to audit queries, HQ SNC (August 2016), however, denied having any adverse impact on training due to shortage of NBCD instructors. The reply of HQ SNC is not tenable for the reason that it is during *ab initio* training that the safety culture first gets inculcated in a cadet. Moreover, as stated by INA Ezhimala, *ab initio* training is instructor intensive and any shortage does adversely impact the training.

#### **3.1.5 Other Miscellaneous issues**

##### **3.1.5.1 Non-classification of accidents**

Accident classification is a standardised method by which the causes of an accident, including the root causes, are grouped into categories. By analysing a classification of accidents, an organisation can cover as many aspects as

possible *i.e.*, human performance, organisational issues, technological issues and also to understand the magnitude of the accident in terms of the losses.

Audit observed (June 2016) that Indian Navy has so far not classified/categorised the ship/submarine accidents for the purpose of analysis. Audit further observed that armed forces in other countries like United States and also Indian Air Force are classifying accidents into various categories for better analysis.

In their reply to audit queries, Indian Navy stated (July 2016) that as per extant policies on the subject, accidents are not classified into categories, however, all contributory aspects are brought out and analysed in Boards of Inquiry.

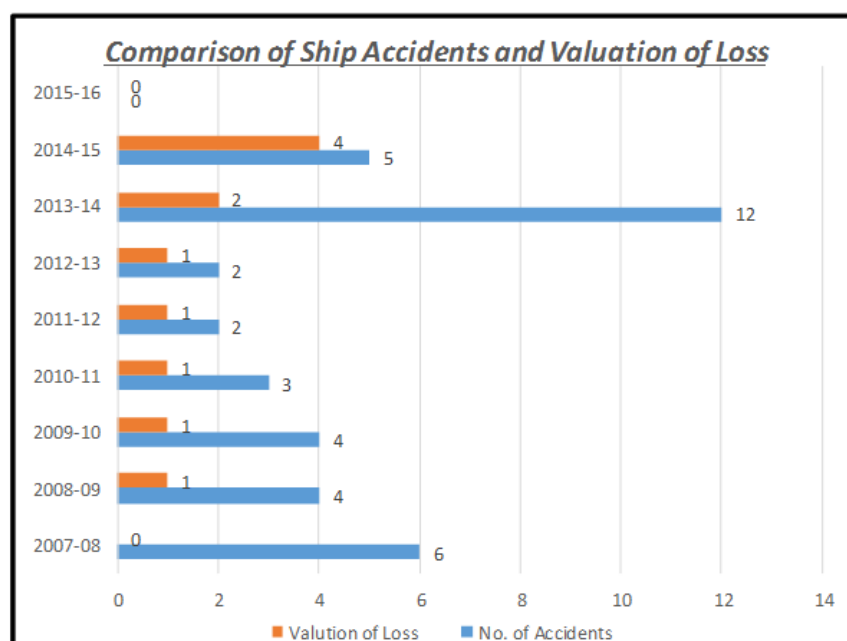
Notwithstanding the above, Audit, however, considers that a proper classification of accident is beneficial in analysing the accidents with reference to its magnitude and financial implication.

#### **3.1.5.2 Non-assessment of loss by BoIs**

As per the extant orders, in cases of major losses of stores due to enemy action, collision, grounding and fire, loss statements are required to be prepared and loss is required to be regularised by Competent Financial Authority.

During the period 2007-08 to 2015-16, although Indian Navy reported 38 accidents, yet the BoIs assessed value of loss at ₹8.86 crore in respect of eleven accidents only which included two ships lost irretrievably, *viz.*, INS Vindhyagiri and TRV A-72. The value of loss for remaining 27 accidents was not assessed by BoI/Navy. The details are depicted below:

**Figure 3.3: Comparison of Ship accidents and valuation of loss**



Audit observed (August 2016) that the provisions laid down for preparation of loss statement and its regularisation had not been adhered to by the Indian Navy. Incidentally, Indian Navy initiated action for preparation of loss statements for loss due to accidents only after being pointed out by audit.

As regards action initiated for regularisation of loss, no comments have been offered by Indian Navy and IHQ MoD (Navy) stated (October 2016) that information had been sought from the Commands and a consolidated response would be forwarded; the same was awaited (March 2017).

### 3.1.6 Conclusion

The loss of a ship/submarine adversely affects the operational preparedness of the Indian Navy, as acquisition of new ships/submarines involves procurement/ construction process of more than eight to ten years. It is, therefore, imperative that Indian Navy maintains its assets free from accidents during peacetime evolutions. During the period 2007-08 to 2015-16, 38 naval ships and submarines met with accidents, wherein 33 trained naval personnel lost their lives in addition to their retrievable loss of three vessels. Accidents were attributable to crew error and material failure which was due to

shortfalls, ranging from 55 per cent to 79 per cent in carrying out of 'Work Up' of vessels.

There was no monitoring mechanism for implementation of recommendations made by various BoIs. Further, BoI had assessed losses in only eleven accidents, however, loss statement was not prepared in any of the accident unlike Indian Air Force. Indian Navy also did not classify the accidents keeping in view the magnitude/severity of the accidents.

The Indian Navy since inception, has no institutionalised framework to deal with safety issues. A dedicated organisation for dealing with safety issues was implemented by the Indian Navy only in 2014, however, it awaits Government's sanction. The Indian Navy Safety Organisation has been functioning sub optimally with various deficiencies including dedicated manpower.

### **3.1.7 Recommendations**

- ✓ *Present Indian Navy Safety Organisation is ad hoc in nature formed without approval from the competent authority. This needs to be institutionalised with proper sanction from the Government and dedicated manpower be allocated for its effective functioning.*
- ✓ *Ministry may ensure that there is an institutionalised mechanism in place for monitoring the implementation of BoI recommendations in a time bound manner.*
- ✓ *Ministry may ensure that there is no delay in forwarding the extracts of BoIs and dissemination of information of accidents to respective study centres so that the lessons learnt can be implemented timely.*
- ✓ *Ministry may ensure proper classification of accidents, on the basis of severity and financial implication, for better analysis of the accidents and its causes. BoI may categorise their proposed recommendations on the basis of priority for implementation.*
- ✓ *Immediate steps need to be taken to liquidate the constraints faced by Flag Officer Sea Training to ensure that 'Work Up' of ships are carried out in*

*time without any backlog.*

- ✓ *As majority of the accidents are attributable to crew error, Indian Navy may consider to have a relook at training syllabus and methodology.*

The matter was referred to the Ministry (December 2016); their reply was awaited (March 2017).

### **3.2 Functioning of Marine Gas Turbine Overhaul facility**

**INS Eksila is overhauling the M3E GTs since 1991, but continued to encounter abnormal delays in completion of the overhaul of the GTs, *inter alia*, due to non-availability of spares and manpower. The facility required for overhaul of M-15 GTs was yet to be completed though the facility had been planned to be set up since 1986. Meanwhile, two out of twelve 1241 RE class ships, which employ the M-15 GTs, had been decommissioned by April 2016. Overhaul facility for M-36 GTs planned in 2008, has also been delayed for want of synchronisation between civil works and procurement of equipment. Consequently, Navy continued to depend on OEM for overhaul of GTs, incurring an expenditure of ₹317.77 crore. INS Eksila is grappling with inadequate availability of technical expertise, due to non-retention of manpower for long duration.**

#### **Introduction**

**3.2.1** The overhaul facility for the marine gas turbine (*i.e.* M3E GTs<sup>23</sup>) was set up in October 1991 as Marine Gas Turbine Overhauling Centre (MGTOC) which was subsequently commissioned as INS Eksila, in August 2000, under the administrative control of Flag Officer Commanding-in-Chief, Headquarters Eastern Naval Command (HQ ENC), Visakhapatnam. INS Eksila is primarily tasked with capital repairs and overhauls of the Marine Gas Turbines (GTs) and Gas Turbine Generators (GTGs) fitted onboard Naval Ships as given below:

---

<sup>23</sup> M3E GTs are installed on five Rajput class ships of Indian Navy.

- To undertake major overhaul (OH) of Marine Gas Turbines (M3E GTs) and Gas Turbine Generators (GTGs) of Rajput class ships.
- To cater for major Overhaul (OH) of Cruise<sup>24</sup> and Boost<sup>25</sup> GT Aggregates<sup>26</sup> (M-15) of the 1241 RE class ships.
- To cater for major OH of Marine Gas Turbines (M-36E GTs) of the Delhi/Talwar class ships, and
- Be the repository and engine holding authority for M3E Marine Gas Turbine Engines in the Indian Navy.

INS Eksila has completed a total of 38 major overhauls since 1991 which includes 37 OH of M3E GTs, one OH of M-15 GTs and Nil OH of M-36 GTs.

### **Organisational Structure**

INS Eksila is headed by an officer of the rank of Commodore of Indian Navy, who functions under the administrative control of the Flag Officer Commanding-in-Chief, Eastern Naval Command, Visakhapatnam and technical control of the Principal Director of Marine Engineering (PDME)/Integrated Headquarters, Ministry of Defence, Navy {IHQ MoD (Navy)}.

### **Budget Management**

The total budgetary allocation under locally control heads *viz.*, repair of equipment, procurement of naval stores, procurement and upkeep of IT facilities etc. for INS Eksila during the last five years from 2011-12 to 2015-16 was ₹12.84 crore, against which there was an expenditure of ₹12.61 crore. The budgetary allocation does not include expenditure on capital procurements including overhaul spares, pay and allowances of officers, sailors and civilians etc., as these are budgeted separately for the entire Navy.

---

<sup>24</sup> Cruise GT - 1241 RE class ship have two Cruise Gas Turbines located in forward engine room. They are mostly employed onboard ships for cruising evolutions

<sup>25</sup> Boost GT - 1241 RE class ship have two Boost Gas Turbine located in Aft engine room. They are mostly employed onboard for high speed evolutions

<sup>26</sup> M-15 GT Aggregates –is fitted with two each cruise and boost marine gas turbines. Cruise GTs are used when the ship is in sailing and Boost GTs are used for adjustment of speed when the ship reaches the harbor/port.

### Manpower Position

The position of sanctioned and posted strength of manpower in INS Eksila during the last five years is tabulated in Table 3.5 given below:

**Table-3.5: Sanctioned and posted strength of manpower in INS Eksila**

Year	Officers			Sailors			Civilians		
	S	P	Def (in %)	S	P	Def (in %)	S	P	Def (in %)
2011	27	18	34	424	293	31	77	53	31
2012	27	16	41	424	266	37	77	51	34
2013	27	18	34	424	265	38	77	47	39
2014	27	18	34	424	277	35	77	51	34
2015	27	22	19	424	267	37	77	51	34

*S- Sanctioned, P-Posted and Def-Deficiency in percentage*

Deficiencies in posted strength exist in all cadres of INS Eksila. The deficiencies in sailors cadre, ranged between 31 and 38 *per cent* and civilians cadre ranged between 31 and 39 *per cent*.

### Audit Objectives

Audit was carried out to ascertain:

- the performance of INS Eksila in the overhaul<sup>27</sup> of M3E GTs,
- the capability of INS Eksila in the overhaul of M-15 and M-36 GTs,
- availability and utilisation of man power
- indigenisation/production of overhaul spares

### Audit Scope and Methodology

Mention was made in Paragraph No. 2.7 of C&AG Report No. 5 of 2008 (Air Force & Navy) for the year ended 31 March 2007 about 'Delay in creation of overhaul facilities in Eksila', wherein delay in establishment of overhaul facilities for M-15 GTs and its limited utility upon completion of the project in view of these GTs having already been overhauled and short residual life of the ships, were highlighted. In their ATN, Ministry stated (August 2010) that

<sup>27</sup> Since, the role and functioning of INS Eksila involves major overhaul of M3E, M-15 and M-36 GTs, all these were selected as Audit Objectives.

1241 RE class ships would remain in commission for another 15-20 years and the benefits accruing from the M-15 overhaul facility would be substantial.

The creation of overhaul facilities for M-15 and M-36 GTs post 2007, in addition to overhaul of M3E GTs for which infrastructure was already available since 1991, were examined in Audit.

Records of INS Eksila for the period from 2011-12 to 2015-16 were examined between August and October 2016. Certain clarifications on the creation of infrastructure and utilisation of the existing facilities were sought for, through preliminary enquiries, and replies received thereto, have been suitably incorporated.

#### **Audit Criteria**

We adopted the following sources of audit criteria:

- i) Commanding Officer Standing orders issued on the functioning of INS Eksila.
- ii) Annual Inspection Reports issued by HQ ENC, Visakhapatnam.
- iii) Technical Inspection Reports issued by IHQ MOD (Navy).
- iv) Contracts concluded with Original Equipment Manufacturer (OEM) M/s Zorya Mashproekt, Ukraine for supply of spares, Jigs, tools, fixtures and test stands for all the three types of GTs.
- v) Contracts concluded for procurement of indigenous repair equipment and test bed facilities.
- vi) Records of Planning and Production Control section.

#### **Audit Findings**

Major audit findings are discussed below:

##### **3.2.2 Performance in overhauling of M3E GTs of Rajput class Ships**

M3E GTs are installed on five Rajput class ships of Indian Navy as mentioned in paragraph 3.2.1. Each ship comprises of four GTs and two Reduction Gears



(RGs)<sup>28</sup>. Audit examined issues relating to timely completion of overhauls, accrual of benefits due to experience gained in overhaul and availability of technical manpower etc. pertaining to M3E GTs and the results are discussed in the succeeding paragraphs:

### **3.2.2.1 Abnormal delay in overhaul of M3E GTs**

An overhaul is required to be planned with fixed priorities and a pre-determined schedule for the commencement and completion of overhaul after ensuring the availability of requisite spares and technical manpower.

As per the extant norms a total of 184 working days amounting to eight calendar months are required for completion of overhaul excluding two to four months for completion of test bed trials. Thus, the overhaul of M3E GTs including test bed trials is required to be completed within 12 months (8M + 4M). Merging of the overhauled GTs into serviceable stock indicates completion of overhaul in all respects.

Audit, however, observed (August 2016) abnormal delays in completion of overhaul of all seven M3E GTs undertaken during the period covered in audit, wherein the actual overhaul period ranged from 19 to 70 months as compared to stipulated 12 months (Annexure-VII).

INS Eksila attributed (September 2016) the delay in completion of overhaul of GTs to the change in priorities based on the ship requirement, non-availability of spares, waiting period at shop floor due to ongoing work load, non-availability of manpower, and frequent transfers of experienced sailors.

However, audit noticed from the production data furnished by INS Eksila that in four out of seven GTs overhauled, the delays had occurred mainly due to poor workmanship leading to failure in test bed trials necessitating repeated revisia<sup>29</sup> (rework) (Annexure-VIII).

---

<sup>28</sup> Reduction Gear- Power generated by the Gas Turbine is transmitted to the propeller shaft through Reduction Gear.

<sup>29</sup> Revisia - Disassembly of GT after completion of overhaul for inspection of internal components based on the observations of Gas Turbine Testing and Tuning Team at Naval Dockyard (V).

### **3.2.2.2 Non-accrual of benefits from the experience gained in overhaul**

The overhaul activities of M3E GTs had commenced way back in June 1991 and by January 2016, 37 GTs had been overhauled and merged into serviceable stock. An examination of the average overhaul period taken for the first five completed overhauls with that of last five overhauls revealed that the average overhaul period had increased from 41 months to 43 months as against the prescribed period of 12 months. On being enquired (September 2016) about the efforts made by the Indian Navy to reduce the man-days/man-hours for the overhaul with the expertise gained over the last 25 years, INS Eksila stated (September 2016) that the reduction of man-days/man-hours was not feasible considering the constraints such as non-retention of expertise for longer duration at INS Eksila and various other ship's activities that were planned from time to time.

The reply is indicative of the fact that the Indian Navy could not derive benefits in terms of reduced overhaul period, reduced instances of revisia etc. from its experience of 25 years in overhaul of M3E GTs.

### **3.2.2.3 Shortage of technical manpower for overhaul of M3E GTs**

As per INS Eksila's communication (November 2015) to Flag Officer Commanding-in-Chief, Eastern Naval Command (FOC-in-C, ENC), overhaul of a GT, being a highly specialised task requires extensive 'hands on' training under the guidance of experienced and trained personnel before an Engine Room Artificer (ERA<sup>30</sup>) can be tasked to undertake the overhaul independently. Audit observed (September 2016) that out of 141 ERAs sanctioned at INS Eksila, only 80 to 88 ERAs on an average were available during the period from January 2012 to January 2016, indicating a shortage of up to 43 *per cent*. Further, out of the borne strength, only three to twenty ERAs had a continuity of four to five years, whereas, 22 to 47 ERAs were posted for one or two years. Audit also observed that INS Eksila had proposed to FOC-in-C, ENC, for stay of ERAs for a period of four to five years highlighting that due to quick and unplanned turnaround of key ERAs posted

---

<sup>30</sup> ERAs-Engine Room Artificers are the sailors who mainly deal with the operation and maintenance of marine engines.

in Eksila, there were nil or negligible experienced ERAs left in core production expertise.

INS Eksila stated (September 2016) that the proposal for training and retention of experienced manpower for continuous duration of four to five years was forwarded (November 2015) and was under examination at IHQ MoD (Navy). The fact remains that lack of development of expertise among Engine Room Artificers (ERAs) due to their non-retention for a specific period/ tenure had adversely affected the efficiency of INS Eksila, resulting in revisa and delays in the overhauls of GTs undertaken as discussed in the previous paragraph.

#### **3.2.2.4 Non-maintenance of war reserve**

As per the Material Planning Manual, in addition to insurance spares<sup>31</sup>, specified quantities of spares and items of consumable and permanent naval stores are also required to be maintained as war reserve<sup>32</sup>. All items of war reserve, including insurance spares are to be stocked in addition to Minimum Stock Level (MSL)<sup>33</sup>. Issues/ spares stocked against war reserve can be made only with the prior approval of Assistant Controller of Logistics. Integrated Headquarters Ministry of Defence (Navy) {IHQ MoD (Navy)} prescribed a war reserve of four M3E GTs in May 2014 only. The reasons for not prescribing the war reserve prior to 2014 were not available on records of Eksila.

INS Eksila intimated (August 2016) audit that the war reserve quantity of M3E GTs was not maintained but, did not furnish any reasons.

#### **3.2.3 Setting up of overhaul facilities for M-15 and M-36 GTs under INS Eksila**

An overhaul facility includes civil works for Overhaul Bay, Assembly Stands, Special Tools, Jigs and Fixtures, Repair Technical Documents including Quality Control Procedures; Test Bed for Testing & Acceptance of GTs; provisioning of 'Mandatory' and 'Anticipatory' GT spares as recommended by the OEM; and training of personnel by the OEM. Planning to set up the

<sup>31</sup> Insurance spares are equipment held in stock to cater for war and other unexpected damage.

<sup>32</sup> These are stocks of materiel which an MO or NSD is required to maintain to meet the needs of operations. These are to be held additional to Minimum Stock Level (MSL).

<sup>33</sup> Minimum Stock Level is the level below which the stock of an item should not be allowed to fall.

overhaul facilities for M-15 and M-36 GTs commenced in 1986 and 2008 respectively.

Audit examined the status of creation of the overhaul facilities of these GTs as discussed below:

### **3.2.3.1 Non-setting up of overhaul facilities of M-15 GTs**

1241 RE class ship is equipped with four M-15 GTs (i.e. two each of Cruise GTs and Boost GTs) and two Reduction Gears. Twelve<sup>34</sup> 1241 RE class ships were commissioned into Indian Navy between March 1987 and December 2002 as Veer class corvettes of Indian Navy. M-15 GTs constitute upto 61 *per cent* of the total GTs of Soviet origin held with Indian Navy. The M-15 Cruise and Boost GTs have a maximum service life of 6000 hours/12 years with the overhauling cycle of 3000 hours/six years.

Mention was made in Paragraph No. 2.7 of the C&AG Report No. 5 of 2008 (Air Force & Navy) for the year ended 31 March 2007 that the project conceived in 1986 for repair and overhaul of GTs for 1241 RE class ships awaited completion even after two decades and lack of synchronisation led to technical documents, equipment and spares procured at a cost of ₹21.16 crore remaining unutilised. The Report further pointed out that even after completion of the project, its utility to the Navy would remain limited as these GTs had already received their scheduled overhaul by the OEM and the benefits accrued from the facility would be marginal as more than half of the service life of the ships would be over. In their ATN, Ministry stated (August 2010) that 1241 RE class ships would remain in commission for another 15-20 years and the benefits accrued from M-15 overhaul facility would be substantial.

The creation of overhaul facilities for M-15 GTs post 2007, was examined during current Audit and it was noticed (September 2016) that the facilities were not fully completed even after incurring an expenditure of ₹197.79 crore on civil works (overhauling bay and test station), procurement of tools/jigs, purchase of Repair Technical Documents, purchase of mandatory/defectation

---

<sup>34</sup> Two out of 12 ships have been decommissioned in April 2016.

stores/spares and creation of Test Bed etc. Further, INS Eksila had overhauled only one M-15 CGT (August 2008-April 2009) which had failed prematurely in October 2012. Meanwhile, two RE class ships have already been decommissioned in April 2016 which needs to be looked against the backdrop of Ministry's ATN in 2010 stating that these ships would remain in commission for another 15-20 years.

Audit examined the creation/utilisation of various facilities as discussed in succeeding paragraphs:

**(a) Non-installation of test stands for M-15 CGTs**

It was mentioned in the earlier Audit Report that Special Tools, Jigs and Fixtures required for the overhaul of M-15 CGT procured between June 1997 to December 1999 at a cost of ₹7.53 crore were lying unutilised due to non-establishment of repair facilities. Further, the test stands<sup>35</sup> costing USD 1,869,700 (₹9.27 crore) were received in 2010 and were yet to be installed/set to work. In addition, tools, appliances costing USD 2,230,300 (₹11.06 crore) were procured between the year 2010 and 2012.

INS Eksila attributed (October 2016) the delays to non-inclusion of installation of test stands and translation of installation documents, in the contract (May 2009). They further added that the problems encountered during installation had been taken up with the OEM (M/s Zorya) and setting up/ installation of test stands would be undertaken jointly with the specialists (OEM).

Thus, non-inclusion of installation clause in the contract for procurement of test stands resulted in its non-installation since procurement in April 2010.

**(b) Non-procurement of tools, appliances, jigs and fixtures for M-15 BGTs**

INS Eksila forwarded the requirement (December 2008) of tools, appliances, jigs and tools for BGTs to IHQ MoD (Navy). IHQ MoD (Navy) intimated INS Eksila only in April 2015 that the case for procurement was kept in abeyance due to lapse of the funds which were allocated, directing them to forward a revised statement of case (SoC) to enable the procurement against the Annual

---

<sup>35</sup> Test Stand– the overhaul of GTs is carried on test stands which are installed in the repair/overhaul bay.

Acquisition Plan 2015-17 . INS Eksila forwarded the SoC in May 2015, which was under consideration (October 2016) at IHQ MoD (Navy). Reasons for the delay of seven years in processing the requirement were enquired and the reply was awaited (March 2017).

**(c) Non-Provisioning of ‘Mandatory’ and ‘Defectation’ GT spares**

Mandatory spares are necessarily replaced during the overhaul process and are shortlisted based on the OEM’s experience in conducting the overhaul. Mandatory spares are of two types. Type-I are non-reusable spares used during ‘Revisia’ and Type-II are the spares used during overhaul process. Defectation spares cater for items which are replaced based on checks recommended by the OEM during overhaul. Audit examination of provisioning of these spares revealed as discussed below:

**(i) Cruise GT:**

Two sets of mandatory spares were procured in the year 2001 at a cost of ₹1.95 crore. Of these, spares costing ₹0.94 crore were consumed during the maiden overhaul of M-15 Cruise GT (2008-2009) leaving the balance quantity of one incomplete set of spares. The procurement of balance spares to complete the incomplete set was progressed (February 2011) by INS, Eksila with IHQ MoD (Navy)/DME, which concluded the contract in March 2016 and the spares were received in December 2016. One set of defectation spares costing ₹15.03 crore was received in October 2010 against the contract (December 2009) and was held in stock (September 2016) with prospect of its utilisation being remote in view of non-availability of the technical expertise at INS Eksila as discussed in paragraph 3.2.3.1 (e).

**(ii) Boost GT**

The demand for six sets of mandatory spares and one set of defectation spares, catering for overhaul of six Boost GTs, was raised by INS Eksila in December 2008. However, the spares were contracted by IHQ MoD (Navy)/DME only in

March 2016 at a cost of USD 11,018,427.60 (₹73.46 Crore) and received in December 2016<sup>36</sup>.

Audit enquired (September 2016) about the delay of eight years in conclusion of contract and the procurement policy of GT spares. IHQ MoD (Navy) stated (December 2016) that the policy for demanding and procurement of spares for INS Eksila was under drafting/ review. The reply was, however, silent on delay.

**(d) Inadequate Repair Technical Documents**

Repair Technical Documents (RTDs), are essential in undertaking the overhaul of GTs because they lay down the process of overhaul. It was mentioned in the previous Audit Report that RTDs were procured in 1997 for GTs at a cost of ₹10.70 crore.

Audit noticed (September 2016) from the Annual Technical Inspection Report that the RTDs procured in 1997 were inadequate for undertaking the overhaul of new version of CGTs (*i.e.*, DC76.1<sup>37</sup>), which were inducted into Indian Navy post 2008. In response to audit query INS Eksila stated (September 2016) that these RTDs would be contracted separately for overhaul of DC76.1 CGTs. In view of this, the capability of INS Eksila with regard to the overhaul of DC76.1 CGTs was constrained till receipt of these RTDs.

The fact remains that RTDs for DC76.1 CGTs were yet (September 2016) to be contracted despite its (*i.e.*, CGTs) induction into Indian Navy post 2008.

**(e) Training of Manpower**

Planning to set up the overhaul facilities for M-15 GTs commenced in 1986, while training of personnel by the OEM was considered essential only after 28 years (May 2014) owing to the requirement of higher skills for overhaul of these GTs.

Audit noticed (September 2016) that INS Eksila had written (May 2014) to IHQ MoD (Navy) that no sailor was borne on its (*i.e.*, INS Eksila) strength with expertise in overhaul of M-15 GTs, which required higher skills and

<sup>36</sup> INS Eksila's letter No. 438/19 dated 14 March 2017

<sup>37</sup> 1241 RE class ships were originally fitted with Cruise GTs (DC76), which have been replaced by the OEM with new version CGT (DC 76.1) post 2008.

appropriate training by the OEM. In response to an audit query, INS Eksila stated (September 2016) that two teams of six personnel each were likely to be deputed to the OEM for training during future overhauls of the GTs undertaken by OEM. Thus, absence of trained manpower impinged on the capacity of INS Eksila to undertake overhaul of M-15 GTs even while the planning for setting up of facilities had started as early as 1986.

**(f) Non-Setting up of test bed facility for M-15 GTs**

Audit Report (2008) had pointed out that the Draft Project Report (DPR) for setting up of testing facilities was under consideration by Director General Naval Projects, Visakhapatnam [DGNP(V)] even 17 years after approval (October 1989) of the of project. Ministry's ATN (August 2010) was silent on the issue. Audit noticed (September 2016) that based on the DPR(November 2007), sanction was accorded (July 2008) for consultancy for project monitoring and setting up of test bed by the Ministry at a cost of ₹29.62 crore, which was revised<sup>38</sup> (February 2010) to ₹37.82 crore. DGNP concluded a consultancy contract (2009) with M/s Rail India Technical and Economic Services (RITES) at a cost of ₹2.32 crore. The consultancy contract, *inter alia*, stipulated that the test data was to be generated by using proven GT. Further, the DGNP concluded (March 2010) a contract for creation of test bed facility with M/s Ultra Dimensions Ltd., Visakhapatnam at a cost of ₹35.29 crore. The work was completed in February 2014 with a delay of 17 months.

Audit noticed (September 2016) that in March 2014, the DGNP (V) {*i.e.*, the contract concluding authority} had issued a completion certificate to the firm (*i.e.*, M/s Ultra Dimensions Ltd.) based on generation of test bed parameters on two GTs which had been exploited by the Indian Navy up to 99.5 *per cent* and 110 *per cent* of their useful service life and no proven/serviceable/new GT was earmarked by the Navy/INS Eksila for calibration/authentication of test bed parameters. Subsequently, INS Eksila had written (May 2014) to the

---

<sup>38</sup> Revision in sanction was due to increase of ₹2.14 crore in cost of civil works, ₹5.33 crore in cost of equipment and ₹0.73 crore in cost of external services.



IHQ MoD (Navy) on the issues<sup>39</sup> which needed immediate attention to progress of M-15 GTs overhaul, emphasising the necessity to position one set of new GTs to calibrate /authenticate the generated test bed parameters and procedures. Audit also noticed that the test bed facility was offered (August 2014) by INS Eksila to M/s Zorya (*i.e.*, OEM of the GTs) for joint review to ascertain its readiness for M-15 GT tests.

INS Eksila stated (October 2016) that instead of using a new GT, test bed parameters were generated by using two GTs which were removed from ships due to expiry of their service life and the GTs were proven.

The reply is not tenable as the usage of proven GTs for calibration of test bed parameters was envisaged in the consultancy contract and GTs at usage up to 99.5 *per cent* and 110 *per cent* of their useful service life, do not befit a 'proven GT', as is evident from INS Eksila's request (May 2014) to IHQ MoD (Navy) for new GTs. The Audit contention is buttressed by the fact that INS Eksila had emphasised (May 2014) to IHQ MoD (Navy) the necessity to position one set of new GT to calibrate /authenticate the generated test bed parameters and in the review (August 2014) of the test bed facility by M/s Zorya to ascertain its readiness for M-15 GT tests.

Thus, the authentication of the parameters and procedures generated by the M-15 test bed facility created (February 2014) at a cost of ₹37.61 crore (₹2.32 crore + ₹35.29 crore) remained to be proven (October 2016)<sup>40</sup> as the test bed parameters were not generated by using new GT as requested by INS Eksila to IHQ MoD (Navy).

**(g) Non-utilisation of CNC<sup>41</sup> grinding machines for M-15 GTs**

Based on an urgent need (January 2008) for augmentation of grinding machinery related to M-15 cruise GTs and sanction accorded (March 2008) by

---

<sup>39</sup> In May 2014, CO INS Eksila took up pending requirements for M-15 GT overhaul such as expertise in training, manpower enhancement, special tools and jigs for BGT, fuel equipment overhaul facility, mandatory and anticipatory spares, commissioning of equipment stands, etc. with IHQ MoD (Navy).

<sup>40</sup> INS Eksila's letter No. 438/19 dated 21 October 2016

<sup>41</sup> Computer Numerical Control (CNC) is the automation of machine tools by means of computers executing pre-programmed sequences of machine control commands. This is in contrast to machines that are manually controlled by hand wheels or levers, or mechanically automated by cams alone.

the Ministry, Director General of Naval Projects [DGNP (V)] procured four grinding machines at a cost of ₹27.47 crore, which were received at INS Eksila between August and October 2010.

Audit scrutiny (October 2016) revealed that the machines had not been utilised for overhauling of M-15 GTs.

INS Eksila stated (October 2016) that the machines were being utilised for undertaking machining of M-3E GTs and its generator components.

It is evident from the reply that the grinding machines procured on grounds of urgent necessity (January 2008) at a cost of ₹27.47 crore, were not being utilised for the intended purpose of grinding the M-15 GT components, due to delays in creation of other overhaul facilities.

**(h) Offloading of overhauls to the OEM due to delay in completion of overhaul facilities**

Overhaul facilities for M-15 GTs planned (1986) even before induction/commissioning of the envisaged ships remained incomplete (November 2016) due to apparent lack of synchronisation thereby necessitating continued offloading of overhaul of M-15 GTs to the OEM (*i.e.* M/s Zorya) as discussed below.

Mention was made in the Audit Report (2008) about the fact that non-establishment of repair facilities compelled Indian Navy to send nine GTs, between May 2001 and December 2005, to OEM for overhaul and repair at a cost of ₹107.94 crore. Ministry in their ATN had stated (August 2010) that it would be immensely beneficial even if the facility is set up within the envisaged timeframe of 2010.

In view of non-availability of the facility for overhaul of M-15 GTs, Audit enquired (September 2016) about the GTs sent for overhaul to the OEM (*i.e.* M/s Zorya) and cost incurred thereon.

IHQ MoD (Navy) intimated (December 2016) Audit that between 2006 and 2015, 72 GTs (*i.e.* M-15) were offloaded to OEM for repair/overhaul at a cost of ₹194.41 crore.

The fact remains that the envisaged timeframe of 2010 for completion of the

M-15 overhaul facility as indicated by the Ministry in their ATN, was yet (October 2016) to be met as discussed in paragraph 3.2.3.1 (f) thereby further diluting the benefits from creation of the facility. Meanwhile, two out of twelve 1241 RE class ships had been decommissioned by April 2016.

### **3.2.3.2 Non-setting up of the overhaul facilities for M-36 GTs of Delhi Class Ships**

M-36 GTs are installed on three ships each of Delhi and Kolkata class @ four GTs per ship. The Delhi class ships were inducted into Indian Navy from November 1997 and the Kolkata class ships from August 2014. The M-36 GTs have a service life of 40,000 hours /20 years and the overhauling cycle of 20,000 hours/10 years.

Headquarters, Eastern Naval Command constituted (March 2008) a Board of Officers (i.e. Board) for provision of overhaul facilities for M-36 GTs at INS Eksila. Based on the recommendations (February 2010) of the Board and with the objective of reduced dependence on OEM (i.e., M/s Zorya) for the overhaul, the Ministry sanctioned (June 2012) the setting up of overhaul facility for M-36 GTs at INS Eksila' at an estimated cost of ₹38.27 crore. The work was to be completed by July 2014. The sanction catered for civil works (₹21.45 crore) and equipment<sup>42</sup> (₹16.82 crore). The civil works were completed (October 2015) at ₹12.83 crore and handed over (December 2015) to the Indian Navy. All equipment were procured by March 2016 at a cost of ₹5.59 crore except assembly/dismantling stands (sanctioned cost of ₹5.79 crore) and storage containers (₹0.77 crore), which were in process of procurement as of September 2016<sup>43</sup>.

Audit noticed (August 2016) that the design for assembly and dismantling stands considered at the Board (February 2010) stage was provided by a local vendor and INS Eksila had apprised (May 2014) IHQ MoD (Navy) that it was difficult to generate the manufacturing drawings based on the design of the local vendor and involvement of the OEM for supply of the original drawings/equipment was inescapable.

---

<sup>42</sup> Equipment- comprised of overhaul equipment including 17 numbers of assembly/dismantling stands (₹15.76 crore) along with storage facility and containers (₹1.06 crore).

<sup>43</sup> INS Eksila's letter No.438/19 dated 7 October 2016.

On an Audit query (August 2016) about suitability of the design at the Board (February 2010) stage, whereas the same being found unsuitable at the procurement stage, INS Eksila stated (October 2016) that the task of indigenous designing was considered due to non-availability of OEM's assistance at the Board stage and OEM's advice was obtained (August 2014) as development of stands locally was not found feasible. It was further stated that the overhaul of M-36 GTs could not be undertaken as the dismantling/assembly stands and training of personnel through OEM were required for carrying out the overhaul. INS Eksila also stated that a case for augmenting the existing M-15 test bed facility for undertaking testing of M-36 GTs, post their overhaul, at an estimated cost of ₹95.52 crore was initiated in July 2016, while the issue of imparting training to the personnel was under process at IHQ MoD (Navy).

Thus, Indian Navy's inability to synchronise the civil works completed in October 2015 and equipment, which were under procurement (October 2016), delayed the creation of the facility conceived in March 2008. Meanwhile, two M-36 GTs had been offloaded<sup>44</sup> (March 2015) for overhaul through OEM at a cost of ₹15.42 crore.

### **3.2.4 Low indigenisation of overhaul spares**

As per the Indian Navy's Material Management Manual (MMM) indigenisation is important for self-reliance as in many cases equipment become obsolete in the country of origin but requirement for the same in the Navy persists. The Manual provides for identification of equipment that require to be indigenised and according priority to indigenisation.

Audit noticed (October 2016) that the annual plan for indigenisation of mandatory spares was neither prepared nor promulgated and cases for indigenisation were proposed by INS Eksila as emergent requirements. Further, there was no provision of funds for indigenisation of GTs during 2012-13 and 2013-14 and no expenditure thereof was incurred after 2011-12. Audit examination of indigenisation of mandatory spares revealed as given in Table 3.6 below:

---

<sup>44</sup> Directorate of Marine Engineering IHQ MoD (Navy) letter No. EG/3512/GT dated 15 December 2016

**Table-3.6: Details of indigenisation of mandatory spares**

SI No.	Type of GT	Total No. of mandatory spares	No. of mandatory spares indigenised	Percentage of indigenisation
1	M3E GT	562	104	18.50
2	M-15 CGT	657	130	19.78
3	M-15 BGT	626	61	9.74
4	M 36 GT	No. of spares not yet known as discussions were in progress with OEM and lists yet to be finalised		

INS Eksila stated (October 2016) that no spares were identified for indigenisation with respect to the GTs indicated in Table 3.6 and indigenisation was undertaken on emergent basis. Further, lack of details of drawings, manufacturing procedure in the OEM documents were the main reasons for continued dependency on imported spares. It was also stated that procurement and financial procedures in vogue and violation of Intellectual Property Rights in trying to make components through reverse engineering, were also responsible for slow progress in indigenisation.

The fact remains that spares were not identified for indigenisation with respect to any of the GTs indicated in Table 3.6, which was in deviation from the provisions in the MMM. Further, no provision of funds for indigenisation of GTs during 2012-13 and 2013-14 and 'Nil' expenditure thereof after 2011-12, is indicative of a lack of seriousness in efforts for indigenisation of the spares for GTs.

### **3.2.5 Non-maintenance of Cost Accounts in INS Eksila**

Naval Dockyard Cost Accounting Instructions prescribe for cost accounting to be followed in Naval Dockyards (NDs) in order to ensure that the Government money is spent efficiently/ economically, the progress of expenditure is maintained within the limits of estimates, the manpower is deployed against authorised works, the materials drawn for each work are properly accounted for/expended, the estimates are prepared properly and correctly assessed.

Since INS Eksila is a repair organisation akin to NDs, Audit enquired (October 2016) into the reasons for not maintaining the cost accounts/data.

INS Eksila cited (October 2016) differences in the nature of work force between NDs (civilian personnel) and INS Eksila (service personnel), difficulty in establishing man hours at work due to deployment of service

personnel for various other duties besides overhaul work and frequent turning around of sailors as reasons for not maintaining the cost accounts.

The reasons given by INS Eksila do not obviate the necessity for maintaining the cost data as in the absence of the data the economy and efficiency in utilising of public money is not ensured and the cost effectiveness of the overhaul of GTs under taken in INS Eksila cannot be established.

### **3.2.6 Conclusion**

INS Eksila is overhauling the M3E GTs since 1991, but it continues to encounter abnormal delays in completion of the overhaul of the GTs. Neither Eksila accrued any benefits in terms of reduced overhaul period and reduced instances of revisa nor was it in a position to maintain the war reserve of M3E GTs as prescribed. The facility required for overhaul of M-15 GTs was yet (October 2016) to be completed though the facility had been planned to be set up since 1986. Meanwhile, two out of twelve 1241 RE class ships, which employ the M-15 GTs, had been decommissioned by April 2016. Overhaul facility for M-36 GTs planned in 2008, has also been delayed for want of synchronisation between civil works and procurement of equipment. Consequently, Navy continued to depend on OEM for overhaul of M-15 and M-36 GTs, incurring an expenditure of ₹317.77 crore up to December 2016. INS Eksila is grappling with inadequate availability of technical expertise, due to their non-retention for longer duration. Indigenisation of equipment was undertaken on emergent basis instead of being planned and prioritised as envisaged in Material Management Manual. Due to non-maintenance of cost accounts, Audit could not derive assurance about the cost accuracy of the expenditure on overhauls of GTs.

### **3.2.7 Recommendations**

- ✓ *While establishing the overhaul facilities in INS Eksila, Navy may adopt an integrated approach for setting up of various facilities, with planned schedules and defined time lines.*
- ✓ *Creation of infrastructure facilities for the overhaul of GTs may be synchronised with the overhaul cycle of GTs prescribed by the IHQ MOD (Navy).*
- ✓ *In order to derive optimum benefit from the technical expertise gained by*

*ERAs the Navy should fix a specific tenure of posting and should also deploy adequate manpower.*

- ✓ *Indigenisation of the GT spares need to be taken up in a planned and time bound manner.*
- ✓ *Cost accounting system should be introduced to ensure economics of expenditure incurred on overhauls.*

The matter was referred to the Ministry (December 2016); their reply was awaited (March 2017).

### **3.3 Operation and Maintenance of UH-3H helicopters**

**The UH-3H fleet of helicopters, procured as an integral part of Landing Platform Deck, was unable to maintain the desired levels of serviceability in six out of seven years of its operations since commissioning despite reduction of the Unit Establishment of the squadron from four to three helicopters. In absence of clear targets, the deck based flying remained significantly low. Non-existence of dedicated depot level maintenance facilities and non-availability of spares adversely impacted the maintenance of the fleet. Further, Navy continues to be dependent on the foreign repair agency for maintenance, servicing and logistics issues due to lack of training of Naval personnel.**

#### **3.3.1 Background**

Six UH-3H helicopters along with training and support facilities at an approximate cost of ₹182.14 crore were acquired from the United States Government (USG) to be used on the Landing Platform Dock (LPD), INS Jalashwa {also acquired (June 2007) from the USG}. These helicopters with the envisaged objective of providing an all-weather day and night assault transport of combat troops, supplies and equipment, were received<sup>45</sup> in September 2007. The designated life of the LPD was 12 to 15 years, whereas, the UH-3H helicopters had a service life of 2,000 flying hours<sup>46</sup> or ten years.

<sup>45</sup> Indian Naval Air Squadron (INAS)- 350 was commissioned in Indian Navy in March 2009

<sup>46</sup> Out of the total designated life of 17000 hours, helicopters had already exhausted 15000 hours and were available for 2000 hours more.

Audit, in its Report (2010-11), had pointed out that in view of vintage<sup>47</sup> of the helicopters and obsolescence of spares, maintenance of the six refurbished helicopters by Indian Navy would be a challenging task and one helicopter had already been cannibalised to ensure serviceability of the other five helicopters. The Ministry, in their draft<sup>48</sup> Action Taken Note (ATN), had stated (September 2013) that the procurement of UH-3H helicopters was a considered decision to provide an interim solution for onboard aircraft of INS Jalashwa pending proving of Advanced Light Helicopter (ALH) for deck operations and inductions of Multi Role Helicopters (MRH), which was expected to take another 10 years. The Ministry also stated that the decision of robbing of one aircraft was taken in order to quickly operationalise the other five helicopters and all but one helicopter have been operationalised by US contractors.

With this background, Audit examined the exploitation of these helicopters with reference to the objective, management of the spares, setting up of infrastructural facilities since their induction in Indian Navy. In view of their significance for operations onboard INS Jalashwa, their availability and maintenance were examined at the Squadron and at Material Organisation, Visakhapatnam {MO (V)}. Audit noticed (February 2016) that Indian Navy had obtained approval (February 2014) from the competent authority for life extension of these helicopters till 2022 so as to match with service life of the LPD.

### **Audit Findings**

#### **3.3.2 Low serviceability of helicopters even with the assigned UE**

As per the Indian Navy Air Publication-2 (INAP-2) for assessing the efficiency of squadrons/flights, serviceability of below 50 *per cent* is categorised as “Unsatisfactory”, whereas above 90 *per cent* is termed as ‘Excellent’. Serviceability of helicopters thus indicates its availability.

Audit observed that despite the fact that Unit Establishment (UE) of the squadron had been reduced by Indian Navy from four to three helicopters in

<sup>47</sup> Six UH-3H helicopters were manufactured between January 1961 and July 1965

<sup>48</sup> The Action Taken Note of Ministry is still to be vetted as on March 2017.



view of their vintage and their maintenance intensive nature, yet the average serviceability levels of the fleet were unsatisfactory as given in Table 3.7 below:

**Table-3.7: Annual average serviceability status of UH-3H helicopters**

	Year						
	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
<b>Serviceability (in %)</b>	46.84	46.09	42.79	54.69	44.06	46.17	27.10

*Source: Half yearly flying returns of the Squadron*

The Ministry accepted (July 2016) the Audit observation and stated obsolescence of system, lack of expertise to maintain vintage helicopters, frequent failure of components and lack of spares as the reasons for low serviceability.

The fact remains that the average serviceability levels of the helicopter fleet remained unsatisfactory in six out of seven years of its operation, since commissioning of the Squadron in March 2009, despite reducing the number of helicopters for Squadron operations to three against the sanctioned UE of four helicopters.

### **3.3.3 Non-promulgation of quantum for deck based flying**

The proposal for acquisition of six helicopters had envisaged (August 2006) that with the ability to perform various roles, these helicopters would be a potent force multiplier and would operationally enhance the utilisation of the LPD. The Annual Flying Tasks (AFTs) are issued by Integrated Headquarters Ministry of Defence (Navy) {IHQ MoD (Navy)} and prescribe the number of hours of day and night flying required to be undertaken by the Squadron each year with reference to their operational, training and miscellaneous tasks.

Audit examination of the AFTs issued by Indian Navy revealed that the AFTs issued by IHQ MoD (Navy) between 2009-10 and 2015-16 did not specifically indicate the targets for Deck Based Flying to be carried out by the Squadron. Further, examination of the records of flying carried out by the Squadron revealed that the Deck Based Flying carried out by these helicopters from

2009-10 to 2015-16<sup>49</sup> was significantly low. The Deck Based Flying carried out ranged from 2.7 to 34 *per cent* of the total flying carried out by the helicopters during the day and zero to 52.08 *per cent* of the total flying of helicopters carried out during night.

In its reply, the Ministry stated (July 2016) that there was no fixed percentage of Deck Based Flying as it depends on the operational requirement and exercises being undertaken.

The reply is not tenable as the UH-3H helicopters were procured for enhancement of operational performance of LPD with helicopters to be used as the potent force multiplier. However, in view of the low percentage of Deck Based Flying and no prescribed quantum for Deck Based Flying, Audit could not derive assurance with regard to the usage of these helicopters *vis à vis* the LPD as envisaged at the time of their procurement.

### **3.3.4 Maintenance of helicopters**

A mention was made in Report of C&AG's Report No 7 of 2010-11 that considering the vintage (1961-1965) of helicopters and the obsolescence of spares, maintenance of the six helicopters would be a challenging task. The Ministry, in its draft ATN (September 2013), stated that the induction of UH-3H helicopters was made to meet INS Jalashwa's requirements pending availability of utility role MRH for about 10 years. In view of criticality of the helicopter fleet to the needs of Indian Navy, audit examined the availability of Standard Depot Level Maintenance (SDLM) facility and Engineering Technical Services required for ensuring optimal maintenance of these helicopters. Details are as discussed below:

#### **3.3.4.1 Non-existence of Standard Depot Level Maintenance facility**

Standard Depot Level Maintenance (SDLM) for these helicopters is required to be undertaken after every 33 months of operations. SDLM for these six helicopters was carried out (April 2001–October 2004) prior to their induction (September 2007) into the Indian Navy. The facility for SDLM of helicopters was not contracted by the Ministry due to envisaged limited utilisation.

---

<sup>49</sup> Deck based flying for the year 2011-12 was not considered due to LPD undergoing refit in that year

Audit observed (December 2015) that four cycles of SDLM for these helicopters, as per the maintenance schedule; fell due between October 2004 and December 2015 (*i.e.* 134 months). However, due to non-availability of the facilities, SDLM was not being carried out *vis a vis* the prescribed duration of 33 months. Instead, the helicopters had undergone only Aircraft Service Period Adjustment (ASPA) inspection<sup>50</sup> (a visual inspection) annually since their receipt, even though ASPA inspection must be performed in conjunction with SDLM, *i.e.* six months prior to or 90 days after the expiry of an aircraft's Period End Date (PED)<sup>51</sup>. Audit also observed that HQ ENC (V) had processed (August 2014) a case to IHQ MoD (Navy) for creation of SDLM facility.

In response, the Ministry stated (July 2016) that SDLM is a condition based maintenance and is warranted based on ASPA result. The Ministry added that since ASPA never failed, SDLM was not warranted.

The reply of the Ministry is not tenable because the ASPA evaluation is not a substitute for SDLM. Further, scope of ASPA is restricted to visual inspection, whereas, SDLM takes care of air frame, systems and components inspection, defect correction, preventative maintenance, modification and technical directive compliance. Thus, in view of specific time period of 33 months fixed for undertaking SDLM and also due to difference in its scope *vis a vis* ASPA, these two activities cannot be treated as complementary to each other. Significance of SDLM is further substantiated by the proposal (August 2014) of HQ ENC (V) for creation of the SDLM facility, which was under consideration (January 2017)<sup>52</sup> at IHQ MoD (Navy).

#### **3.3.4.2 Dependency on hired Contractor Engineering Technical Services (CETS)**

As per the Letter of Offer and Acceptance (LOA)<sup>53</sup>, Contractor Engineering

---

<sup>50</sup> ASPA inspection - The object of ASPA is to assess the overall material condition of the helicopter for the purpose of determining if each helicopter can remain in service beyond PED. Airframes which meet all the qualification requirements of ASPA will receive a 12-month deferral of standard SDLM induction.

<sup>51</sup> PED is completion of 33 months after SDLM

<sup>52</sup> Headquarters ENC (V)'s letter No. AE/0168/AUDIT dated 7 February 2017

<sup>53</sup> LOA- Letter of Offer and Acceptance forwarded by US Government in August 2006 and approved by the Ministry in November 2006.

Technical Services<sup>54</sup> (CETS) were to be provided by the supplier to the Indian Navy for a period of two years at a total cost of MUS\$ 1.48 (₹6.9 crore). Main functions of the CETS were to conduct refresher training for the technicians, assisting the maintenance personnel as technical advisors and on-the-job training. CETS was to act as a focal point for communication with the Naval Air<sup>55</sup> for Aircraft on Ground (AOG) spare support and maintenance with the organisation. As per the provisions of LOA, the CETS could be extended for additional two years, beyond which, Indian Navy personnel were to carry out the function.

Audit observed (December 2015) that the services of CETS were hired beyond the contractual period, as tabulated in Table 3.8 below:

**Table-3.8: Contracts for Engineering Technical Services**

Period of Contract	Contract No & Date	Total Contract Cost
09/2007 to 9/2009	As per LOA for acquisition of helicopters	₹6.89 crore
10/2009 to 01/2011	Not available	Not available
01/2012 to 02/2014	AR/6500/CETS Dt 28-11-2011	₹4.83 crore
w.e.f. 11/2015	AR/6500/CETS Dt 23-11-2015	₹12.77 crore

As may be seen from the Table 3.8, no CETS contract was in force between February and December 2011 and again from March 2014 to October 2015. Audit noticed (December 2015) that the Indian Navy did not acquire expertise of technical/maintenance services as envisaged in the LOA even after eight years since induction (September 2007) of helicopters.

The Ministry stated (July 2016) that support from Programme Management Authority (PMA) of US (Navy) was available up to 2011 and support from US vendors was established for the repair and overhaul. Ministry further added that CETS contract was inevitable due to different maintenance philosophies between the US Navy and Indian Navy and due to lack of product support from US Navy.

The reply is not tenable as assurance given at the time of acquisition that various maintenance, servicing and logistics issues beyond the contractual

<sup>54</sup> CETS-Services of an airframe/Engine technician, Avionics/Electrical technician for two years and a logistics support representative for one year were provided under CETS.

<sup>55</sup> Naval Air is the aviation wing of US Navy.

period would be carried out by the trained Indian Naval personnel and the timelines envisaged in the LOA for catering to the requirement within a maximum period of four years, were not complied with.

#### **3.3.4.3 Annual Review of Demands for spares**

Provisioning of spares for naval aviation assets is primarily done by raising Annual Review of Demands (ARDs). The average gestation period for supply of spares under this method is about 36 to 42 months from raising of demands under ARDs. In order to ensure availability of required spares for smooth operations of UH-3H helicopters, preparation of Annual Review of Demands (ARDs) was commenced in 2010-11 at Material Organisation, Visakhapatnam {MO (V)}.

Audit noticed (December 2015) that the process was terminated by IHQ MoD (Navy) with effect from 2013 in view of anticipated de-induction of helicopters in 2017 and it was decided that the procurement of spares will be progressed based on actual requirement on a case to case basis. Further, the Board of Officers convened (December 2014) by HQ ENC (V) observed that the second line helicopters were cannibalised/robbed extensively in order to ensure serviceability of front line helicopters. The Board had, therefore, recommended procurement of spares under ARD cycle for their timely procurement so as to ensure smooth UH-3H operations from 2015-16 onwards and also; in case the operational life of UH-3H helicopters was extended till 2022.

Audit observed (January 2016) that three helicopters (SU 539, SU 538 and SU 540) had been grounded since January 2014, May 2014 and March 2015 respectively due to non-availability of spares and as cited (October 2015) by Regional Air Quality Assurance Service (RAQAS) to HQ ENC (V), 728 demands for spares on all six helicopters were outstanding which contributed to poor availability and reliability of the helicopters. Thus, discontinuation of ARDs had resulted in cannibalisation/robbing of second line helicopters leading to three helicopters being Aircraft on Ground (AoG).

The Ministry stated (July 2016) that procurement of spares under ARDs was discontinued in order to prevent accumulation of non-moving inventory and

the spares were continued to be procured to meet the actual requirements on the basis of recommendations of Headquarters, Naval Aviation (HQ NA), Goa.

The reply of Ministry is not acceptable as the shortage of required spares had not been addressed in time as was evident from the serviceability status of second line helicopters, all three of which were AoG.

### **3.3.5 Non-utilisation of costly Air Stores**

Audit noticed (January 2016) that three Receiver Transmitter, Radar valuing US\$ 643,473 (₹3.00 crore) were received in year 2009 from the US (Navy) and were lying with MO (V) since their receipt.

The Ministry stated (July 2016) that the procurement was based on manufacturer's recommendation in view of the non-availability of expertise with the Indian Navy. Criticality of the equipment was also one of the factors for the procurement to maintain the float till 2022.

The Ministry's reply was not backed by any evidence as all the stores received in the year 2009 were held in stock (November 2016). Further, the decision to extend life of the helicopters up to 2022 was taken only in 2014.

### **3.3.6 Conclusion**

The fleet of six UH-3H helicopters, procured as an integral part of Landing Platform Deck, with primary objective of providing an all-weather day and night assault transport of combat troops, was unable to maintain the desired levels of serviceability which remained unsatisfactory *i.e.*, below 50 *per cent* in six out of seven years of its operations since commissioning (March 2009) despite reduction of the Unit Establishment of the squadron from four to three helicopters. Further, in absence of clear targets, the deck based flying remained significantly low ranging from 2.7 to 34 *per cent* of total day flying and zero to 52.08 *per cent* of the total night flying undertaken by the squadron. The maintenance of the helicopter fleet was impacted adversely due to non-existence of dedicated depot level maintenance facilities and non-availability of spares due to lack of continuity in ARDs for procurement of spares. The timelines of four years for training of Navy personnel (*i.e.*, maintenance,

servicing and logistics issues) as envisaged in the Letter of Offer and Acceptance was not adhered to resulting in continued dependence of Navy on the foreign repair agency.

### **3.4 Risky exploitation of Sindhughosh class submarines due to delay in installation of periscopes**

**Delay of more than 34 months in according approval by the Ministry for amendment to contract for change in ownership of the seller and delivery period extension, required for supply of the periscopes, led to delay in delivery and installation of periscopes for Sindhughosh class submarines. This resulted in risky exploitation of submarines for 22 to 62 months till next refit.**

Periscopes are visual sensors fitted in submarines, used for safe navigation, collision avoidance, surveillance of targets, torpedo attack and periscope photography. Sindhughosh class submarines are fitted with two periscopes each, having only monocular vision with no night vision/low light vision capability and rudimentary ergonomics. Limitations in these periscopes have an adverse impact on the safety and efficiency in the operations of submarines. In pursuance of the Indian Navy's minimum critical requirement (April 2008) for replacement of one periscopes each on all Sindhughosh class submarines with new periscopes having night vision/low light vision and integrated radar and communication support measures, a contract was concluded (October 2011) with M/s Kollmorgen, USA at MUSD 39.74 (₹184.33 crore)<sup>56</sup>. The scheduled delivery of first periscope system was in October 2013, second in April 2014 and remaining eight by December 2016 at an interval of four months. The contracted delivery schedule of the periscopes was in sync with the scheduled refit programme of the submarines as the periscopes could be installed on the submarines only during their refits.

In February 2012, M/s Kollmorgen was taken over by M/s L-3 Communication, which sought (November 2012) consent of Indian Navy for transfer and assignment of the contract (October 2011) in its entirety to the

---

<sup>56</sup> @1 USD= ₹46.38

firm under Article-27 of the contract. The matter was referred (January 2013) to the Ministry by Integrated Headquarters, Ministry of Defence (Navy) {IHQ MoD (Navy)} seeking their approval for amendment to the contract. The Ministry in turn forwarded the case to Legal Adviser (Defence)<sup>57</sup> {LA (Def)} and Judge Advocate General (Navy)<sup>58</sup> {JAG (Navy)}. While, LA (Def) opined (April 2013) that transfer of rights and obligations under the contract by M/s Kollmorgen Corporation to M/s L-3 KEO was in contravention to the provisions under Article-27 of the contract, the JAG (Navy) recommended (May 2013) that a supplementary agreement to the contract be signed between Indian Navy and L-3 KEO, for effecting necessary amendments in the contract and obtain an Indemnity Bond from M/s L-3 KEO to meet all the responsibilities and obligations under the contract. The requisite amendment to the Contract was made in May 2014, *i.e.*, after 16 months from the date of proposal (January 2013) for amendment to the contract and 12 months from the date of receipt of advice from the Judge Advocate General.

A case for delivery period (DP) extension was also initiated by IHQ MoD (Navy) in October 2014. Meanwhile, IHQ MoD (Navy) further apprised (November 2014) the Ministry that even though the firm was progressing with the manufacture as per the contractual milestones, the delay (*i.e.*, in approval) would lead to a situation, wherein, all the multiple systems would be delivered at one go instead of staggered manner as stipulated in the contract and forfeiting the advantage of availing the warranty period and obviate the anticipated usage of Periscopes in the scheduled refits of the submarines. The delivery period extension with levy of Liquidated Damages (LD) was approved by the Ministry only in November 2015 *i.e.*, after a delay of 13 months. The firm supplied seven periscopes between March 2016 and

---

<sup>57</sup> Legal Advisor (Defence), a part of Ministry of Law & Justice, is the legal advisor of Ministry of Defence.

<sup>58</sup> Judge Advocate General (Navy) is internal legal advisor of the Indian Navy.



November 2016<sup>59</sup> and has been paid MUS\$ 31.40 (₹145.63 crore)<sup>60</sup> for supply of these seven periscopes after deducting applicable LD.

Audit observed (July 2016) that due to delay of more than 34 months in processing of the case for required amendment to the contract/DP extension, eight of the ten<sup>61</sup> submarines had already completed their refits between December 2013 and May 2016 and one submarine is presently undergoing refit to be completed by January 2017. This will result in continued operations of submarine with the existing periscopes with its limitations impacting their safety, for at least 22 to 62 months till their next scheduled refits. Details of delay is as given in Table 3.9 below:

**Table-3.9: Delay in installation of periscopes on Sindhughosh class submarines**

SI No	Name of the Submarine	Delay (in months)	SI No	Name of the Submarine	Delay (in months)
1.	INS Sindhuraj	62	5.	INS Sindhukirti	22
2.	INS Sindhukesari	55	6.	INS Sindhuratna	54
3.	INS Sindhughosh	23	7.	INS Sindhudhvaj	22
4.	INS Sindhuvir	42	8.	INS Sindhuvijay	23

The Ministry, while admitting the delays in processing, stated (November 2016) that all Sindhughosh class submarines are fully operational and are being operated in a safe manner within the capability of existing equipment onboard the platform by ensuring submarine safety through alert watch-keeping, correlation with other sensors etc.

The contention of the Ministry that there was no adverse impact on the operational capability of the submarines is not tenable as the procurement of periscopes was itself undertaken in view of the fact that the existing periscopes lacked night vision/low light vision capability and had only rudimentary

<sup>59</sup> IHQ MoD (Navy) letter No.- MQ/3700/PERIS dated 14 March 2017 addressed to O/o Principal Director of Audit (Navy).

<sup>60</sup> @1 USD= ₹46.38

<sup>61</sup> One Sindhughosh class submarine had met with accident/sunk in sea on 14 August 2013 and decision on installation of periscope would be taken subsequent to salvage of the submarine.

ergonomics and monocular vision, which seriously limited the overall effectiveness of the periscopes and put excessive strain on the personnel operating the periscope. The procurement/installation of the new periscopes would have helped in overcoming these limitations onboard the submarine fleet.

Thus, undue delay of 34 months in issuing of necessary approvals by the Ministry led to delay in installation of periscopes onboard the submarines during their planned refits. Consequently, the Indian Navy was forced to exploit the Sindhughosh class of submarines with the existing periscopes with its limitations for at least 22 to 62 months till their next scheduled refits.

### **3.5 Non-installation of a mandatory system compromising the flight safety of aircraft**

**Non-availability of a critical flight safety equipment onboard the Indian Navy's and Coast Guard's aircraft, has impacted their safe operation for the past 12 years. The situation would persist for another four years due to asynchronous timelines for delivery of the equipment and its installation onboard the aircraft. Further, failure to take cognizance of de-induction of one of the aircraft fleet, resulted in excess procurement of ten equipment worth ₹5.58 crore.**

Traffic Collision Avoidance System (TCAS) is a standalone system that provides collision avoid information to the pilot.

A case for procurement of 61 TCAS was initiated (July 2009) by Integrated Headquarters, Ministry of Defence (Navy) {IHQ MoD (Navy)} and Acceptance of Necessity (AoN) was accorded by the Defence Acquisition Council (DAC) to "Buy Global"<sup>62</sup> with integration by M/s Hindustan Aeronautics Limited (HAL). Bids of two out of three vendors received in response to the Request for Proposal (RFP) (December 2010) viz., M/s ACSS,

<sup>62</sup> Buy Global- Acquisition (under the Defence Procurement Procedure) covered under the 'Buy decision'. Buy would mean an outright purchase of equipment. Based on the source of procurement, this category would be classified as 'Buy (Indian)' and 'Buy (Global)'. 'Indian' would mean Indian vendors only and 'Global' would mean foreign as well as Indian vendors. 'Buy Indian' must have minimum 30 *per cent* indigenous content if the systems are being integrated by an Indian vendor

USA and M/s Honeywell International Inc., USA, were accepted (August 2011) as technically compliant. M/s Honeywell, USA emerged (January 2012) L-1. Contract with the firm was concluded (April 2013) for supply of 61 TCAS and accessories at a cost of MUSD 7.14 (₹38.22 crore<sup>63</sup>). As per the contract, the supply of 61 TCAS was to be commenced from September 2013 and was to be completed within 44 months (*i.e.*, December 2016). The firm had supplied 46 sets of TCAS by August 2016<sup>64</sup>.

Consequent on finalisation of the firm for supply of the equipment, a commercial RFP was issued (November 2012) to M/s HAL for integration of 51 TCAS (excluding 10 spare TCAS sets) onboard the Indian Navy and Indian Coast Guard aircraft. The equipment to be integrated were reduced during commercial negotiation (November 2013) as the inventory holding of Tu-142M aircraft was reduced to four against seven due to de-induction on completion of their total technical life. A contract was concluded (November 2015) with M/s HAL for integration of 48 TCAS on 24 aircrafts each of Indian Navy and Indian Coast Guard at a cost of ₹45.84 crore, to be completed within 50 months (January 2020).

Audit examination (June 2016) revealed the following:

- The case for installation of TCAS was initiated on the basis of the International Civil Aviation Organisation (ICAO) guidelines (September 1999), which made installation of TCAS mandatory onboard the aircraft of certain categories. Acceptance of Necessity (AoN) for procurement of TCAS was accorded (February 2004) by DAC and RFP was issued (November 2004) to four firms for supply and installation. However, the commercial bids of two technically qualified vendors were rejected by Contract Negotiation Committee (CNC) as the bids did not meet the requirements of the RFP and the CNC recommended retendering, which was approved (December 2008) by the Competent Financial Authority (CFA). The Ministry of Defence took 58 months (February 2004 to December 2008) for processing the case in the first instance, *vis à vis* 19-28 months stipulated in Defence Procurement Procedure (DPP),

---

<sup>63</sup> @ 1 USD=₹53.50

<sup>64</sup> IHQ MoD (Navy)'s letter No. AH/1408/COLLISON dated 11 August 2016

thereby, resulting in a delay of 30 months. Further, Ministry took another 52 months from decision of CFA for re-tendering (December 2008) till the contract conclusion (April 2013) *vis à vis* 12-15 months stipulated in DPP, resulting in a further delay of 37 months. The case for procurement of a critical mandatory equipment, therefore, got delayed by 67 months<sup>65</sup>.

- The contract for integration of TCAS was concluded by the Ministry with M/s HAL only in November 2015, by when 40 TCAS were also scheduled to be delivered as per the contract (April 2013) for supply of TCAS. Thus, Ministry failed to synchronise the delivery of equipment with the contract for integration of TCAS onboard the aircraft. This in turn would delay the installation of TCAS by 37 months (December 2016 to January 2020).
- Out of 61 TCAS, Indian Navy procured 10 TCAS for five Tu-142M aircraft. Out of the five<sup>66</sup> Tu-142M aircraft, one aircraft was de-inducted in October 2013; another three aircraft were planned to be de-inducted by 2017 and remaining one aircraft in mid-2018. Further, the contract for integration was concluded (November 2015) for only four Tu-142M aircraft. Improper estimation of requirement coupled with delay in processing the case resulted in excess procurement of 10 TCAS worth MUSD 1.04 (₹5.58 crore).

In their reply, IHQ MoD (Navy)/Directorate of Aviation Projects Management accepted (August 2016) the delay in conclusion of contracts and non-synchronisation in the delivery of TCAS and their installation onboard the aircraft and stated that the spare TCAS sets procured for Tu-142M fleet would be utilised for IL-38SD aircraft, as these are interchangeable. They further stated (January 2017) that in view of the fact that the installation of equipment onboard Tu-142M aircraft would not have been completed by March 2017 *i.e.*, the planned date for phasing out of the aircraft fleet, the integration of TCAS on Tu-142M aircraft was put on hold to avoid unfruitful expenditure. IHQ

---

<sup>65</sup> 1<sup>st</sup> phase [30 months (58 - 28)] + 2<sup>nd</sup> Phase [37 months (52 - 15)] = 67 months

<sup>66</sup> Eight Tu-142M aircraft were inducted during 1987-88 and subsequently three aircraft were de-inducted between June 2006 and 2012.

MoD (Navy) also accepted (January 2017) that Indian Navy and Indian Coast Guard aircraft not fitted with TCAS were managed by Air Traffic Services, in a manner so that they did not hazard the other compliant aircraft and presence of such aircraft, not fitted with TCAS, in the airspace imposed restrictions and limitations towards efficient management of air traffic.

The contention of Indian Navy regarding utilisation of excess TCAS systems for IL-38SD fleet is not convincing as these aircraft are also due to be phased out by 2025 and the required quantities of TCAS for IL-38SD aircraft have also been procured from M/s Honeywell, USA.

Thus, apart from the delay of 67 months in processing the case for the procurement of TCAS, there was an additional delay of 37 months due to non-synchronisation between the delivery and integration of TCAS onboard the aircraft of Indian Navy and Indian Coast Guard. Resultantly, the aircraft fleet of Indian Navy and Indian Coast Guard have operated for the past 12 years without a flight safety aid mandated by the ICAO norms of 1999 and aircraft would be constrained to operate with the limitation till 2020. Further, failure to take cognizance of the de-induction plan of the Tu-142M aircraft, resulted in an avoidable procurement of ten TCAS, worth ₹5.58 crore.

The matter was referred to the Ministry (October 2016); their reply was awaited (March 2017).

### **3.6 Fleet tankers rendered vulnerable due to delay in fructification of offset obligation**

**Non-availability of the defence systems onboard the fleet tankers, since their delivery in 2011, rendered them vulnerable to external threats. Further, non-linking of payment with the supply/installation of vital defence systems catered for under offset clauses of the contracts for two fleet tankers, resulted in premature payment of ₹26.73 crore to the foreign vendor.**

Kavach system is a part of armament onboard the fleet tanker, which helps in defending the tanker against incoming shells and missiles, thereby adding teeth to the defensive cover of the tanker.

Ministry of Defence concluded two contracts in April 2008 and March 2009<sup>67</sup> with M/s Fincantieri, Italy, with an offset clause, for construction of two fleet tankers for Indian Navy, at a cost of Euro 138.55 million each. In addition to the main contracts, two offset contracts<sup>68</sup> at 30 *per cent* of the main contracts amounting to Euro 41.563 million each were also signed with M/s Fincantieri, wherein the firm was to purchase from the Unique Vendor *i.e.*, Ordnance Factory Board (OFB), AK-630M (Gun) and Kavach Mod-II systems, to be fitted on the fleet tankers. M/s Fincantieri, in turn, concluded (November 2009) a contract with OFB for the supply of two Kavach systems at a cost of ₹26.73 crore.

The main contracts, *inter alia*, provided that in case OFB fails to fulfil their commitment for the supply of items, then M/s Fincantieri would deliver the tankers without these items and would be absolved of the warranty period and any outstanding liability thereof, on installation of the items to be supplied by OFB.

M/s Fincantieri delivered (January 2011 and September 2011) both fleet tankers to Indian Navy as scheduled without Kavach MOD-II system due to inability of OFB to supply the same. Accordingly, payment of ₹26.73 crore for supply and installation of Kavach system was made (January & June 2012) to M/s Fincantieri in absence of provision in the contracts to withhold the stage payment for non-supply of the Kavach system.

In response to an audit query (May 2015) regarding acceptance of fleet tankers without Kavach systems, Integrated Headquarters, Ministry of Defence (Navy) {IHQ MoD(N)} stated (September 2015) that the development of Kavach system was under progress at the time of conclusion of contracts and in the event of delay in delivery of the system by OFB, linking of Kavach system to any of the milestones would have had an adverse effect on the payment to

---

<sup>67</sup> The contract in March 2009 was concluded under option clause of the contract concluded in April 2008.

<sup>68</sup> In case of outright foreign purchase of ₹300 crore and above, foreign suppliers are required to procure products at least 30 *per cent* of the contract value from the Indian firms. The offset contracts were concluded in April 2008 and in March 2009.

M/s. Fincantieri and the ship production schedule, thus stalling the overall construction of the ship.

Audit further observed (October 2015) that lacunae in the contracts (April 2008 and March 2009) wherein payments were not linked with the supply and installation of Kavach systems, resulted in release of ₹26.73 crore to M/s Fincantieri, which made a payment of ₹12.03 crore<sup>69</sup> to OFB only in August 2015 and the balance of ₹14.70 crore was still held by the firm. The fleet tankers were also rendered vulnerable to security threats from enemy ships for over four years due to non-installation of Kavach systems.

IHQ MoD (Navy) stated (January 2017) that installation of Kavach system onboard one fleet tanker had commenced and was likely to be completed by March 2017, whereas it was likely to be installed on another fleet tanker within the scheduled refit of the ship between January and September 2017.

In sum, the fleet tankers remained vulnerable to security threat from enemy ships for over four years. Besides, lacunae in contractual provisions resulted in premature payment of ₹26.73 crore to M/s. Fincantieri, a part of which (₹14.70 crore) was still with the firm.

The matter was referred to the Ministry (September 2016); their reply was awaited (March 2017).

### **3.7 Deficient small arms practice firing by Naval Officers in Delhi Area**

**All Indian Navy personnel are required to have working knowledge of handling all types of small arms. It was noticed that the coverage of Naval Officers in practise firings was meagre in Delhi Area creating concerns about their ability to handle small arms.**

All Indian Navy personnel are required to have working knowledge to handle all types of small arms. Integrated Headquarters Ministry of Defence (Navy) {IHQ MoD (Navy)} had instituted (May 2010) measures like continuation of training, additional training on simulators for small arms training and grading

<sup>69</sup> Being 90 *per cent* of one system delivered and balance 10 *per cent* to be paid on Set To Work (STW) and Harbour Acceptance Trials (HAT)

at training schools and establishments. The Commands were to take up cases for necessary infrastructure augmentation, wherever necessary.

The Annual Practice Allowance (APA) for small arms during *ab initio* training and for ships and establishments was notified by Naval Headquarters in December 1978 as amended in July 2011, whereby, each Naval Officer is required to perform a practice firing of 65 rounds of 5.56mm Ball ammunition and 40 rounds of 9mm Ball ammunition in a year.

Station Commander (Navy), Delhi Area (INS India) is responsible for conduct of small arms firing of all Officers and Sailors posted in Delhi Area.

In response to an audit query (November 2014), INS India stated (September 2015) that there is no dedicated firing range of Indian Navy in Delhi due to constraints of land and the Navy is fully dependent on Army for use of firing range.

Audit examined (August 2016) implementation of revised APA, in respect of Naval Officers in Delhi Area during the period from 2012-13 to 2015-16 and found deficient participation of officers as well as deficient practice firing by the participating officers, as given in Table 3.10 below:

**Table-3.10: Details of practice firing at Delhi area**

Sl. No.	Period	Borne strength	Officers participated	Deficiency (in per cent)	Details of firing by the participating Officers					
					5.56 mm Ball ammunition			9 mm Ball ammunition		
					Rounds required to be fired	Rounds actually fired	Deficiency (in per cent)	Rounds required to be fired	Rounds actually fired	Deficiency (in per cent)
A	B	C	D	E	F	G	H	J	K	L
1	2012-13	1,167	02	99.83	130	80	38.46	80	20	75.00
2	2013-14	1,226	16	98.69	1,040	172	83.46	640	672	-5.00
3	2014-15	1,240	56	95.48	3,640	536	85.27	2,240	715	68.08
4	2015-16	1,261	106	91.59	6,890	935	86.43	4,240	730	82.78

APA for 5.56 mm = 65 rounds  
APA for 9 mm = 40 rounds

An analysis of the data tabulated above reveals the following:

- Deficiency in participation of Officers for practice firing in Delhi Area,



**Report No. 20 of 2017 (Navy and Coast Guard)**

during the years 2012-13 to 2015-16, ranged between a staggering 91.59 *per cent* and 99.83 *per cent*;

- The practice firing of 5.56 mm Ball ammunition by the participating officers was deficient. The deficiency ranged between 38.46 *per cent* and 86.43 *per cent*; and
- Deficiency in practice firing of 9 mm Ball ammunition by the participating officers ranged between 68.08 *per cent* and 82.78 *per cent*. However, during 2013-14, the practice firing of 9 mm Ball ammunition was performed by the participating officers as per the scales prescribed.

INS India stated (September 2016) that they had neither any small arms simulator for practice firing nor any case was projected by them for augmentation of necessary infrastructure in the past. INS India cited constraint of space as a reason for not proposing the case for augmentation of necessary infrastructure. They, however, added that the number of officers participating in the firings have increased over the years.

The explanation offered by INS India is not tenable because in their capacity as Station Commander (Navy), Delhi Area they are responsible for conduct of small arms firings of all officers posted in Delhi Area and no justification was provided for their inaction as to the availability of simulator/infrastructure to enable the requisite firing as mandated in the APA. Reasons for deficiency in practice firing by the participating officers *vis à vis* the scales were also not clarified. Further, though there has been increase in officers participating in the firings over the years, deficiency in coverage of Naval Officers was still (2015-16) above 90 *per cent*.

Thus, small arms practice firings by Naval Officers was meagre *vis à vis* as mandated in the APA and may impact the ability of Naval Officers to handle small arms.

The matter was referred to the Ministry (December 2016); their reply was awaited (March 2017).

### **3.8 Unwarranted procurement of aero-engines for a helicopter fleet**

**Indian Navy, while placing the order for procurement of four aero-engines for two helicopters damaged in an accident, did not take into consideration one helicopter which was declared Beyond Economical Repairs (BER) before the conclusion of the contract and 16 aero-engines received post-overhaul. Although, these excess engines were absorbed in subsequent procurement of five helicopters, BER declaration of another helicopter resulted in inventory holding of three aero-engines more than its authorisation and unproductive expenditure of ₹16.62 crore on the procurement of these three excess aero-engines.**

The Indian Navy inducted nine KA-31 helicopters (IN 561 to 569) between April 2003 and May 2004. Each helicopter is fitted with two aero-engines. Indian Navy had an inventory of 27 aero-engines for these helicopters, including one aero-engine per helicopter being maintained as reserve.

Of the nine KA-31 helicopters held in the inventory of the Indian Navy, three helicopters (KA 562, 564 and 566) suffered damages to the airframes/aero-engines in different accidents between July and November 2008 and four of the aero-engines fitted onboard helicopters (KA 562 and 564) were declared (December 2009) Beyond Economical Repairs (BER).

Thereafter, one of the helicopters (KA-564) was also declared BER in October 2010. Integrated Headquarters Ministry of Defence (Navy) {IHQ MoD (Navy)}/Directorate of Naval Air Material (DNAM), in November 2010, projected the requirement to the Ministry for undertaking repairs/overhaul of two helicopters. Based on the cost analysis, one more helicopter (KA-562) was declared BER in August 2012, while the case for repair/overhaul of the third helicopter (KA-566) is still in progress with the Ministry (January 2017). During the period between March 2012 and August 2012, five more KA-31 helicopters were inducted into Indian Navy with ten aero-engines installed and two aero-engines as reserve.

IHQ MoD (Navy)/DNAM initiated (December 2009) the procurement of four aero-engines against the four aero-engines of two KA helicopters (KA 562 and 564) declared BER (December 2009). Thereafter, a contract was concluded (April 2011) with M/s Rosoboronservices (India){ROS (I)} for the supply of four aero-engines at a total cost of ₹22.62 crore. These four aero-engines were delivered in December 2011. Of these, two aero-engines worth ₹11.31 crore were lying idle for periods ranging from 34 to 44 months viz., up till October 2014 and August 2015 respectively.

Meanwhile, IHQ MoD (Navy)/DNAM also placed (March and November 2009) two repair orders on M/s ROS (I) for undertaking overhaul of 17 aero-engines at a total cost of ₹17.57 crore. Against these, sixteen aero-engines were received back between December 2010 and February 2011 and one aero-engine was withdrawn from service due to severe damage.

Audit noticed (July 2016) that IHQ MoD (Navy)/DNAM, before conclusion of the contract (April 2011), for procurement of four aero-engines for the two damaged helicopters, overlooked the fact that one helicopter had already been declared BER in October 2010. Further, the OEM specialists were assessing the damage to the other two helicopters also. Moreover, Indian Navy had received sixteen aero-engines post-overhaul between December 2010 and February 2011. However, no action was taken to stall the procurement of the four new aero-engines. Audit also noticed that though IHQ MoD (Navy)/DNAM is the nodal directorate<sup>70</sup> for all the activities relating to repair, overhaul of aircraft/helicopters, aero-engines; procurement of spares and rotables for the aircraft in service with the Indian Navy, yet they failed to appreciate the fact that the procurement of four new aero-engines would have had hardly any impact on improving the flight worthiness of damaged helicopters as these had suffered extensive airframe damages. Though, Indian Navy required 36 aero-engines (24 onboard plus 12 as reserve) for optimum exploitation of 12 helicopters (two were declared BER in October 2010 and

---

<sup>70</sup> DNAM was trifurcated on 1<sup>st</sup> August 2013 into three different entities with different sets of duties.

August 2012, from the original fleet of nine helicopters), it is holding 39 aero-engines (January 2017), thereby, exceeding the inventory by three aero-engines.

The Ministry justified (January 2017) the procurement of four aero-engines (during the period April 2011 to December 2011) on the grounds that Indian Navy held 13 helicopters, which had a requirement of 39 aero-engines. The Ministry's contention is not convincing because, as of October 2010, Indian Navy was holding only eight helicopters (nine procured initially in 2003-2004 less one helicopter declared BER in October 2010) including the one awaiting decision on BER/repair. Since the contract for four aero-engines was entered into in April 2011, there was scope for Indian Navy to take into account declaration of one helicopter as BER in October 2010 and accordingly reduce the size of the order by three engines. By August 2012, the fleet was reduced to seven due to one more helicopter having been declared BER. However, in the same month, five new helicopters along with two reserve aero-engines (keeping in view the three engines that had been rendered surplus due to declaration of one helicopter as BER) were inducted making the total inventory of helicopters to 12. However, since, around this time another helicopter was under the process of being declared as BER reducing the requirement of engines by three, Indian Navy could have avoided procuring two aero-engines for reserve. For operational exploitation of 12 helicopters, Indian Navy had an authorisation of 36 aero-engines (24 onboard and 12 as reserve), however, Navy was holding 39 aero-engines, thereby, exceeding the inventory by three. Such situation emerged due to avoidable procurement of three out of four new aero-engines ordered in April 2011. This situation could have been partly mitigated by not ordering two reserve engines while ordering five helicopters, but this was not done.

Thus, while placing the order for four new aero-engines, Indian Navy failed to take into cognizance BER helicopter (October 2010). This in turn resulted into inflated inventory of aero-engines to the extent of three engines worth ₹16.62 crore. Of the four aero-engines procured against BER helicopters, two aero-engines worth ₹11.31 crore were lying idle for the periods ranging from 34 to 44 months up till October 2014 and August 2015 respectively.

### **3.9 Avoidable procurement and installation of Mobile Satellite Service Terminal for an aircraft**

**Failure of the Indian Navy to take cognizance of the de-induction plan of Tu-142M aircraft fleet, resulted in procurement of an excess Mobile Satellite Service (MSS) terminal for an aircraft at ₹0.95 crore. Further, de-induction of another three aircraft by 2017 would render installation of MSS terminals on these aircraft, largely unfruitful.**

The Long Range Maritime Reconnaissance (LRMR) requirements of the Indian Navy were met by five IL-38SD and five<sup>71</sup> Tu-142M aircraft inducted in 1977 and 1987 respectively.

In order to augment the existing communication facility for securing data communication on these aircraft, Indian Navy concluded (December 2012) a contract with M/s Avantel, Hyderabad for ten Mobile Satellite Service (MSS) terminals at a unit cost of ₹0.95 crore. The technical life of MSS terminals is 10 years and all 10 MSS terminals were delivered (January 2013) well within the scheduled delivery period *i.e.* by December 2013.

Audit observed (August 2016) that one Tu-142M aircraft was de-inducted in October 2013; another three Tu-142M aircraft were planned to be de-inducted by 2017 and remaining one aircraft by mid-2018. Further, one MSS terminal costing ₹0.95 crore remained idle in stock since its receipt (January 2013).

The Ministry stated (January 2017) that out of the total five MSS terminals procured for five Tu-142M aircraft, one aircraft was to undergo overhaul in 2013-14 with life extension up to 2018-19. The aircraft was, however, drawn down from service in October 2013 and there was no firm de-induction plan formulated at the time of processing the case for procurement of MSS terminals. Hence, there was no overlooking of de-induction plan of Tu-142M fleet while procuring MSS terminals. The Ministry further stated that the combined factors of increased cost, reduced operational time availability of aircraft post overhaul and induction of P8-I aircraft as replacement, contributed towards decision to withdraw the proposal for overhaul of the Tu-142M aircraft. The Ministry also added that the fifth terminal earmarked

<sup>71</sup> Eight Tu-142M aircraft were inducted during 1987-88 and subsequently three aircraft were de-inducted between June 2006 and June 2012.

for the Tu-142M aircraft would be effectively utilised as float for IL-38SD aircraft as they will remain operational till 2022-23.

The reply of the Ministry is not convincing because any procurement decision for Tu-142M aircraft should have been taken once overhaul/life extension of the aircraft was confirmed. Moreover, the item was easily available with the Indian firm as is evident from completion of supply within one month against scheduled delivery period of 12 months provided in the supply order. Further, the justification regarding use of the excess terminal as float is not tenable as procurement proposal did not envisage for float, as per the laid down norms. Besides one excess MSS terminal worth ₹0.95 crore, the fact that three Tu-142M aircraft are likely to be de-inducted by 2017 renders the procurement of terminals for the aircraft fleet, at the fag-end of its residual life, largely unfruitful.

### **3.10 Procurement of weather radars for Dornier aircraft**

**Non-supply of a critical component viz., display units, as part of procurement of weather radars impacts the operational exploitation of the Dornier aircraft fleet.**

The weather radar enables the pilot to avoid bad weather by detection of clouds and clutter in adverse weather conditions. This is a critical role equipment, which has to be available in full serviceable state on all aircraft. In order to obviate any AOG<sup>72</sup> situation, the serviceability of weather radar system is considered essential.

Based on INS Hansa, Goa requirement (September 2009) for replacement of existing obsolete and unsupportable weather radars on 15 Dornier aircraft along with five radars as float<sup>73</sup>, the Directorate of Naval Air Material (DNAM) {now renamed<sup>74</sup> as Directorate of Air Logistics Support (DALs)}, Integrated Headquarters Ministry of Defence (Navy) {(IHQ MoD (Navy))

<sup>72</sup> AOG-Aircraft on Ground

<sup>73</sup> Float – Reserve held for maintaining unserviceable Radars

<sup>74</sup> DNAM- Erstwhile DNAM was trifurcated on 01 August 2013 into three different Directorates viz., Directorate of Air Logistics Support (DALs), Directorate of Aircraft System Engineering (DASE) & Directorate of Air Projects and Plan (DAPP).

placed (March 2010) a supply order (SO) on M/s Hindustan Aeronautics Limited (HAL), Kanpur for procurement/installation of 15 weather radars onboard 15 Dornier aircraft and five radars as float at a cost of ₹8.14 crore.

M/s HAL completed (between August 2010 and January 2014) fitment of 15 weather radar systems on these 15 Dornier aircraft. However, one of the aircraft (IN-222) was signaled out in September 2013 without display unit. The deficiency of the aircraft (IN-222) was made good only after a serviceable display unit was retrieved from another Dornier aircraft, whereas one display unit fitted on another Dornier aircraft was rendered Beyond Economical Repairs (BER) in November 2013. HAL, Kanpur requested (October 2015) IHQ MoD (Navy) that five display units valuing ₹0.19 crore, forming a part of five sets of floats, be deleted from the SO, as they were not in a position to supply the item. DALS IHQ MoD (Navy) submitted (May 2016) a proposal for deletion of the item from the SO and the decision was pending (August 2016)<sup>75</sup>.

Audit scrutiny (October 2013/July 2016) of the procurement revealed that the procurement of 15 weather radars for installation onboard Indian Navy Dorniers and five radars as floats of IHQ MoD (Navy), in March 2010, was costlier by ₹0.76 crore *vis à vis* procurement made by Indian Coast Guard from the same firm in same period (June 2010). Further, M/s HAL fitted the display units, onboard seven Dornier aircraft of Indian Coast Guard (ICG) between February 2011 and September 2013 against the contract (June 2010) and also replaced, the initially fitted five Cat 'B' display units free of cost, on the Dornier aircraft of ICG with the Original Equipment Manufacturer (OEM) {*i.e.*, M/s Avidyne} made display units after a change order was issued to the contract (June 2010). However, five sets of floats supplied by HAL to the Indian Navy were without display units as the OEM had expressed (October 2015) their inability to supply the same. Thus, two Dornier aircraft of the Indian Navy (IN) were without dedicated display units, thereby, affecting the efficacy of Dornier aircraft.

---

<sup>75</sup> IHQ MoD (Navy) letter No.SM/09/A/D/C/4028 dated 1 September 2016.

The Ministry stated (March 2017) that the display units were highly reliable and common to other aircraft of the Indian Navy and the float were 'interchangeable' across Naval fleet. They, however, admitted that availability of float is definitely better to sustain high serviceability of aircraft fleet. The Ministry added that non-supply by M/s HAL was not due to any failure on the part of the firm as the item could not be supplied due to obsolescence and their non-availability in world market.

The reply of the Ministry is not convincing as one display unit was rendered BER (November 2013) even before completion of supplies (January 2014) under the Supply Order and two Dornier aircraft were without display units for which there was no float. Further, usage of a different display unit would require structural modification, involving additional time and cost elements which could lead to AOG situation.

Thus, unserviceability/non-availability of display units onboard two Dornier aircraft coupled with lack of float impacts operational exploitation of aircraft fleet, thereby defeating the purpose of creating float at a cost of ₹1.19 crore. Besides, the procurement (March 2010) by IHQ MoD (Navy) was costlier by ₹0.76 crore *vis à vis* the procurement made by the ICG from the same firm during the same period.

### **3.11 Avoidable expenditure on procurement of rice**

**In deviation from the existing policy on provisioning and procurement of dry rations, Indian Navy resorted to local purchase of rice for the naval contingent in Delhi Area, thereby, incurring extra expenditure of ₹0.89 crore in procurement of rice.**

As per the extant policy, all units of three arms of the Defence Services have to obtain non-availability certificate (NAC) from the Army Service Corps (ASC) Depot before resorting to local purchase (LP) of dry rations. INS India is the base depot of the Indian Navy in Delhi and caters to ration requirements of entire naval contingent at Delhi Area through ASC Depot, Delhi Cantt.

Audit observed (July 2016) that INS India had proposed for delinking of provisioning and procurement of ration items from ASC for Delhi Naval



Station; akin to other Naval Stations viz., Mumbai, Visakhapatnam and Kochi. However, the proposal was not approved. Further, between 2011-12 and 2015-16, INS India indented and received 1,49,600 Kg rice from ASC Depot, Delhi Cantt. at ₹22.13 per Kg and locally purchased 4,80,000 Kg rice during the corresponding period, at an average price of ₹40.75 per Kg on the grounds that rice supplied by ASC was in sacks of 50 Kg against the requirement of 5 Kg pack. The local purchase of rice was resorted to without obtaining the requisite NAC from the ASC Depot, resulting in extra expenditure of ₹0.89 crore. The PIFA<sup>76</sup> (Navy) had been agreeing to the local purchase of rice without insisting on the NAC from ASC (Depot). Indian Navy stated (July 2016) that rice received from ASC Depot was in bigger packing and to get it repacked into small packing, as per the entitlement of personnel, was tedious, time consuming and unhygienic. They further reaffirmed (August 2016) that rice from ASC had always been received in 50 Kg bags rather than in 5 Kg packs.

The contention of Indian Navy is not tenable as the extant policy requires the Defence Services (*i.e.*, Army, Navy and Air Force) to meet their dry ration requirements through ASC in the first place. As such, provisioning of dry rations by the Indian Navy, in deviation from the extant policy, resulted in extra expenditure of ₹0.89 crore on procurement of rice.

The matter was referred to the Ministry (December 2016); their reply was awaited (March 2017).

---

<sup>76</sup> PIFA- Principal Integrated Financial Advisor

## CHAPTER IV: MINISTRY OF DEFENCE- INDIAN COAST GUARD

### 4.1 Irregular payment of ₹5.23 crore as Foreign Exchange Rate Variation to a shipyard

**Indian Coast Guard authorities made a payment of ₹5.23 crore to M/s Goa Shipyard Limited, Goa as Foreign Exchange Rate Variation due to misinterpretation of contractual provisions.**

As per Defence Procurement Procedure (DPP) 2011, the exchange rate variation (ERV) clause is not applicable, in case delivery period for imported content is extended unless the reasons for extension are attributable to the buyer.

In pursuance of the Government of India, Ministry of Defence sanction (May 2012), Coast Guard Headquarters (CGHQ), New Delhi concluded a contract (May 2012) with M/s Goa Shipyard Limited (GSL), Goa for construction and delivery of six Offshore Patrol Vessels (OPVs) at a cost of ₹1,979.61 crore. The ERV provision in conformity to the DPP-2011 was incorporated in the contract. Accordingly, M/s GSL, Goa placed two purchase orders (POs) (August 2012) on M/s Wartsila, France at a cost of €1,637,455<sup>1</sup> each, for procurement of an item 'Stern Gear'<sup>2</sup> for construction of two OPVs with deliveries in September and December 2013, extended thrice and twice respectively. The Stern Gears were delivered in April 2014 and M/s GSL, Goa levied liquidated damages (LDs) on the firm for the delays.

Audit noticed (March 2016) that as per the POs, payment was to be made to M/s Wartsila, France in two stages viz; Stage-I and Stage-II i.e., 10 and 90 per cent respectively and M/s GSL, Goa (between March 2014 and June 2014) paid M/s Wartsila, France an amount of €1,391,836.75 each against the two purchase orders (Stage-II payments) for the 'Stern Gears' as per the prevailing foreign exchange rate (FE was between ₹80.17 and ₹85.01 per Euro). As the base exchange rate fixed in the contract was ₹66.44 per Euro, M/s GSL, Goa raised a claim on Indian Coast Guard (ICG) for reimbursement of additional

<sup>1</sup> € is symbol for Euro currency

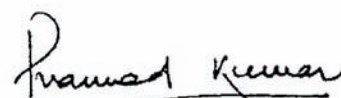
<sup>2</sup> Stern Gear- is a critical equipment, which enables propulsion of a vessel/ship.

₹4.58 crore (Stage-I and Stage-II payments), owing to ERV. The actual payment made by the ICG to M/s GSL, Goa against this claim was ₹4.50 crore. Audit sought (March/August 2016) reasons for this payment as the delays in supplying the 'Stern Gears' were attributable to the firm and payment of ERV was in deviation from terms of the contract. Audit also found that payment of ERV of ₹0.73 crore (Stage-I) was made by the ICG to M/s GSL, Goa for remaining four vessels.

CGHQ, New Delhi, accepted (October 2016) the contention of audit and stated that the interpretation of the ERV clause by the Coast Guard Refit and Production Superintendent (CGRPS), Goa was not in line with the intent of the contract and accordingly, CGRPS, Goa had been directed (October 2016) to recover ERV wrongly reimbursed to Ms GSL, Goa. They further, stated that ERV bills against Stage-II presented by M/s GSL, Goa against the other four vessels were also not being cleared for payment.

Thus, incorrect interpretation of contractual clause by the ICG led to an overpayment of ₹5.23 crore<sup>3</sup> to M/s GSL, Goa on account of ERV.

The matter was referred to the Ministry (December 2016); their reply was awaited (March 2017).



**(PRAMOD KUMAR)**

**Principal Director of Audit (Navy)**

**New Delhi**

**Dated: 4 May 2017**

**Countersigned**



**(SHASHI KANT SHARMA)**

**Comptroller & Auditor General of India**

**New Delhi**

**Dated: 5 May 2017**

---

<sup>3</sup> ₹5.23 crore = ₹4.50 crore + ₹ 0.73 crore



# ***ANNEXURE***

## Annexure-I

(Referred to in Para 2.3.1)

**Provisioning Formula:** The provisional and final procurement quantity (PPQ and FPQ) is calculated using the following formula:

$$PPQ = ACL (CCU-CCM+PLT/12) + MSL- S-DI+DO$$

$$FPQ = PPQ + POER$$

The various terms are explained below:

ACL= Annual Consumption Level. This is calculated on the weighted average of actual consumption in the last three years, with weights 3,2,1.

CCM= Category Co-efficient Minimum Stock Level.

CCU= Category Co-efficient Upper Stock Level.

CCM and CCU have different numerical value between 1 to 2 and 2.1 to 3.9 respectively based on their VED and ABC Categorization of nine types. It was provided that till pending categorization of items, CCM is taken as 1.2 and CCU as 3.0 for all items.

MSL = Minimum Stock Level =  $ACL*CCM$

USL = Upper Stock Level =  $ACL*CCU$

PLT = Procurement Lead Time (In Months)

S= Stock in hand (Present Stock Position)

DI = Dues in, DO = Dues Out

The Controller of Material Planning (CMP) then subjects all the items for which PQ is positive (PPQ) to a review. The planner vets the PPQ and increases or reduces the quantity by an amount, which is termed as Provisioning Offer Expert Review/Value (POER). The FPQ (Final Provisioning Quantity) thus arrived at is to be indented for procurement.

Further, as per Para 5.45 of the MPM, modification of PPQ to FPQ by adding or subtracting POER is a deliberate step which must be recorded by the provisioning officer using the following code:

- R - RPP forecast that is considered reasonable
- N- New Item
- F- Forecast Future Routines
- O-Obsolescence anticipation

**Annexure-II**

*(Referred to in Para 2.3.1)*

Audit analysis (August 2015) found that the Provisioning Formula to arrive at PPQ has intrinsic mathematical error as explained below:

PPQ = ACL (CCU-CCM+PLT/12) + MSL- S-DI+DO, in this formula the controlling variables are ACL, CCU, CCM and PLT. The other variables like Stock (S), Dues-In (DI) and Dues-Out (DO) are only making adjustment in provisional procurement quantities based on situation at the time of review.

Thus, if we open the bracket and replace MSL with its value in terms of ACL and CCM we get,

$$PPQ = ACL \times CCU - \underline{ACL \times CCM} + ACL \times PLT/12 + \underline{ACL \times CCM} - S - DI + DO$$

$$= ACL \times CCU + ACL \times PLT/12 + S - DI + DO \quad (\text{Since } MSL = ACL \times CCM)$$

Therefore, it is clear that due to the aberration i.e., cancellation of MSL (= ACL x CCM), the PPQ is solely based only on the CCU and Lead Time. The value of CCU ranges from 2.1 to 3.9. Thus, PPQ generated would be as under:

Type of Store	PLT	PPQ	
		If CCU= 2.1	If CCU= 3.9
Naval Store	12 months	ACLx2.1+ACLx12/12=3.1ACL	ACLx3.9+ACLx12/12=4.9 ACL
E&SP – Non Russian	18 months	ACLx2.1+ACLx18/12=3.6ACL	ACLx3.9+ACLx18/12=5.4 ACL
E&SP- Russian	24 months	ACLx2.1+ACLx24/12=4.1ACL	ACLx3.9+ACLx24/12=5.9 ACL

The system generated provisional procurement quantity would be between 3.1 to 4.9 ACL for Naval Store, 3.6 to 5.4 ACL for Non-Russian stores and 4.1 to 5.9 ACL for Russian Stores. Thus, the automated system generates PPQ equivalent to 3 to 6 year's annual consumption, defeating the very purpose of automation.

**Annexure-III**

(Referred to in Para 2.3.1)

Name of the MOs	Review Serial No.	No. of Items reviewed	Qty. PQ Provisional			Changes made by EV at Stage-I (Qty. EV) in system generated PPQ					Changes made by EV Consolidator at Stage-2 (Qty. EV Cons)				
			+ve PPQ	Zero PPQ	-ve PPQ	Reduction in PPQ		Enhancement in PPQ		No. of changes made in PPQ	Reduction in PPQ		Enhancement in PPQ		No. of changes made in PPQ
						No. of cases	Range of Qty. reduced	No. of cases	Range of Qty. enhanced		No. of cases	Range of Qty. reduced	No. of cases	Range of Qty. enhanced	
<b>MO (MB)</b>	20,126	30,6152	17,343	1,40,776	1,48,033	6,189	1 to 19,529	2,350	1 to 485	8,539	10,855	1 to 7,470	225	1 to 371	6,263
<b>MO (V)</b>	20,117	12,4874	12,159	52,490	60,225	8,671	1 to 12,000	1,340	1 to 2,135	2,148	2,418	1 to 8,700	61	1 to 203	9,680
<b>MO (K)</b>	20,144	21,065	3,709	14,582	2,774	3,333	1 to 5,10,901	155	1 to 13,846	221	370	1 to 1,92,054	10	4 to 1390	3,329
<b>MO (KW)</b>	20,136	1,18,916	2,251	1,12,009	4,656	728	1 to 1,200	38	1 to 11	1,485	1,290	1 to 3,501	08	1 to 180	953

Source: ILMS Data provided by IHQ MoD (Navy)

Note- The first four digits in review serial column represents year of review and the fifth digit represents the serial review in that particular year.



**Annexure-IV**

(Referred to in Para 2.3.4.1)

**MO, Mumbai**

Category	No. of Items in Inventory	No. of serviceable items in inventory	No. of serviceable Items with ACL>0, LPP>0	Value of Annual Consumption		
				Below ₹ 50,000	Between ₹ 50,000 to ₹ 5 Lakh	Above ₹ 5 Lakh
A	6,136	4,703	2,751	1,188	1,087	476
B	17,232	15,337	6,441	4,708	1,538	195
C	4,54,534	4,35,708	63,930	56,615	5,784	1,531
<b>Total</b>	<b>4,77,902</b>	<b>4,55,748</b>	<b>73,122</b>	<b>62,511</b>	<b>8,409</b>	<b>2,202</b>

**MO, Visakhapatnam**

Category	No. of Items in Inventory	No. of serviceable items in inventory	No. of serviceable Items with ACL>0, LPP>0	Value of Annual Consumption		
				Below ₹ 50,000	Between ₹ 50,000 to ₹ 5 Lakh	Above ₹ 5 Lakh
A	4,442	4,241	2,100	983	650	467
B	41,775	41,487	9,766	7,195	2,089	482
C	2,96,266	2,93,176	73,757	61,266	9,482	3,009
<b>Total</b>	<b>3,42,483</b>	<b>3,38,904</b>	<b>85,623</b>	<b>69,444</b>	<b>12,221</b>	<b>3,958</b>

**MO, Kochi**

Category	No. of Items in Inventory	No. of serviceable items in inventory	No. of serviceable Items with ACL>0, LPP>0	Value of Annual Consumption		
				Below ₹ 50,000	Between ₹ 50,000 to ₹ 5 Lakh	Above ₹ 5 Lakh
A	1,316	1,291	751	333	304	114
B	5,289	5,263	1,978	1,565	381	32
C	70,878	70,585	18,216	16,026	1,821	369
<b>Total</b>	<b>77,483</b>	<b>77,139</b>	<b>20,945</b>	<b>17,924</b>	<b>2,506</b>	<b>515</b>

**MO, Karwar**

Category	No. of Items in Inventory	No. of serviceable items in inventory	No. of serviceable Items with ACL>0, LPP>0	Value of Annual Consumption		
				Below ₹ 50,000	Between ₹ 50,000 to ₹ 5 Lakh	Above ₹ 5 Lakh
A	2,561	2,551	1,474	973	400	101
B	4,911	4,900	2,871	1,928	725	218
C	39,700	39,577	20,115	17,408	2,301	406
<b>Total</b>	<b>47,172</b>	<b>47,028</b>	<b>24,460</b>	<b>20,309</b>	<b>3,426</b>	<b>725</b>

**Annexure-V**

(Referred to in Para 2.3.4.1)

**MO, Mumbai**

Category	Total No. of moving serviceable items	Percentage of Total Inventory	Total Annual Consumption Value (ACV) =(ACL*LPP) (₹ in Crore)	Percentage of ACV of total inventory in each category
A	4,703	1.03	342.51	29.75
B	15,337	3.37	58.15	5.05
C	4,35,708	95.60	750.60	65.20
<b>Total</b>	<b>4,55,748</b>	<b>100</b>	<b>1,151.27</b>	<b>100</b>

**MO, Visakhapatnam**

Category	Total No. of moving serviceable items	Percentage of Total Inventory	Total Annual Consumption Value (ACV) =(ACL*LPP) (₹ in Crore)	Percentage of ACV of total inventory in each category
A	4,442	1.30	180.15	13.01
B	41,775	12.20	128.20	9.26
C	2,96,266	86.50	1,075.95	77.73
<b>Total</b>	<b>3,42,483</b>	<b>100</b>	<b>1,384.30</b>	<b>100</b>

**MO, Kochi**

Category	Total No. of moving serviceable items	Percentage of Total Inventory	Total Annual Consumption Value (ACV) =(ACL*LPP)(₹ in Crore)	Percentage of ACV of total inventory in each category
A	1,316	1.70	30,21,87,493.60	19.97
B	5,289	6.83	15,64,86,657.92	10.34
C	70,878	91.47	1,05,46,16,354.86	69.69
<b>Total</b>	<b>77,483</b>	<b>100</b>	<b>1,51,32,90,506.38</b>	<b>100</b>

**MO, Karwar**

Category	Total No. of moving serviceable items	Percentage of Total Inventory	Total Annual Consumption Value (ACV) =(ACL*LPP) (₹ in Crore)	Percentage of ACV of total inventory in each category
A	2,561	5.43	28,08,43,236.17	13.26
B	4,911	10.41	6,51,18,4055.29	30.75
C	39,700	84.16	1,18,56,09,261.19	55.99
<b>Total</b>	<b>47,172</b>	<b>100</b>	<b>2,11,76,36,552.65</b>	<b>100</b>

**Annexure-VI**

*(Referred to in Para 3.1.3.5)*

<b>Sl. No.</b>	<b>Name of the ship</b>	<b>Date of accident</b>	<b>Work up due prior to accident</b>
1.	INS Pralaya	2 August 2007	February 2007
2.	FAC 84	12 January 2008	February 2005
3.	INS Jalshwa	1 February 2008	June 2007 <i>(Month of commissioning)</i>
4.	INS Godavari	23 January 2009	March 2007
5.	INS Agray	17 July 2009	October 2005
6.	INS Sarvekshak	4 January 2010	September 2009
7.	INS Delhi	26 November 2010	April 2009
8.	INS Deepak	30 May 2011	January 2011 <i>(Month of commissioning)</i>
9.	INFAC 83	8 October 2012	October 2010
10.	INS Viraat	22 September 2013	January 2012
11.	INS Tarkash	19 December 2013	November 2012
12.	INS Talwar	23 December 2013	January 2013
13.	INS Betwa	8 January 2014	August 2013
14.	INS Vipul	23 January 2014	November 2011
15.	INS Airavat	30 January 2014	November 2012
16.	INS Kora	31 October 2014	January 2012

**Annexure-VII**

*(Referred to in Para 3.2.2.1)*

Sl. No.	GT No.	Received Date	Overhaul from	Overhaul up to	Merged in stock after completion of trials	Time taken for merging into stock	Time taken in addition to the prescribed time of 12 months
	(a)	(b)	(c)	(d)	(e)	(f)= (e)-(c)	(g) =(f)-12
1	3,518	15-04-08	08-09-08	11-02-10	27-05-11	33m	21m
2	3,521	09-04-08	10-10-09	25-08-11	25-11-11	25m	13m
3	3,345	01-09-99	24-11-07	20-10-11	16-04-12	53 m	41m
4	3,828	11-04-08	24-11-08	09-12-09	01-11-12	47 m	35m
5	3,517	21-11-11	24-11-11	01-03-13	18-06-13	19m	7m
6	3,415	23-11-11	25-01-12	16-09-13	30-01-14	24m	12m
7	3,519	24-04-08	29-03-10	21-09-12	20-01-16	70m	58m

*Source: Information provided by INS Eksila vide No.300/PPC/04(i) dated 21 Sep.16*

**Annexure-VIII**

(Referred to in Para 3.2.2.1)

**Delay in overhaul due to trials/revisia**

**(A) M3E GT**

S.No	GT No.	Overhaul from	Overhaul upto	Merged in stock after completion of trials	Time taken for overhaul	Time taken for merging into stock	Time taken for Trials/ Revisia@
1	3518	08-09-08	11-02-10	27-05-11	17M	33 M	16M
2	3521	10-10-09	25-08-11	25-11-11	23M	25M	2M
3	3345	24-11-07	20-10-11	16-04-12	10M	53 M	43M
4	3828	24-11-08	09-12-09	01-11-12	13M	48 M	35M
5	3517	24-11-11	01-03-13	18-06-13	15M	19M	4M
6	3415	25-01-12	16-09-13	30-01-14	20M	24M	4M
7	3519	29-03-10	21-09-12	20-01-16	31M	70M	39M

*Source: Information provided by INS Eksila vide No.300/PPC/04(i) dated 21 Sep. 16*

@ Time taken between the completion of overhaul and merging into serviceable stock was considered as time period of trials/ revisia, instead of exact time period consumed for revisia as the total delay (including trial time and revisia time) was attributed to the defective workmanship during overhaul.

©  
**Comptroller & Auditor General of India**  
**2017**  
**[www.cag.gov.in](http://www.cag.gov.in)**